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Bid Receiving Public Works and Government
Services Canada/Réception des soumissions Travaux
publics et Services gouvernementaux Canada
1713 Bedford Row
Halifax, N.S./Halifax, (N.É.)
Halifax
Nova Scotia
B3J 1T3
Bid Fax: (902) 496-5016

Revision to a Request for a Standing Offer

Révision à une demande d'offre à commandes

Regional Individual Standing Offer (RISO)

Offre à commandes individuelle régionale (OCIR)

The referenced document is hereby revised; unless
otherwise indicated, all other terms and conditions of
the Offer remain the same.

Ce document est par la présente révisé; sauf
indication contraire, les modalités de l'offre demeurent
les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address

Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Atlantic Region Acquisitions/Région de l'Atlantique
Acquisitions
1713 Bedford Row
Halifax, N.S./Halifax, (N.É.)
Halifax
Nova Scot
B3J 1T3

Title - Sujet RISO - Hazardous Material Abatement OCIR - Élimination des matières dangereuses.		
Solicitation No. - N° de l'invitation W684H-220063/C		Date 2022-09-22
Client Reference No. - N° de référence du client W684H-22-0063		Amendment No. - N° modif. 001
File No. - N° de dossier HAL-1-87050 (410)	CCC No./N° CCC - FMS No./N° VME	
GETS Reference No. - N° de référence de SEAG PW-\$HAL-410-11579		
Date of Original Request for Standing Offer		2022-09-22
Date de la demande de l'offre à commandes originale		
Solicitation Closes - L'invitation prend fin at - à 02:00 PM Atlantic Daylight Saving Time ADT on - le 2022-10-18 Heure Avancée de l'Atlantique HAA		
Address Enquiries to: - Adresser toutes questions à: Assal, Mariam		Buyer Id - Id de l'acheteur hal410
Telephone No. - N° de téléphone (902) 233-0685 ()		FAX No. - N° de FAX (902) 496-5016
Delivery Required - Livraison exigée		
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:		
Security - Sécurité This revision does not change the security requirements of the Offer. Cette révision ne change pas les besoins en matière de sécurité de la présente offre.		

Instructions: See Herein

Instructions: Voir aux présentes

Acknowledgement copy required	Yes - Oui	No - Non
Accusé de réception requis	<input type="checkbox"/>	<input type="checkbox"/>
The Offeror hereby acknowledges this revision to its Offer. Le proposant constate, par la présente, cette révision à son offre.		
Signature	Date	
Name and title of person authorized to sign on behalf of offeror. (type or print) Nom et titre de la personne autorisée à signer au nom du proposant. (taper ou écrire en caractères d'imprimerie)		
For the Minister - Pour le Ministre		

Solicitation No. - N° de l'invitation
W684H-220063/C
Client Ref. No. - N° de réf. du client
W684H-22-0063

Amd. No. - N° de la modif.
001
File No. - N° du dossier
HAL-1-87050

Buyer ID - Id de l'acheteur
HAL410
CCC No./N° CCC - FMS No./N° VME

SOLICITATION AMENDMENT 001 IS RAISED TO:

1. Attach the Statement of Work to the RFSO

(see attached)

All other terms and conditions remain the same

Department of National Defence



Specification

Standing Offer Agreement

Hazardous Material Abatement for Halifax and Outlying Areas

CFB Halifax, NS

<u>Section</u>	<u>Title</u>	<u>Pages</u>
<u>Division 01 - General Requirements</u>		
01 11 00	General Instructions	11
01 35 30	Health and Safety Requirements	9
01 35 35	DND Fire Safety Requirements	5
01 35 36	Security, Safety and Fire Regulations CFAD Bedford, NS	7
01 35 37	Access to DRDC Atlantic Complex	1
01 35 73	Confined Spaces Requirements	10
<u>Division 02 - Existing Conditions</u>		
02 81 01	Hazardous Materials	6
02 82 00.01	Asbestos Abatement - Type I	11
02 82 00.02	Asbestos Abatement - Type II	17
02 82 00.03	Asbestos Abatement - Type III	28
02 83 10	Lead - Base Paint Abatement Type 1	11
02 83 11	Lead - Base Paint Abatement Type 2	15
02 83 12	Lead - Base Paint Abatement Type 3	17
02 84 00	Polychlorinate Biphenyl (PCB) Remediation	25
02 85 00.01	Remediation of Small Scale Mould Growth	10
02 85 00.02	Remediation of Medium Scale Mould Growth	11
02 85 00.03	Remediation of Large Scale Mould Growth	17

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 35 73 - Confined Spaces Requirements.
- .2 Section 02 81 01 - Hazardous Materials.
- .3 Section 02 82 00.01 - Asbestos Abatement - Type I.
- .4 Section 02 82 00.02 - Asbestos Abatement - Type II.
- .5 Section 02 82 00.03 - Asbestos Abatement - Type III.
- .6 Section 02 83 10 - Lead - Base Paint Abatement Type 1.
- .7 Section 02 83 11 - Lead - Base Paint Abatement Type 2.
- .8 Section 02 83 12 - Lead - Base Paint Abatement Type 3.
- .9 Section 02 84 00 - Polychlorinate Biphenyl Remediation.
- .10 Section 02 85 00.01 - Remediation of Small Scale Mould Growth.
- .11 Section 02 85 00.02 - Remediation of Medium Scale Mould Growth.
- .12 Section 02 85 00.03 - Remediation of Large Scale Mould Growth.

1.2 DESCRIPTION OF WORK

- .1 Work under this requirement comprises the furnishing of all labour, material, tools, equipment, transportation, and supervision required for the removal and disposal of various types of hazardous material including obtaining all necessary permits for transportation and disposal as specified herein.

1.3 DELIVERABLES

- .1 All deliverables associated with this Standing Offer Agreement must comply with all Government of Canada legislation, policies, and directives. These include, but are not limited to, the Official Languages Act, Canadian Labour Code, National Building Code of Canada, Defence Production Act, Government Contracting Regulations, and others.

1.4 DEPARTMENTAL
REPRESENTATIVE

- .1 All reference to the Departmental Representative in this specification, who is the Contract Inspector which is representing the Real Property Operations Section - Halifax (RPOS(H)).

1.5 WORK INCLUDED

- .1 Work included in this requirement includes but will not be limited to the following:
- .1 Conduct the following in accordance with the current federal, provincial and municipal regulations, legislations and standards:
- .1 Conduct the removal, cleaning and disposal of various types of hazardous and biohazardous materials such as but not limited to the following:
- .1 asbestos materials;
- .2 lead contaminated paint and materials;
- .3 mould;
- .4 polychlorinated biphenyl (PCBs);
- .5 excessive pest droppings, human waste, blood or vomit; and
- .6 any other hazardous material that can cause harm to health or environment.
- .2 Perform the construction and knock-down of enclosures required to safely conduct the removal of hazardous materials.
- .3 Conduct the transportation and disposal of all hazardous materials from the work site in accordance with the latest federal and provincial regulations regarding the pertinent substance.
- .2 Provide an emergency cleaning service available on a twenty-four (24) hour, seven (7) day per week basis.
- .3 Conduct clean up.

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- 1.6 WORK NOT INCLUDED .1 Air monitoring will be conducted by a testing agency approved by the Departmental Representative at no cost to the Contractor.
- 1.7 LOCATIONS OF JOB SITES .1 Work to be performed at sites throughout Nova Scotia, including but not limited to the following locations:
- .1 Halifax Regional Municipality (HRM):
- .1 Stadacona - Halifax, NS;
- .2 Windsor Park - Halifax, NS;
- .3 Willow Park - Halifax, NS;
- .4 Halifax Armoury - Halifax, NS;
- .5 Royal Artillery (RA) Park - Halifax, NS;
- .6 HMC Dockyard - Halifax, NS;
- .7 Damage Control Division - Herring Cove, NS;
- .8 Ferguson's Cove - Ferguson's Cove, NS;
- .9 12 Wing Shearwater - Eastern Passage, NS;
- .10 Osbourne Head Gunnery Range - Cow Bay, NS;
- .11 Naval Armament Depot (NAD) - Dartmouth, NS;
- .12 DRDC Atlantic - Dartmouth, NS;
- .13 Wright's Cove Degaussing Range - Dartmouth, NS;
- .14 CFAD Bedford - Bedford, NS;
- .15 Bedford Armoury - Bedford, NS; and
- .16 Bedford Rifle Range - Bedford, NS.
- .2 Outlying areas:
- .1 NRS Mill Cove - Mill Cove, NS;
-

1.7 LOCATIONS OF JOB
SITES
(Cont'd)

- .1 (Cont'd)
- .2 (Cont'd)
 - .2 NRS Newport Corner - Newport Corner, NS;
 - .3 Windsor Armoury - Windsor, NS;
 - .4 Truro Armoury - Truro, NS;
 - .5 Masstown Rx site - Masstown, NS;
 - .6 Great Village Tx site - Great Village, NS;
 - .7 Debert Rifle Range - Debert, NS;
 - .8 Springhill Armoury - Springhill, NS;
 - .9 Amherst Armoury and Rifle Range - Amherst, NS;
and
 - .10 Pictou Armoury - Pictou, NS.
- .3 Cape Breton area:
 - .1 Victoria Park - Sydney, NS;
 - .2 Sydney Rifle Range - Sydney, NS; and
 - .3 Glace Bay Armoury - Glace Bay, NS.

1.8 SITE ACCESS

- .1 Access to the site is under the direction of the Department of National Defence. All visitors entering areas issuing a daily pass will be aware of the requirement for search as a condition of issue.
- .2 While within the confines of CFB Halifax all employees and representatives of the Contractor must comply with all of the Standing Orders as promulgated by Base/Unit Authorities.

1.9 PRE-JOB MEETING

- .1 Immediately upon receipt of award of Standing Offer Agreement, the successful Contractor will contact the Departmental Representative to arrange a pre-job meeting prior to commencement of any work.

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- | | | |
|--|----|---|
| <u>1.9 PRE-JOB MEETING
(Cont'd)</u> | .2 | The Departmental Representative will provide the Contractor with a list of his/her authorized representatives at the pre-job meeting prior to commencement of any work. |
|
 | | |
| <u>1.10 WORKMANSHIP</u> | .1 | Workmanship must be the best quality executed by workers experienced and skilled in the respective duties for which they are employed. |
| | .2 | Do not employ any unfit person or anyone unskilled in their required duties. The Departmental Representative reserves the right to require the dismissal from the site, workers deemed incompetent, careless, or insubordinate. |
| | .3 | Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with the Departmental Representative whose decision is final. |
| | .4 | The Contractor will employ a competent and experienced supervisor with the authority to speak on his behalf on day-to-day routine matters. |
| | .5 | Whenever the Contractor uses subcontractors, they too must perform to and comply with all requirements. |
|
 | | |
| <u>1.11 NORMAL WORKING
HOURS</u> | .1 | Normal working hours will be 0730 to 1600 hours, Monday to Friday. Any work carried out other than normal working hours must be authorized by the Departmental Representative. |
|
 | | |
| <u>1.12 CONTRACTOR'S USE
OF SITE</u> | .1 | Contractor will be briefed on use of site by the Departmental Representative. |
| | .2 | Do not unreasonably encumber site with materials or equipment. |
| | .3 | Move stored products or equipment which interferes with operations of the Departmental Representative or other Contractors. |
| | .4 | The Departmental Representative will brief the Contractor on access to restricted areas. |
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1.13 PARKING

- .1 In limited areas, a parking space will be made available on site for Contractor vehicles to drop off equipment and supplies. Maintain and administer this space as directed.
- .2 The Contractor may have to pay for parking at the following locations:
 - .1 Stadacona - Halifax, NS;
 - .2 Windsor Park - Halifax, NS;
 - .3 Willow Park - Halifax, NS;
 - .4 Royal Artillery (RA) Park - Halifax, NS;
 - .5 Halifax Armoury - Halifax, NS; and
 - .6 HMC Dockyard - Halifax, NS.

1.14 CODES AND STANDARDS

- .1 Perform work in accordance with the latest edition of the National Building Code of Canada (NBC), Canadian Electrical Code Part I, Canada Labour Code Part II, National Fire Code of Canada, NS Fall Protection and Scaffold Regulations, DND/CF Asbestos management directives, and any other applicable federal, provincial and municipal regulations and by-laws. In any case of conflict or discrepancy, the more stringent requirements will apply.
- .2 Meet or exceed requirements of documents, specified standards, codes and referenced documents.

1.15 LICENSES AND PERMITS

- .1 The Contractor will be responsible for obtaining and paying for all licenses and permits required to perform the Work.

1.16 PROTECTION OF EXISTING FACILITIES

- .1 The Contractor must take all necessary precautions to ensure against damage to existing facilities. Any damage to such facilities as a result of the Contractors operations must be repaired or replaced by the Contractor at his/her own expense, as soon as is reasonably possible.
- .2 Special coverings and protection must be provided to protect plants, walls, projections and adjacent work where materials are being removed, installed or hoisted.

1.16 PROTECTION OF
EXISTING FACILITIES
(Cont'd)

- .3 The Contractor must protect all occupant owned furnishings and equipment, and the building from damage during execution of this requirement.
- .4 Where the Departmental Representative considers it necessary, provide and erect warning signs and barriers.

1.17 ALTERATIONS,
ADDITIONS OR REPAIRS
TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to building operations, occupants, public and normal use of premises. Arrange with the Departmental Representative to facilitate execution of work.
- .2 Where security has been reduced by work of Standing offer Agreement, provide temporary means to maintain security.
- .3 Provide temporary dust control, barriers, warning signs in locations where renovation and alteration work is adjacent to areas used by public or government staff.
- .4 Use only elevators existing in building for moving workers and material.
 - .1 Protect walls of passenger elevators, to approval of the Departmental Representative prior to use.
 - .2 Accept liability for damage, safety of equipment and overloading of existing equipment.

1.18 EXISTING SERVICES

- .1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give 24 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to tenant operations.
- .3 Provide alternate routes for personnel, pedestrians and vehicular traffic.

1.18 EXISTING SERVICES
(Cont'd)

- .4 Submit schedule to and obtain approval from the Departmental Representative for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .5 Provide temporary services when directed by the Departmental Representative to maintain critical building and tenant systems.
- .6 Where unknown services are encountered, immediately advise the Departmental Representative and confirm findings in writing.

1.19 CUTTING, FITTING
AND PATCHING

- .1 Execute cutting, fitting and patching required to make work fit properly.
- .2 Where new work connects with existing and where existing work is altered, or cut, patch and make good to match.
- .3 Obtain the Departmental Representative's approval before cutting, boring or sleeving load-bearing members.
- .4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

1.20 POWER AND WATER
SUPPLY

- .1 DND may provide, free of charge, temporary electric power and water for construction purposes.
- .2 The Departmental Representative will determine delivery points and quantitative limits. The Departmental Representative's written permission is required before any connection is made. Connect to existing power supply in accordance with Canadian Electrical Code.
- .3 Provide, at no cost to DND, all equipment and temporary lines to bring these services to project site.
- .4 Supply of temporary services by DND is subject to DND requirements and may be discontinued by DND site representative at any time without notice, without acceptance of any liability for damage or delay caused by such withdrawal of temporary services.
- .5 After the temporary service lines are no longer required, the Contractor must remove all lines and equipment, restore the connection points to their original condition and return the land to its original contour.

1.21 HEATING AND
VENTILATING

- .1 Provide temporary heat and ventilation as required to:
 - .1 facilitate progress of work;
 - .2 protect work and products against dampness and cold;
 - .3 prevent moisture condensation on surfaces;
 - .4 provide ambient temperatures and humidity levels for storage, installation and curing of materials; and
 - .5 provide adequate ventilation to meet health regulations for safe working environment.
- .2 Maintaining strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 conform with applicable codes and standards;
 - .2 enforce safe practices;
 - .3 prevent abuse of services;
 - .4 prevent damage to finishes; and
 - .5 vent direct-fired combustion units to outside.

1.22 EMERGENCY AND
SERVICE CALL-UPS

- .1 The Contractor must maintain and provide the Departmental Representative with contact numbers to be able to provide response to request for service from the Departmental Representative or representative on a 24 hours, 7 days per week basis. If the request for service from the after hours representative, the Contractor must, immediately upon completion of the service, report back to the Departmental Representative describing the action taken to correct the problem. The following Work priorities and response time will apply:
 - .1 Emergency:

1.22 EMERGENCY AND
SERVICE CALL-UPS
(Cont'd)

- .1 (Cont'd)
 - .1 (Cont'd)
 - .1 A priority of "Emergency" is defined as a deficiency or breakdown that requires immediate attention to reduce the potential for danger to occupants, the general public, the environment, or the facility. Maintenance and repairs identified with this priority must be responded to immediately and must be reported without delay to designated manager.
 - .1 Standard response times:
 - .1 Urban/rural: ASAP - 2 hours.
 - .2 Routine:
 - .1 A priority of "Routine" is defined as essential maintenance and repairs which should be rectified at the earliest possible opportunity. It is considered as deficiencies or breakdowns that do not impair current operations or pose any danger to the occupants, the general public, the environment, or the facility.
 - .1 Standard response times:
 - .1 Urban/rural: 4 hours.
 - .2 The Contractor will be advised of the personnel authorized to request emergency service. Services undertaken at the request of unauthorized persons will be done at the Contractor's risk, with regards to payment.
 - .3 Report service calls executed outside normal working hours to the Departmental Representative, immediately on the next working day.

1.23 INSPECTION

- .1 All work and materials covered by this specification will be subject to inspection at any time by the Departmental Representative or his/her representative.

<u>1.24 REPORTING IRREGULARITIES</u>	.1	The Contractor must notify the Departmental Representative of irregularities in the work area, such as accidents, spills, structural defects, mechanical and/or electrical problems and/or any beyond the scope of work.
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PART 2 - PRODUCTS

<u>2.1 NOT USED</u>	.1	Not used.
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PART 3 - EXECUTION

<u>3.1 NOT USE</u>	.1	Not used.
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PART 1 - GENERAL

1.1 WORK SAFETY
MEASURES

- .1 Observe and enforce construction safety measures by complying with the requirements of the following statutes and authorities:
 - .1 Canada Labour Code Part II and the Canada Occupational Health and Safety Regulations.
 - .2 Nova Scotia Occupational Health and Safety Act and supporting Occupational General Safety Regulations as amended from time to time.
 - .3 Most recent amendments to the National Building Code of Canada, Part 8 and National Fire Code of Canada.
 - .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
- .2 Refer to Section 01 35 35 - DND Fire Safety Requirements.
- .3 Departmental Representative will provide a copy of any relevant special written instructions to be followed.
- .4 Before Work Begins:
 - .1 Bidder/Tender to provide documentation if requested by the Crown, indicating all safety training attained for each person who will be involved with the requirements.
- .5 The following disciplinary measures will be taken for any violations of safety under this requirement:
 - .1 First Violation:
 - .1 Verbal warning issued to the Contractor for the first violation of a safety regulation (Violation will be documented on Standing Offer file, copy to Contractor and PSPC.).
 - .2 Second Violation:

1.1 WORK SAFETY
MEASURES
(Cont'd)

.5

(Cont'd)

.2 (Cont'd)

.1 Written warning to Contractor for second violation of a safety regulation (Violation will be documented on Standing Offer file, copy to Contractor and PSPC.).

.3 Third Violation:

.1 A third violation of a safety regulation may result in the termination of the Standing Offer.

.4 Serious Violation:

.1 For a serious violation of a safety regulation as deemed by a regulator, project manager or safety officer a recommendation will be made to the Contracting Authority to immediately terminate the Contract/Standing Offer (Violation documented on Standing Offer file, copy to Contractor and PSPC.).

1.2 HAZARD ASSESSMENTS

.1

Contractor must implement and carry out a health and safety hazard assessment program as part of the Work. Program to include:

.1 Initial Hazard Assessment:

.1 Carried out upon notification of Contract award and/or prior to commencement of Work.

.2 On-going Hazard Assessments:

.1 Performed during the progress of Work identifying new or potential health risks and safety hazards not previously known. As a minimum, hazards assessments must be carried out when:

.1 new sub-trade work, new sub-contractor(s) or new workers arrive at the site to commence another portion of the Work;

.2 the scope of Work has been changed;

.3 Work conducted in confined spaces; and/or

1.2 HAZARD ASSESSMENTS
(Cont'd)

- .1 (Cont'd)
- .2 (Cont'd)
- .4 potential hazard or weakness in current health and safety practices are identified by the Departmental Representative.
- .2 Hazard assessments will be project and site specific, based on review of documents and site.
- .3 Each hazard assessment to be made in writing. Keep copies of all assessments on site for duration of Work. Upon request, make available to the Departmental Representative.
- .4 The Contractor must notify the Departmental Representative of suspected hazardous material during work and not apparent from drawings, specifications, or report pertaining to work (e.g. lead, asbestos etc.). Do not disturb such material pending instructions from the Departmental Representative. The Departmental Representative will make the necessary arrangements for testing the material as required.

1.3 ASBESTOS PRODUCT &
ASBESTOS ACTIVITY

- .1 Within the confines of the Base/Unit, the provision of new products containing fibrous asbestos materials is prohibited.
- .2 Demolition or disturbance of spray or trowel-applied asbestos can be hazardous to health. Should material resembling spray or trowel-applied asbestos be encountered in course of work, stop work and notify the Departmental Representative immediately. Do not proceed until written instructions have been received from the Departmental Representative.

1.4 HAZARDOUS MATERIAL
SPILL

- .1 The Contractor or sub-contractors must report to the DND Fire Department and the Departmental Representative for any incident or spill involving hazardous materials (HAZMAT).
- .2 In the event of a hazardous material spill, the following procedures for initial actions must be followed:
 - .1 ensure safety of all personnel;
 - .2 assess spill hazards and risks;

1.4 HAZARDOUS MATERIAL
SPILL
(Cont'd)

- .2 (Cont'd)
- .3 ventilate area if release is indoors and remove all sources of ignition;
- .4 stop the spill if safely possible (e.g. shut off pump, replace cap, tip drum upward, patch leaking hole etc.).
- .5 no matter the volume is, contact the DND Fire Department and provide the following information:
- .1 time of the spill;
- .2 location;
- .3 special considerations:
- .1 personal safety;
- .2 environmental.
- .4 type and amount of spill;
- .5 person reporting the spill:
- .1 name;
- .2 company; and
- .3 telephone number.
- .6 contain the spill;
- .7 isolate the area as required;
- .8 provide Material Safety Data Sheets (MSDS) to DND Fire Department and the Departmental Representative;
- .9 contact the Departmental Representative; and
- .10 clean up minor spills using appropriate protective equipment and supplies.

1.5 FASTENING DEVICES
EXPLOSIVE ACTUATED

- .1 Explosive actuated devices must not be used without the approval of the Departmental Representative.
- .2 Operator must have the appropriate training before using the explosive actuated device.
- .3 Follow the manufacturer's safety guidelines and ensure the applicable personal protective equipment is used.

1.6 HOT WORK

- .1 All hot work activity is to take place with the Departmental Representative's approval and written permission from the DND Fire Department (hot work permit). Hot work permits and fire watch requirements will be provided by the DND Fire Department.
- .2 The ventilation system in the area of any hot work is to be isolated to prevent migration of fumes/smoke and to reduce any possible spread of fire to other areas of the facility.
- .3 Contractor is to employ an employee trained in the use of fire extinguishers as fire watch during any hot work for a minimum of 30 minutes after activity has ceased.

1.7 CONFINED SPACES

- .1 All work in confined spaces will be carried out in compliance with the Canada Occupational Safety and Health Regulations, Part XI.
- .2 The Contractor to provide and maintain all equipment as required by any person to enter and/or perform work in a safe manner, in compliance with the Canada Occupational Safety and Health Regulations, Part XI.
- .3 The Contractor to provide and maintain training, as required by the Canada Occupational Safety and Health Regulations, Part XI.
 - .1 The personnel entering and working in confined spaces must have at all times valid certifications when working in confined spaces. The employees must provide proof of training and qualifications when requested by the Departmental Representative or the Unit Safety Officer.
- .4 The Contractor to provide the Departmental Representative with a copy of an "entry permit" for each and every entry into the confined space to ensure compliance with the Canada Occupational Safety and Health Regulations, Part XI.

1.7 CONFINED SPACES
(Cont'd)

- .5 The Contractor to have a hazard assessment of the confined space performed.
 - .1 The Contractor to provide the Departmental Representative with a copy of the hazard assessment.
- .6 The Contractor must have a written rescue plan posted on site.
- .7 Contractor must inform DND Fire Department and Central Heating plant before entering any service tunnel.

1.8 FALL PROTECTION

- .1 All work carried out above the mandatory height restrictions, from unguarded structure and/or scaffolding, will be done in compliance with the Canada Occupational Safety and Health Regulations, Part XII, Section 12.10.
- .2 The components of a fall protection system must meet the standards as outlined in the Canada Occupational Safety and Health Regulations, Part XII, Section 12.10 (2).
- .3 The Contractor is to ensure fall protection equipment is maintained, inspected and tested by a qualified technician as required by the Canada Occupational Safety and Health Regulations, Part XII, Section 12.3.

1.9 ARC FLASH

- .1 The Contractor is to ensure all electrical equipment such as switchboards, panel boards, motor control centres and meter socket enclosures be marked to warn persons of potential electric shock and arc flash hazards. This labeling is required for all new and modified installations.
- .2 The warning label must also include information regarding "arc flash hazard category (0 to 4)" and the "Flash Protection Boundary" as defined in NFPA 70E. All projects specifications must include short circuit study and flash hazard analysis.

1.9 ARC FLASH
(Cont'd)

- .3 In accordance with the CSA Standards Z462 Workplace Electrical Safety, electrical Contractors are required to perform a shock and flash hazard analysis to select the appropriate PPE to wear. Electrical contractors are required arc-rated personal protective equipment while troubleshooting and diagnostic testing that cannot be performed unless the electrical conductor or circuit part is energized. All Contractor work practices must protect each employee from arc flash and from contact with live parts directly with any part of the body or indirectly through some other conductive object.

1.10 SAFETY

- .1 It is the Contractor's responsibility to be familiar with all applicable safety acts, regulations, codes and requirements. These must be identified and addressed in the safety plan, by identifying Standard Operating Procedures (SOP) and safe work practices (SWP) which incorporate clear and specific control measures, applicable rules, procedures and practices, all of which will become mandatory.
- .2 The Contractor must ensure all workers and authorized persons entering the work site are notified of and abide by the posted safety plan, safety rules, procedures, safe work practices and applicable safety acts, regulations, and codes. Any person not complying with these will not be permitted on the site.
- .3 Contractor must ensure that all applicable personal protective equipment (PPE) is used.
- .1 All personnel are required to wear hard hats, in accordance with CSA Z94.1, Industrial Protective Headwear.
- .2 All personnel are required to wear safety footwear, in accordance with CSA Z195, Protective Footwear.
- .3 All personnel are required to wear eye and face protection, in accordance with CSA Z94.3.1, Selection, Use, and Care of Protective Eyewear.
- .4 When and where noise level is above 85 decibels; all personnel are required to wear hearing protection, in accordance with CSA Z94.2, Hearing Protection Devices - Performance, Selection, Care and Use.

1.10 SAFETY (Cont'd)	.3	(Cont'd)
	.5	Where toxic or noxious gas fumes, or oxygen deficiency or excessive dust may occur, so as to create a hazard to life, safety or health; all personnel are required to wear respiratory protection, in accordance with CAN/CSA Z94.4, Selection, Use, and Care of Respirators.
	.4	The Departmental Representative will coordinate arrangements for the Contractor to be briefed on site safety within 14 days of award of Standing Offer Agreement.
1.11 SECURITY	.1	Security incident can be defined as any fact or event which could affect your personal or organizational security.
	.2	When performing Work on the premises of CFB Halifax, security incidents or threats could occur at any time such as bomb threats, active intruder, lockdowns etc.
	.3	When a security incident occurs, the Contractor shall:
	.1	stop the work safely;
	.2	account for all your personnel in a secure area;
	.3	report to the building main office or facility manager for further directives; and
	.4	contact the Departmental Representative.
1.12 SITE SIGNS AND NOTICES	.1	Safety and instruction signs and notices:
	.1	Signs and notices for safety and instruction must be in both official languages. Graphic symbols must conform to latest version of "Signs and Symbols for the Workplace".
PART 2 - PRODUCTS		
2.1 NOT USED	.1	Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

1.1 EMERGENCY
REPORTING

- .1 Telephone numbers for emergency reporting will be provided by the Departmental Representative at the fire safety briefing.

1.2 FIRE SAFETY
ENFORCEMENT

- .1 Within the confines the Base/Unit, the prescription and enforcement of mandatory fire safety measures will be exercised under the authority of the DND Fire Department.
- .2 Comply with and enforce compliance by all Contractor personnel with all requirements of this specification section, and with the most recent edition of the National Building Code of Canada (NBC) and the National Fire Code of Canada (NFC), including all subsequent revisions issued by the National Research Council of Canada.

1.3 FIRE SAFETY BRIEFING

- .1 Prior to commencement of work under this requirement, the Departmental Representative will arrange a meeting of all parties concerned to review and clarify requirements for fire safety measures. This may involve a briefing by the DND Fire Department.

1.4 FIRE WATCH

- .1 For hot work activity, the Contractor will provide the service of fire-watch persons on a scale and schedule as prescribed by the DND Fire Department at the time of issuance of the hot work permit.

1.5 FIRE EXTINGUISHERS

- .1 The Contractor will supply fire extinguishers, as scaled by the DND Fire Department, necessary to protect work in progress and Contractor's physical plant on site.

1.6 SMOKING
PRECAUTIONS

- .1 Smoking not permitted on DND property except in designated smoking areas. This includes smoking in passenger motor vehicles.
- .2 In accordance with these fire safety requirements particular to the work area and site, the Departmental Representative and DND Fire Department will designate hazardous areas as well as non-restricted areas where smoking may be permitted.
- .3 Smoking is prohibited in all buildings.

1.6 SMOKING
PRECAUTIONS
(Cont'd)

- .4 In all other areas, exercise care and comply with written or oral directives of the Departmental Representative for the use of smoking materials.

1.7 REPORTING FIRES

- .1 Report immediately all fire incidents as follows:
- .1 activate nearest fire alarm box; or
 - .2 dial 9-1-1 or designated number given at the time of briefing; and
 - .3 telephone the Departmental Representative.
- .2 Person activating fire alarm must remain at the alarm to direct the Fire Department to the scene of the fire.
- .3 When reporting fire by telephone, give location of fire, name and number of building and be prepared to direct the Fire Department to the scene of the fire.

1.8 INTERIOR AND
EXTERIOR FIRE
PROTECTION AND
ALARM SYSTEMS

- .1 Notify DND Fire Department at least 48 hours prior to scheduling any work that may require fire alarm and/or protection systems to be:
- .1 obstructed in any way;
 - .2 shut-off; and/or
 - .3 left inactive at end of working day or shift without authorization from DND Fire Department.
- .2 Do not commence any such work until Departmental Representative confirms approval and direction by the DND Fire Department.
- .3 Fire hydrants, standpipes and hose systems will not be used for other than fire fighting purposes unless authorized by the Departmental Representative and the DND Fire Department.

1.9 BLOCKAGE OF ACCESS
FOR FIRE APPARATUS

- .1 Advise DND Fire Department of work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by the DND Fire Department, erecting of barricades and digging of trenches.

1.10 RUBBISH AND WASTE
MATERIALS

- .1 Keep rubbish and waste materials to a minimum.
- .2 Burning of rubbish is prohibited.
- .3 Remove rubbish from work site at end of work day or shift or as directed by the Departmental Representative.
- .4 Storage:
 - .1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
 - .2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles approved by the DND Fire Department and remove as directed by the Departmental Representative.

1.11 FLAMMABLE AND
COMBUSTIBLE LIQUIDS

- .1 Handle, store and use of flammable and combustible liquids in accordance with National Fire Code of Canada and as otherwise directed by the DND Fire Department.
- .2 Store flammable and combustible liquids such as gasoline, kerosene and naphtha in quantities not exceeding 30 litres. Store in approved safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual seal of approval. Obtain written authorization from DND Fire Department for storage of quantities of flammable and combustible liquids exceeding 30 litres.
- .3 The Departmental Representative reserves the right to require removal from the site any storage containers not acceptable to the DND Fire Department.
- .4 Transfer of flammable and combustible liquids within buildings or on jetties is prohibited.
- .5 Transfer of flammable and combustible liquids in vicinity of open flames or any type of heat producing devices is prohibited.

1.11 FLAMMABLE AND
COMBUSTIBLE LIQUIDS
(Cont'd)

- .6 Use of flammable liquids having flash point below 38 degrees C such as naphtha or gasoline as solvents or cleaning agents is prohibited.
- .7 Storing flammable and combustible waste liquids, for disposal, in approved containers located in safe ventilated area. Keep quantities minimum and DND Fire Department is to be notified when disposal is required.

1.12 HAZARDOUS
SUBSTANCES

- .1 Work entailing use of toxic or hazardous materials, chemicals and/or explosives, or otherwise creating hazard to life, safety or health, in accordance with National Fire Code of Canada, and measures prescribed by the DND Fire Department.
- .2 Obtain from DND Fire Department a "hot work" permit for work involving welding, burning or use of blowtorches and salamanders, in buildings or facilities.
- .3 When Work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with level of protection necessary for fire watch is at discretion of the DND Fire Department. Contractors are responsible for providing fire watch service for work on scale established and in conjunction with the DND Fire Department at pre-work conference.
- .4 Provide ventilation where flammable liquids, such as lacquers or urethanes are used, eliminate sources of ignition. Inform DND Fire Department prior to and at cessation of such work.

1.13 FIRE INSPECTION

- .1 Co-ordinate site inspections by DND Fire Department through the Departmental Representative.
- .2 Allow DND Fire Department unrestricted access to work site.
- .3 Co-operate with DND Fire Department during routine fire safety inspection of work site.
- .4 Immediately remedy unsafe fire situations observed by DND Fire Department.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

1.1 GENERAL

- .1 The Contractor must ensure that all their personnel are familiar with these regulations and requirements.
- .2 The following is a summary the security, safety and fire regulations Canadian Forces Ammunition Depot (CFAD) Bedford, as promulgated by the Base Commander of CFB Halifax and administered by the Superintendent CFAD Bedford, NS.
- .3 Contractor's personnel will be subject to all of the regulations while working within confines of CFAD Bedford.

1.2 PRE JOB SECURITY AND SAFETY MEETING

- .1 Prior to commencement of Work, the Contractor must meet with the site security, safety and fire regulations officers. In accordance with direction of the Departmental Representative and these site officers, ensure that all employees of the Contractor are given thorough instructions on security, safety and fire precautions peculiar to an ammunition depot and that the regulations are fully compiled with, at all times, by all Contractor personnel.

1.3 SECURITY PASSES

- .1 Contractors must report to the NCO I/C Commissionaires at building 153; submit names of all their personnel and description of all their vehicles to arrange the issue of the required temporary passes prior to proceeding to work within the confines of the Depot.

1.4 CONDITIONS FOR ACCESS

- .1 All visitors will be issued a daily and will be required to sign acknowledgement that they are aware of and consent to the following conditions for access.
- .2 The person to whom this pass is issued agrees to return the pass to the security guard at the gate when the Contract or employment at CFAD Bedford expires.
- .3 All vehicles entering and leaving CFAD Bedford may be searched to ensure that no prohibited articles are taken into nor contraband articles are taken out of the ammunition depot.

1.5 FIRE SERVICE CFAD
BEDFORD

- .1 Fire service at CFAD Bedford is provided by the DND Fire Service from 0730 until 1600 hours, Monday to Friday. All Contract work will be ended by 1530 hours daily. Fire response at all other times is provided by HRM. Before any work is carried out during silent hours, the Dockyard Platoon Chief must be contacted at 427-0550, local 3500.

1.6 SEARCHES

- .1 The Canadian Corps of Commissionaires may conduct a personal search of individuals at any time within the Ammunition Depot. Vehicles entering or leaving the Depot may be searched to ensure that contraband articles are not taken into the explosives area and that property is not taken out without authorization.

1.7 ALARMS

- .1 Depot Alarms:
- .1 A siren is sounded only in the event of an emergency such as a fire, explosion, thunderstorm or evacuation. A siren is also sounded to signify "All Clear".
- .2 Fire Emergency:
- .1 A series of "Hi-Lo" sounds on the Depot alarm system signifies an emergency in the explosive area. Contractors must cease operations and proceed in their own vehicles to the nearest exit gate out of the explosive area. If no vehicle available proceed to the nearest "Fire Assembly Point" at buildings 169 or 143.
- .3 Thunder and Lightning:
- .1 A series of "Beeps" on the Depot alarm system signifies a thunder/lightning storm warning. Contractors must cease operations and proceed in their own vehicles to the nearest exit gate out of the explosive area. If no vehicle available proceed to the nearest "Fire Assembly Point" at buildings 169 or 143.
- .4 Evacuation:

1.7 ALARMS

(Cont'd)

- .4 (Cont'd)
 - .1 A series of "Slow Whoops" on the Depot alarm system signifies that evacuation in the explosive area has been ordered by the Superintendent. The evacuation could be extended to include the non-explosive area as well as so ordered by the Superintendent.
- .5 All Clear:
 - .1 A continuous blast on the Depot alarm system signifies that the emergency situation is "All Clear".

1.8 REPORTING OF FIRES

- .1 All fires, regardless of whether they have been extinguished or not, must be reported immediately to the DND Fire Department.
- .2 All Contractors and employees must familiarize themselves with the locations of the nearest fire alarm box or telephone.
- .3 Fires may be reported by ringing the nearest street alarm box or by telephoning 9-1-1. Persons reporting the fire must remain at the alarm box or telephone until the Fire Department arrives and be prepared to direct fire fighters to the scene of the fire.

1.9 PROHIBITED ARTICLES

- .1 The following articles are prohibited and/or controlled from being taken inside the explosive area. Permission by the Superintendent may be granted for certain articles:
 - .1 matches or other flame producing equipment (including vehicle lighters);
 - .2 pipes, smoking appliances, tobacco products, or smoking materials in any form;
 - .3 explosives or chemicals;
 - .4 lights, lamps or electrical devices/tools which are not explosion proof;
 - .5 cameras;
 - .6 food and drink; and

1.9 PROHIBITED ARTICLES
(Cont'd)

- .1 (Cont'd)
- .7 radio transmitting devices (i.e. mobile radios, cellular phone phones, remote car starters, and garage door openers, etc).
- .2 No persons will introduce, possess or consume alcoholic beverages, narcotics or any intoxicant within the confines of the Ammunition Depot.
- .3 The site security officers will seize and hold at the gate, any such materials found by search.

1.10 SAFETY AND FIRE
REGULATIONS

- .1 Smoking:
 - .1 Is strictly prohibited in explosive areas.
- .2 Buildings:
 - .1 Smoking is prohibited in all buildings.
- .3 Safety Precautions Electrical/Electronic Equipment:
 - .1 All personnel operating or maintaining electrical/electronic equipment involving the use of voltage higher than 50 V must brief the site safety and fire safety officers concerning all safety rules in the operating and instructional manuals covering the equipment.
- .4 Flammables, Explosives or Chemicals:
 - .1 As required, may be allowed into the explosive area provided that the Depot Safety Officer and the Depot Fire Department are made aware of this and that approval by the Superintendent is given. These items after approval may be transported by the Contractors provided the transportation route is known by the Depot Fire Department and adequate fire extinguishers are available.
- .5 Open Flame or Welding:

1.10 SAFETY AND FIRE
REGULATIONS
(Cont'd)

- .5 (Cont'd)
 - .1 Prior approval must be obtained before commencing any work involving cutting, welding or use of open flame appliances in or around buildings containing explosives. The Fire Safety Officer will check out the work area and ensure that adequate fire extinguishers and first aid appliances are available and that fire watchers have been posted.
- .6 Fuel Dispensing Containers:
 - .1 Contractors must ensure that all of their fuel dispensing containers meet or exceed the following standards:
 - .1 type II safety container, leakproof, Terne plate construction, UL listed and FM approved;
 - .2 container must have spring-operated spout cap which opens to allow vapours to escape and self closes on release of internal pressures;
 - .3 container must have flexible or rigid built-in metal dispensing nozzle to prevent static sparks;
 - .4 standard of Acceptance: Protectoseal, model nos. 247, 249, 8410 and 8420;
 - .5 other acceptable products: Safe-T-Way; and
 - .6 any other model must be approved by the BFC.
 - .7 Violation of any of the above regulations will result in immediate cancellation of the offender's security pass and expulsion from the site.

1.11 TRAFFIC REGULATIONS

- .1 Vehicles:
 - .1 All operators must adhere strictly to the following rules while proceeding through the Ammunition Depot:
 - .1 drivers must not leave the motors of their vehicles running or leave the vehicles unattended when parked between buildings or traverses;

1.11 TRAFFIC REGULATIONS
(Cont'd)

- .1 (Cont'd)
 - .1 (Cont'd)
 - .2 drivers must not drive vehicles in the direction opposite to that indicated by the "One-way" signs;
 - .3 no one will operate a vehicle within the Depot area at a speed greater than 25 kilometres per hour at any time;
 - .4 no one will operate a vehicle within the Depot area at a speed greater than 8 kilometres per hour at any time, while passing between blast walls and buildings;
 - .5 no one will leave a vehicle unattended within 10 metres of a fire hydrant or within 30 metres of a building containing explosives; and
 - .6 all vehicles must be equipped with a fire extinguisher of a suitable size and type so that it may be used to extinguish any fire originating in that vehicle.
 - .2 Violation of any of the above regulations will result in immediate cancellation of the offender's vehicle pass and expulsion from the site.
- .2 Roadways:
 - .1 In the event of a fire or emergency all roads and buildings within CFAD Bedford must be accessible at all times. Contractors required to disrupt roadways during the course of their work, must ensure that at least one lane of each roadway is passable, at all times. Vehicles not required to transport personnel to the nearest exit gate must be parked on the side of the road and away from the nearest building.
- .3 Fueling:

1.11 TRAFFIC REGULATIONS
(Cont'd)

- .3 (Cont'd)
- .1 Fueling of vehicles within the explosive areas is prohibited. Small equipment (lawn mowers, chainsaws, etc.) may be re-fueled, but only at sites designated by the Safety Officer and Fire Safety Officer. Comply with all safety practices pertaining to re-fueling hot equipment. Provide adequate fire extinguishers of types prescribed by the Fire Safety Officer. Only approved safety dispensing containers, as specified at sub-paragraph 1.10.6, will be permitted within the confines of the Ammunition Depot.
- .4 Violation of any of the above regulations will result in immediate cancellation of the vehicle pass and expulsion of the offender from the site.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not used.

PART 1 - GENERAL

1.1 SITE ACCESS .1 Contractor's personnel are required to report to the main desk each morning, sign the register and obtain an identification badge which must be displayed on their person at all times. Upon leaving the Complex at the end of the day, or at lunch time, the Contractor's personnel must report to the main desk, return the badge and be signed off the register.

1.2 PARKING .1 Contractor's vehicles will be allowed into the inner compound only under the following conditions; namely, for short periods of time, to load or unload equipment and supplies and then remove to the upper parking lot adjacent to Windmill Road or to the street. The site supervisor of the contracting firm will be allowed to park his/her vehicle, for short periods of time, in one of the visitor's parking slots or, if filled, he/she will be permitted to park in the inner compound while making periodic progress visits. It is emphasized that contractors' vehicles entering the inner compound can be subject to search by the Commissionaire on duty upon their departure. DRDC Atlantic reserves the right to limit the above-mentioned parking privileges if they are being abused.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - General Instructions.
- .2 Section 02 81 01 - Hazardous Materials.
- .3 Section 02 82 00.01 - Asbestos Abatement - Type I.
- .4 Section 02 82 00.02 - Asbestos Abatement - Type II.
- .5 Section 02 82 00.03 - Asbestos Abatement - Type III.
- .6 Section 02 83 10 - Lead - Base Paint Abatement Type 1.
- .7 Section 02 83 11 - Lead - Base Paint Abatement Type 2.
- .8 Section 02 83 12 - Lead - Base Paint Abatement Type 3.
- .9 Section 02 84 00 - Polychlorinate Biphenyl Remediation.
- .10 Section 02 85 00.01 - Remediation of Small Scale Mould Growth.
- .11 Section 02 85 00.02 - Remediation of Medium Scale Mould Growth.
- .12 Section 02 85 00.03 - Remediation of Large Scale Mould Growth.

1.2 REFERENCES

- .1 Canada Occupational Health and Safety Regulations, Part XI (latest edition including all amendments).
- .2 CSA Z1006 Management of work in confined spaces.
- .3 American Conference of Governmental Industrial Hygienists publication "Threshold Limit Values For Chemical Substances and Physical Agents and Biological Indices" (latest edition including all amendments).

1.3 DESCRIPTION

- .1 This section outlines the mandatory regulations which must be followed to ensure safe operations in and around potentially hazardous confined spaces and the emergency procedures that are to be followed.

1.3 DESCRIPTION
(Cont'd)

- .2 The safety standards in this section are applicable to contractors and consultants, their employees (including subcontractors), materials, works and buildings throughout CFB Halifax.
- .3 All personnel entering a confined space, acting as an observer, or as a rescuer will be thoroughly trained in all procedures in accordance with above reference, No.1.
- .4 The Contractor will be responsible for and ensure compliance with the provisions of this Section and of the Standards in above reference, No.1.

1.4 RESTRICTIONS

- .1 No contractor, subcontractor, consultant, or their employee will:
 - .1 Be permitted to enter a hazardous confined space without receiving an evaluation, written in language which is understood by the employee/Contractor, concerning the level of hazard in the confined space. Entry must be made in compliance with this Section and with the requirements in reference, No.1.
 - .2 Enter a hazardous confined space without a safe entry permit posted at the site of work and a copy on file.

1.5 DEFINITIONS

- .1 For the purpose of this section the following definitions will apply:
 - .1 Confined space:
 - .1 A tank, process vessel, underground vault, tunnel or other enclosure not designed or intended for human occupancy, except for the purpose of performing work:
 - .1 that has limited number of openings for entry and exit;
 - .2 that has poor natural ventilation;
 - .3 in which there may be an oxygen deficient atmosphere; or
 - .4 in which there may be an airborne dangerous substance.

1.5 DEFINITIONS

(Cont'd)

.1 (Cont'd)

.1 (Cont'd)

.2 Dangerous substance:

.1 A hazardous substance or a chemical, physical or biological agent that, because of a property it possesses, is hazardous to the safety or health of a person exposed to it.

.3 Qualified person:

.1 In respect to a specified duty, a person who, because of their knowledge, training and experience is qualified to perform that duty safely and properly.

.4 Class of confined space:

.1 A group of at least two confined spaces that are likely, by reason of their similarity, to present the same hazards to persons entering, exiting or occupying them. Confined spaces are identified as Class A, B, or C by DND depending on hazard assessment.

.1 Class A - Hazardous confined space:

.1 Any confined space that cannot be made safe by ventilation and maintained in this safe condition even when lock-out, blank and bleed, and all other actions have been taken.

.2 Class B - Confined space:

.1 Hazards exist but can be eliminated by ventilation, lock-out, and blank and bleed.

.3 Class C - Considered confined space:

.1 Conditions could arise to make the area a confined space.

1.6 COMMON HAZARDS

- .1 Hazards common to confined spaces that Contractors must watch for are:
 - .1 toxic vapours from sludge or leakage into the space;
 - .2 flammable gases and vapours with potential fire or explosion hazards;
 - .3 oxygen below 19.5 % or over 23 % (normal 20.9 %);
 - .4 electric shock from tools, lights or other electrical equipment;
 - .5 chemical burns from corrosives or injury from dermatitis producing materials;
 - .6 burns from high pressure steam, hot water or fuel oil;
 - .7 high pressure air;
 - .8 physical hazards from slips, falls, protruding objects or falling objects; and
 - .9 excess corrosion on metal components.

1.7 SAFE ENTRY PERMIT

- .1 Where the Contractor must enter a confined space, a safe entry permit must be provided to the Departmental Representative, completed in triplicate and returned to the Departmental Representative before access will be permitted. One copy must be posted at site of work. Original copy must be sent to the Unit General Safety Officer.

1.8 VERIFICATIONS

- .1 Prior to entering a confined space the Contractor must provide a qualified person to ensure/verify:
 - .1 That there are openings for entry and exit from the confined space of sufficient size to allow the safe passage of a person using protective equipment. This opening can be:
 - .1 a manhole; or
 - .2 other clear opening.

1.8 VERIFICATIONS
(Cont'd)

- .1 (Cont'd)
- .2 That the entry of any liquid or free flowing solid or hazardous material has been prevented by secure means of disconnection or by blanking off the flanges from any source of these materials. In addition, that any liquid in which the person could drown, or free flowing solid in which they could be entrapped, has been removed.
- .3 That all electrical/mechanical equipment which may present a hazard to the person has been disconnected from it's power source, either real or residual, and has been locked out in the off position by the person entering the space. Note: The key must be held by the person who locked out the equipment until such time as the work is complete and the lock out is removed by the individual. As well, the removal of fuses is encouraged.
- .4 Tests for oxygen levels, combustibility, and toxicity of hazardous substances (in that order) are conducted and evaluated (e.g. oxygen, explosive gases or vapours, hydrogen sulfide, and then carbon monoxide).
- .1 Tests for oxygen levels and combustibility and toxicity must be made with a probe at the point of entry to the confined space with cover in place. If no hazard is detected the cover will then be removed.
- .2 If oxygen deficient, combustible atmosphere, or toxic substances are detected, the space must not be entered until such time as the space is rendered safe through appropriate purging and ventilation.
- .3 The entire space will then be tested for oxygen deficiency, combustibility and toxicity. Note: In the event the possibility exists for oxygen deficiency, combustible atmosphere or the presence of hazardous substances which could exceed allowable limits, despite purging and ventilation, these tests will only be conducted by a person who is wearing the required personal protective equipment (PPE) such as air supplied respirator, gloves/hand protection, harness, etc. (if tests are to be done in the confined space).

1.8 VERIFICATIONS
(Cont'd)

- .1 (Cont'd)
- .5 That verification, by means of tests, is conducted to ensure that the following specifications can be achieved and maintained during the duration of time the person will be in the confined space, namely:
- .1 The concentration of any chemical agent, or combination of chemical agents in the confined space to which the person is likely to be exposed:
- .1 will not result in a value exceeding the value for that chemical agent, or for any chemical agent in the combination of chemical agents, other than grain dust, as prescribed by reference No.2;
- .2 will not result in an airborne grain dust, respirable and non respirable, in excess of 10 mg/m³, subject to para. 1.8.1.5.2; and
- .3 is less than 50 percent of the lower explosive limit of the chemical agent or combination of chemical agents, subject to para. 1.8.1.5.2.
- .2 Where a source of ignition exists the concentration does not exceed 10 percent of the lower explosive limit of the airborne chemical agent or combination of airborne chemical agents.
- .3 The concentration of airborne hazardous substances, other than chemical agents, in the confined space is not hazardous to the safety or health of the person.
- .4 The percentage of oxygen in the air in the confined space is not less than 19.5 percent by volume and not more than 23 percent by volume, at normal temperature.
- .6 The space has been purged and ventilated to provide and continue to provide a safe working atmosphere, and that in the event of ventilation equipment failure there is:

1.8 VERIFICATIONS
(Cont'd)

- .1 (Cont'd)
- .6 (Cont'd)
- .1 Sufficient time available for the employee to escape the confined space hazard before contamination of the atmosphere.
- .2 The ventilation equipment is either equipped with an approved alarm or monitored by an employee who is in constant attendance on the ventilation equipment and in constant contact with the worker(s) in the confined space.
- .7 The qualified person must, in a signed report, set out the results of the preceding sections, including any test results and a list of test equipment used and must ensure these results are given to the Departmental Representative and Safety Officer.

PART 2 - PRODUCTS

2.1 EQUIPMENT

- .1 All PPE identified on the area work permit must be utilized during entry into the confined space. The appropriate PPE depends upon the nature of the exposure, and may include goggles, hardhats, safety footwear, a complete body covering or suitable breathing apparatus. It is stressed that PPE is not a substitute for proper ventilation. Where the Hazard Assessment form deems it necessary, workers must wear an emergency five minute constant air flow self contained breathing apparatus (SKAT-PAK by SCOTT) and must have an air monitoring device with them at all times while in the confined space. Contractor will supply appropriate PPE for their employees.

2.1 EQUIPMENT
(Cont'd)

- .2 A safety harness with an attached lifeline must be worn by all workers, entering a confined space: with only one manhole or opening at the top or where rescue may be difficult; or where dangerous gases, vapours, mists, fumes, dusts, oxygen deficiency or extremes of temperature are likely to be present; or where respiratory protection is necessary. The free end of the lifeline attached must be secured outside the enclosed space. The lifeline must be of sufficient length to reach from an outside support to any point of work inside the confined space, and must be of sufficient strength to bear the weight of the worker. A tripod hoist and lifting device (vertical use only) must be in place prior to and during work in the confined space. Appropriate positive pressure air supplied respiratory protection must be available at the site for use in the rescue/extraction of persons working in the space. Contractor will supply all required rescue equipment.
- .3 Minimum equipment requirement:
 - .1 Class A confined space:
 - .1 Ventilator, multi-gas detector, communication system, safety harness, retrieval system, SCBA or air line system (to be worn at all times), and duplicate equipment above kept at entrance of confined space for emergency rescue.
 - .2 Class B confined space:
 - .1 Ventilator, multi-gas detector, communication system, safety harness, retrieval system, and SCBA or air line system on hand at entrance of confined space for emergency rescue.
 - .3 Class C confined space:
 - .1 Multi-gas detector, communication system, and SCAT-PAK.

PART 3 - EXECUTION

3.1 CONDITIONS OF ENTRY

- .1 The following conditions must be met, prior to entry, so that response to any emergency can be made in the shortest time frame:

3.1 CONDITIONS OF ENTRY
(Cont'd)

.1

(Cont'd)

.1 A minimum of one person must be posted outside a confined space as an observer and must:

- .1 have no other tasking which would detract from his function of observing the person(s) in the space;
- .2 control the lifeline(s) attached to the person(s) in the space and ensure that the lifeline is attached to a solid object;
- .3 be equipped with a safety harness;
- .4 ensure continuous radio contact with the persons in the space or be able to observe the person(s) in the space (Note: radios are not to be used if combustible atmosphere is present);
- .5 have a means of summoning assistance (qualified personnel) in case of an emergency situation; and
- .6 be trained in rescue procedures and Standard First Aid.

.2 In addition to the observer, for Class A confined spaces, an additional individual (a rescuer) must be present at the entrance to the confined space. The individual must:

- .1 be wearing all required PPE including harness, lifeline and positive pressure air supplied respiratory protection (where required);
- .2 be present at all times when person(s) are working in the confined space;
- .3 be trained in rescue procedures and Standard First Aid; and
- .4 must not enter the space unless to rescue the person(s) working in the space and only after additional assistance has been summoned and all required protective equipment is worn.

3.1 CONDITIONS OF ENTRY
(Cont'd)

- .1 (Cont'd)
- .3 In the event that the observer or the additional person (rescuer, if present) is required to leave the entrance to the space, the space must be vacated by those working in it until such time as the observer and the additional person return. Before re-entering the confined space, the conditions set out in para 1.7 and 1.8 must be followed.
- .4 The minimum number of persons present during entry into and work in a confined space must be three(3) for Class A confined spaces (worker, observer, and rescuer) and two(2) for Class B and C confined spaces (the worker and the observer). Where conditions warrant, an additional person to respond in emergencies is required.
- .5 The contact for additional assistance will be DND Fire Department at local 427-3333.
- .6 No person will enter any confined space for the purpose of rescuing an individual until they are wearing all required PPE including positive pressure air supplied respiratory protection and an observer is on site.

3.2 TESTING &
MAINTENANCE OF
EQUIPMENT

- .1 All testing equipment, safety harnesses, lifelines, breathing apparatus, ventilation equipment and any other equipment used in connection with entry into a confined space by the Contractor will be inspected, maintained and tested by a qualified person as frequent as is necessary to ensure that it is in safe condition for use at all times, but not less frequent than is recommended by the manufacturer or as directed in writing by the Departmental Representative or Safety Officer.

3.3 REGULATIONS

- .1 In the event of conflict or discrepancy between this Section and the source documents and Canada Occupational Health and Safety Regulations, Part XI, the more stringent requirements will apply.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - General Instructions.
- .2 Section 01 35 73 - Confined Spaces Requirements.
- .3 Section 02 82 00.01 - Asbestos Abatement - Type I.
- .4 Section 02 82 00.02 - Asbestos Abatement - Type II.
- .5 Section 02 82 00.01 - Asbestos Abatement - Type III.
- .6 Section 02 83 10 - Lead - Base Paint Abatement Type 1.
- .7 Section 02 83 11 - Lead - Base Paint Abatement Type 2.
- .8 Section 02 83 12 - Lead - Base Paint Abatement Type 3.
- .9 Section 02 84 00 - Polychlorinate Biphenyl Remediation.
- .10 Section 02 85 00.01 - Remediation of Small Scale Mould Growth.
- .11 Section 02 85 00.02 - Remediation of Medium Scale Mould Growth.
- .12 Section 02 85 00.03 - Remediation of Large Scale Mould Growth.

1.2 REFERENCES

- .1 Canadian Environmental Protection Act, 1999 (CEPA 1999)
 - .1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).
- .2 Department of Justice Canada (Jus)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act)
 - .2 Transportation of Dangerous Goods Regulations.
- .3 Health Canada
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).

1.2 REFERENCES
(Cont'd)

.4 National Research Council Canada Institute for Research in
Construction (NRC-IRC)

.1 National Fire Code of Canada (NFC).

1.3 DEFINITIONS

.1 Dangerous goods:

.1 Product, substance, or organism specifically listed or meets
hazard criteria established in Transportation of Dangerous
Goods Regulations.

.2 Hazardous material:

.1 Product, substance, or organism used for its original
purpose; and is either dangerous goods or material that will
cause adverse impact to environment or adversely affect
health of persons, animals, or plant life when released into
the environment.

.3 Hazardous waste:

.1 Hazardous material no longer used for its original purpose
and that is intended for recycling, treatment or disposal.

1.4 SUBMITTALS

.1 Submit hazardous materials management plan to the
Departmental Representative that identifies hazardous materials,
usage, location, personal protective equipment requirements, and
disposal arrangements for each scope of work.

.2 Submit reports in the form of an electronic spreadsheet, bi-annually,
that identifies all hazardous materials removed or encapsulated,
type, original use, the locations hazardous materials were
removed, quantities, date of removal, and final disposal
arrangements.

1.5 DELIVERY, STORAGE
AND HANDLING

.1 Transport hazardous materials and wastes in accordance with
Transportation of Dangerous Goods Act, Transportation of
Dangerous Goods Regulations, and applicable provincial
regulations.

.2 Storage and Handling Requirements:

1.5 DELIVERY, STORAGE
AND HANDLING
(Cont'd)

- .2 (Cont'd)
- .1 Co-ordinate storage of hazardous materials with the Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.
 - .2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes and guidelines.
 - .3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada (NFC) requirements.
 - .4 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
 - .5 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
 - .1 Store hazardous materials and wastes in closed and sealed containers.
 - .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
 - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
 - .4 Segregate incompatible materials and wastes.
 - .5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.
 - .6 Store hazardous materials and wastes in secure storage area with controlled access.
 - .7 Maintain clear egress from storage area.
 - .8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.

1.5 DELIVERY, STORAGE
AND HANDLING
(Cont'd)

.2 (Cont'd)

.5 (Cont'd)

- .9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.
- .10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
- .11 When hazardous waste is generated on site:
 - .1 Co-ordinate transportation and disposal with the Departmental Representative.
 - .2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.
 - .3 Use licensed carrier authorized by provincial authorities to accept subject material.
 - .4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.
 - .5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.
 - .6 Only trained personnel handle, offer for transport, or transport dangerous goods.
 - .7 Provide photocopy of shipping documents and waste manifests to the Departmental Representative.
 - .8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to the Departmental Representative.

1.5 DELIVERY, STORAGE
AND HANDLING
(Cont'd)

.2

(Cont'd)

.5 (Cont'd)

.9

Report discharge, emission, or escape of hazardous materials immediately to the Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.

.12

Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.13

Report spills or accidents immediately to the Departmental Representative. Submit a written spill report to the Departmental Representative within 24 hours of incident.

.3

Workers must follow precautions to minimize risk from disease organisms in the droppings. During the cleanup, seal heating and cooling air ducts or shut the system down. Only authorized cleanup personnel will be present. The cleanup will be done by healthy individuals. Wear a respirator that can filter particles small as 0.3 microns. Wear disposable protective gloves, hat, coveralls and shoe coverings. Moisten the droppings with a light mist of water to keep spores from becoming airborne and keep them wet. Put droppings into sealed plastic garbage bags. The outside of the garbage bags must be rinsed off before they are placed in a disposal container. When finished and while still wearing the respirator, remove protective clothing and place it in a plastic bag. Wash or shower. Check with local government agencies to verify that disposal of the waste is permissible through standard trash pickup.

PART 2 - PRODUCTS

2.1 NOT USED

.1

Not used.

PART 3 - EXECUTION

3.1 CLEANING

.1

Leave Work area clean at end of each day.

3.1 CLEANING
(Cont'd)

- .2 Final Cleaning: Upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management:
 - .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
 - .2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.
 - .3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
 - .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
 - .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfill is prohibited.
 - .6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.
 - .7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - General Instructions.
- .2 Section 01 35 73 - Confined Spaces Requirements.
- .3 Section 02 81 01 - Hazardous Materials.
- .4 Section 02 82 00.02 - Asbestos Abatement - Type II.
- .5 Section 02 82 00.03 - Asbestos Abatement - Type III.
- .6 Section 02 83 10 - Lead - Base Paint Abatement Type 1.
- .7 Section 02 83 11 - Lead - Base Paint Abatement Type 2.
- .8 Section 02 83 12 - Lead - Base Paint Abatement Type 3.
- .9 Section 02 84 00 - Polychlorinate Biphenyl Remediation.
- .10 Section 02 85 00.01 - Remediation of Small Scale Mould Growth.
- .11 Section 02 85 00.02 - Remediation of Medium Scale Mould Growth.
- .12 Section 02 85 00.03 - Remediation of Large Scale Mould Growth.

1.2 SUMMARY

- .1 Comply with requirements of this Section when performing following work:
 - .1 Removing ceiling tiles that are asbestos-containing material, if the tiles cover an area less than 7.5 square metres and are removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
 - .2 Removing non-friable asbestos-containing materials, other than ceiling tiles, if the material is removed without being broken, cut, drilled, abraded, ground, sanded or vibrated at locations indicated by the Departmental Representative.
 - .3 Break, cut, grind, sand, drill, scrape, vibrate or abrade non-friable asbestos containing materials using non-powered hand-held tools, and the material is wetted to control the spread of dust or fibres.

1.2 SUMMARY

(Cont'd)

- .1 (Cont'd)
- .4 Removing less than one square metre of drywall in which joint-filling compounds that are asbestos containing materials have been used.

1.3 REFERENCES

- .1 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .3 Department of National Defence
 - .1 DND/CF Asbestos Management Directive.

1.4 DEFINITIONS

- .1 HEPA vacuum:
 - .1 High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97 % efficiency.
- .2 Amended Water:
 - .1 Water with nonionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.
- .3 Asbestos-Containing Materials (ACMs):
 - .1 Materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .4 Asbestos Work Area:
 - .1 Area where work takes place which will, or may, disturb ACMs.
- .5 Authorized Visitors:

1.4 DEFINITIONS
(Cont'd)

- .5 (Cont'd)
- .1 Departmental Representative, Consultant(s) or designated representative(s), and representative(s) of regulatory agencies.
- .6 Competent worker (person):
- .1 In relation to specific work, means a worker who:
- .1 Is qualified because of knowledge, training and experience to perform the work.
- .2 Is familiar with the provincial, federal laws and with the provisions of the regulations that apply to the work.
- .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .7 Friable material:
- .1 Means material that:
- .1 When dry, can be crumbled, pulverized or powdered by hand pressure, or;
- .2 is crumbled, pulverized or powdered.
- .8 Non-Friable Material:
- .1 Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .9 Occupied Area:
- .1 Any area of the building or work site that is outside Asbestos Work Area.
- .10 Polyethylene:
- .1 Polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

1.4 DEFINITIONS
(Cont'd)

.11 Sprayer:

- .1 Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.

1.5 SUBMITTALS

- .1 Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.
- .2 Submit Provincial and/or local requirements for Notice of Project Form.
- .3 Submit proof of Contractor's Asbestos Liability Insurance.
- .4 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.
- .5 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .6 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements:

- .1 Comply with Federal, Provincial and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.

.2 Health and Safety:

- .1 Safety Requirements: Worker protection.

1.6 QUALITY ASSURANCE
(Cont'd)

.2

(Cont'd)

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(Cont'd)

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Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

.1

Air purifying half mask respirator with N100, R100 or P100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to 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. The respirator to 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. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to 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.

.2

Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing will consist of a 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 to include suitable footwear, and to be repaired or replaced if torn.

1.6 QUALITY ASSURANCE
(Cont'd)

.2

(Cont'd)

.1

(Cont'd)

.3

In addition, the people entering must have available:

.1

a bucket of water to wash down after completion of work; and

.2

polyethylene and tape to seal the return grills.

.2

Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.3

Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.

.4

Facilities for washing hands and face will be provided within or close to the Asbestos Work Area.

.5

Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing will be identified by the Departmental Representative.

.6

Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

1.7 WASTE MANAGEMENT
AND DISPOSAL

.1

Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2

Place materials defined as hazardous or toxic in designated containers.

**1.7 WASTE MANAGEMENT
AND DISPOSAL**
(Cont'd)

- .3 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .4 Fold up metal banding, flatten and place in designated area for recycling.
- .5 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mils bags or leak proof drums. Label containers with appropriate warning labels.
- .6 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.8 EXISTING CONDITIONS

- .1 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this project are available for inspection from the Departmental Representative.
- .2 Notify Departmental Representative of friable material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from the Departmental Representative.

1.9 PERSONNEL TRAINING

- .1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, following minimum requirements:
 - .1 fitting of equipment;
 - .2 inspection and maintenance of equipment;
 - .3 disinfecting of equipment; and
 - .4 limitations of equipment.
- .3 Instruction and training must be provided by a competent, qualified person.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Drop Sheets:
 - .1 Polyethylene: 0.15 mm thick.
 - .2 FR polyethylene: 0.15 mm thick woven fibre reinforce fabric bonded both sides with polyethylene.
- .2 Wetting Agent:
 - .1 50 % polyoxyethylene ester and 50 % polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.
- .3 Waste Containers:
 - .1 Contain waste in two separate containers.
 - .1 Inner container: 0.15 mm thick sealable polyethylene waste bag.
 - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
 - .2 Labelling requirements:
 - .1 Affix pre-printed cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.
- .4 Slow - drying sealer:
 - .1 Non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .5 Tape:

-
- | | | |
|--|----|---|
| <u>2.1 MATERIALS</u>
<u>(Cont'd)</u> | .5 | (Cont'd) |
| | .1 | Fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water. |
|
 | | |
| <u>2.2 EQUIPMENT</u>
<u>CERTIFICATION</u> | .1 | The HEPA vacuum and negative pressure machine must be tested with the DOP method and have a valid certification. |
-
-
- PART 3 - EXECUTION
-
-
- | | | |
|-----------------------|----|--|
| <u>3.1 PROCEDURES</u> | .1 | Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area. |
| | .1 | Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work. |
| | .2 | Use HEPA vacuum or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate. |
| | .3 | Do not use compressed air to clean up or remove dust from any surface. |
| | .2 | Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done. |
| | .1 | Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in Asbestos Work Area where dust and contamination cannot otherwise be safely contained. Drop sheets are not to be reused. |
| | .3 | Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed unless wetting creates hazard or causes damage. |
| | .1 | Use garden reservoir type low - velocity fine - mist sprayer. |
| | .2 | Perform Work to reduce dust creation to lowest levels practicable. |
| | .3 | Work will be subject to visual inspection and air monitoring. |
-

3.1 PROCEDURES
(Cont'd)

- .3 (Cont'd)
- .4 Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .4 Frequently and at regular intervals during Work and immediately on completion of work:
 - .1 dust and waste to be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a waste container; and
 - .2 drop sheets to be wetted and placed in a waste container as soon as practicable.
- .5 Cleanup:
 - .1 Place dust and asbestos containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste; wet and fold these items to contain dust, and then place in plastic bags.
 - .2 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.
 - .3 Seal waste bags and remove from site. Dispose of in accordance with requirements of Provincial and Federal Authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that the appropriate guidelines and regulations for asbestos disposal are followed.
 - .4 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

3.2 INSPECTION

- .1 Inspection of the Asbestos Work Area will be performed to confirm compliance with the requirements of the specifications and governing authorities. Any deviations from these requirements that have not been approved in writing by the Departmental Representative may result in a stoppage of work, at no cost to the Owner.

3.2 INSPECTION
(Cont'd)

- .2 The Departmental Representative is empowered to inspect adherence to specific procedures and materials, and to inspect for final cleanliness and completion. Addititonal labour or materials expended by the Contractor to provide performance to the level specified will be at no additional cost.
- .3 The Departmental Representative is empowered to order a shutdown of work when a leakage of asbestos from the Asbestos Work Area has occured or is likely to occur. Additional labour or materials expended by the Contractor to provide performance to the level specified will be at no additional cost.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - General Instructions.
- .2 Section 01 35 73 - Confined Spaces Requirements.
- .3 Section 02 81 01 - Hazardous Materials.
- .4 Section 02 82 00.01 - Asbestos Abatement - Type I.
- .5 Section 02 82 00.03 - Asbestos Abatement - Type III.
- .6 Section 02 83 10 - Lead - Base Paint Abatement Type 1.
- .7 Section 02 83 11 - Lead - Base Paint Abatement Type 2.
- .8 Section 02 83 12 - Lead - Base Paint Abatement Type 3.
- .9 Section 02 84 00 - Polychlorinate Biphenyl Remediation.
- .10 Section 02 85 00.01 - Remediation of Small Scale Mould Growth.
- .11 Section 02 85 00.02 - Remediation of Medium Scale Mould Growth.
- .12 Section 02 85 00.03 - Remediation of Large Scale Mould Growth.

1.2 SUMMARY

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removing all or part of a false ceiling to obtain access to a work area, if asbestos containing material is likely lying on the surface of the false ceiling.
 - .2 Removing more than 7.5 square metres of asbestos containing suspended ceiling tiles, as indicated.
 - .3 Removal of asbestos containing material from piping, and equipment as indicated.
 - .4 Removal or disturbance of one square metre or less of friable asbestos containing material during the repair, alteration, maintenance or demolition of all or part of machinery or equipment, or of a building.

1.2 SUMMARY

(Cont'd)

- .1 (Cont'd)
- .5 Enclosure of friable asbestos containing material as indicated.
- .6 Application of tape or sealant or other covering to pipe and boiler insulation containing asbestos.
- .7 Removal all or part of a false ceiling to obtain access to a work area, if asbestos containing is likely to be lying on the surface of the false ceiling.
- .8 Removing non-friable asbestos containing materials by breaking, cutting, drilling, abrading, grounding, sanding or vibrating at locations indicated on drawings if:
 - .1 the material is not wetted to control the spread of dust or fibres; and
 - .2 the work is done only by means of non-powered hand-held tools.
- .9 Removing non-friable asbestos containing materials by breaking, cutting, drilling, abrading, grounding, sanding or vibrating at locations indicated on drawings if the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.
- .10 Removing more than one square metre of drywall in which joint-filling compounds that are asbestos containing materials have been used.
- .11 Removing of asbestos containing material from a pipe, duct or similar structure using a glove bag.
- .12 Cleaning or removing filters used in an air handling unit in a building that has sprayed-on asbestos containing fireproofing.

1.3 REFERENCES

- .1 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Health Canada

1.3 REFERENCES
(Cont'd)

- .2 (Cont'd)
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .3 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .4 Underwriters' Laboratories of Canada (ULC)
- .5 Department of National Defence
 - .1 DND/CF Asbestos Management Directive.

1.4 DEFINITIONS

- .1 Amended Water:
 - .1 Water with non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.
- .2 Asbestos-Containing Materials (ACMs):
 - .1 Materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .3 Asbestos Work Area:
 - .1 Area where work takes place which will, or may, disturb ACMs.
- .4 Authorized Visitors:
 - .1 Departmental Representative, Consultant(s) or designated representative(s), and representative(s) of regulatory agencies.
- .5 Competent worker (person):
 - .1 In relation to specific work, means a worker who:
 - .1 is qualified because of knowledge, training and experience to perform the work;

1.4 DEFINITIONS
(Cont'd)

- .5 (Cont'd)
- .1 (Cont'd)
- .2 is familiar with the provincial, federal laws and with the provisions of the regulations that apply to the work; and
- .3 has knowledge of all potential or actual danger to health or safety in the work.
- .6 Friable material:
- .1 Material that when dry, can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- .7 Glove Bag:
- .1 Prefabricated glove bag as follows:
- .1 minimum thickness 0.25 mm (10 mil) polyvinyl-chloride bag;
- .2 integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elastic ports;
- .3 equipped with reversible double pull double throw zipper on top and at approximately mid-section of the bag; and
- .4 straps for sealing ends around pipe.
- .8 HEPA vacuum:
- .1 High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97 % efficiency.
- .9 Non-Friable Material:
- .1 Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .10 Occupied Area:

1.4 DEFINITIONS
(Cont'd)

- .10 (Cont'd)
 - .1 Any area of the building or work site that is outside Asbestos Work Area.
- .11 Polyethylene:
 - .1 Polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
- .12 Sprayer:
 - .1 Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for scope of work.

1.5 SUBMITTALS

- .1 Submit proof satisfactory to the Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.
- .2 Submit Provincial and/or local requirements for Notice of Project Form.
- .3 Submit proof of Contractor's Asbestos Liability Insurance.
- .4 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos containing waste and proof that asbestos containing waste has been received and properly disposed.
- .5 Submit proof satisfactory to Departmental Representative that all asbestos workers have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene, entry and exit from Asbestos Work Area, aspects of work procedures and protective measures while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .6 Submit proof that supervisory personnel have attended asbestos abatement course, of not less than two days duration, approved by Departmental Representative. Minimum of one supervisor for every ten (10) workers.

1.5 SUBMITTALS
(Cont'd)

- .7 Submit Worker's Compensation Board status and transcription of insurance.
- .8 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:
 - .1 encapsulants;
 - .2 amended water; and
 - .3 slow drying sealer.
- .9 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Comply with Federal, Provincial and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at the time work is performed.
- .2 Health and Safety:
 - .1 Safety Requirements: Worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

1.6 QUALITY ASSURANCE
(Cont'd)

.2

(Cont'd)

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(Cont'd)

.1

Air purifying full face respirator with N100, R100 or P100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to 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. The respirator to 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. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to 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.

.2

Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing will consist of a 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 to include suitable footwear, and to be repaired or replaced if torn.

.2

Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

1.6 QUALITY ASSURANCE
(Cont'd)

.2

(Cont'd)

.1 (Cont'd)

.3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.

.4 Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing will be identified by the Departmental Representative.

.5 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

.6 Visitor Protection:

.1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.

.2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.7 WASTE MANAGEMENT
AND DISPOSAL

.1

Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2

Place materials defined as hazardous or toxic in designated containers.

**1.7 WASTE MANAGEMENT
AND DISPOSAL**
(Cont'd)

- .3 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .4 Fold up metal banding, flatten and place in designated area for recycling.
- .5 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mils bags or leak proof drums. Label containers with appropriate warning labels.
- .6 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

1.8 EXISTING CONDITIONS

- .1 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this Project are available for inspection from Departmental Representative.
- .2 Notify Departmental Representative of friable material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.9 PERSONNEL TRAINING

- .1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, in use of glove bag procedures, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, following minimum requirements:
 - .1 fitting of equipment;
 - .2 inspection and maintenance of equipment;
 - .3 disinfecting of equipment; and
 - .4 limitations of equipment.
- .3 Instruction and training must be provided by competent, qualified person.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Drop and Enclosure Sheets:
 - .1 Polyethylene: 0.15 mm thick.
 - .2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Wetting Agent:
 - .1 50 % polyoxyethylene ester and 50 % polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.
- .3 Waste Containers:
 - .1 Contain waste in two separate containers.
 - .1 Inner container: 0.15 mm thick sealable polyethylene bag or where glove bag method is used, glove bag itself.
 - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
 - .2 Labelling requirements:
 - .1 Affix pre-printed cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.
- .4 Glove bag:
 - .1 Acceptable materials: safe-T-Strip products in configuration suitable for Work, or Alternative material approved by addendum during tendering period in accordance with Instructions to Tenderers.
 - .2 The glove bag to be equipped with:

2.1 MATERIALS
(Cont'd)

- .4 (Cont'd)
 - .2 (Cont'd)
 - .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 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;
 - .3 a tool pouch with a drain;
 - .4 a seamless bottom and a means of sealing off the lower portion of the bag;
 - .5 a high strength double throw zipper and removable straps, if the bag is to be moved during the removal operation.
 - .5 Tape:
 - .1 Tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.
 - .6 Slow - drying sealer:
 - .1 Non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
 - .1 Sealer: flame spread and smoke developed rating less than 50 and be compatible with new fireproofing.
 - .7 Encapsulant:
 - .1 Surface film forming or penetrating type.

PART 3 - EXECUTION

3.1 SUPERVISION

- .1 Minimum of one Supervisor for every ten (10) workers is required.

3.1 SUPERVISION
(Cont'd)

- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos-containing materials.

3.2 PROCEDURES

- .1 Before beginning Work, at each access to Asbestos Work Area, install warning signs in both official languages in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used: '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)'.
 - .2 Before beginning Work remove visible dust from surfaces in work area where dust is likely to be disturbed during course of work.
 - .1 Use HEPA vacuum or damp cloths where damp cleaning does not create hazard and is otherwise appropriate.
 - .2 Do not use compressed air to clean up or remove dust from any surface.
 - .3 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
 - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in work areas where dust or contamination cannot otherwise be safely contained.
 - .2 When removing suspended ceilings and walls themselves do not enclose work area and when removing asbestos containing material from piping or equipment and "glove bag" method is not used erect enclosure of polyethylene sheeting around work area, shut off mechanical ventilation system serving work area and seal ventilation ducts to and from work area.
 - .4 Before removing suspended ceilings, remove friable material on upper surfaces using HEPA vacuum equipment.
 - .1 Remove and clean surfaces of ceiling panels using HEPA vacuum, wrap clean panels in 0.10 mm thick polyethylene, and store in building as directed by Departmental Representative.

3.2 PROCEDURES
(Cont'd)

- .4 (Cont'd)
 - .2 Clean "T" grid suspension system, disconnect, wrap in 0.10 mm thick polyethylene, and store in building as directed by Departmental Representative.
- .5 Remove loose material by HEPA vacuum; thoroughly wet friable material containing asbestos to be removed or disturbed before and during Work unless wetting creates hazard or causes damage.
 - .1 Use garden reservoir type low - velocity sprayer or airless spray equipment capable of producing mist or fine spray.
 - .2 Perform Work in a manner to reduce dust creation to lowest levels practicable.
- .6 Pipe Insulation Removal Using Glove Bag:
 - .1 A glove bag not to be used to remove insulation from a pipe, duct or similar structure if:
 - .1 it may not be possible to maintain a proper seal for any reason including, without limitation:
 - .1 the condition of the insulation;
 - .2 the temperature of the pipe, duct or similar structure;
 - .2 the bag could become damaged for any reason including, without limitation:
 - .1 the type of jacketing;
 - .2 the temperature of the pipe, duct or similar structure.

3.2 PROCEDURES

(Cont'd)

.6

(Cont'd)

.1 (Cont'd)

.2 Upon installation of the glove bag, inspect bag for any damage or defects. If any damage or defects are found, the glove bag is to be repaired or replaced. The glove bag to be inspected at regular intervals for damage and defects, and repair or replaced, as appropriately. The asbestos containing contents of the damaged or defective glove bag found during removal are to be wetted and the glove bag and its contents are to be removed and disposed of in an appropriate waste disposal container. Any damaged or defective glove bags are not be reused.

.3 Place tools necessary to remove insulation in tool pouch. Wrap bag around pipe and close zippers. Seal bag to pipe with cloth straps.

.4 Place hands in gloves and use necessary tools to remove insulation. Arrange insulation in bag to obtain full capacity of bag.

.5 Insert nozzle of garden reservoir type sprayer into bag through valve and wash down pipe and interior of bag thoroughly. Wet surface of insulation in lower section of bag.

.6 To remove bag after completion of stripping, wash top section and tools thoroughly. Remove air from top section through elasticized valve using a HEPA vacuum. Pull polyethylene waste container over glove bag before removing from pipe. Release one strap and remove freshly washed tools. Place tools in water. Remove second strap and zipper. Fold over into waste container and seal.

.7 After removal of bag ensure that pipe is free of residue. Remove residue using HEPA vacuum or wet cloths. Ensure that surfaces are free of sludge which after drying could release asbestos dust into atmosphere. Seal exposed surfaces of pipe and ends of insulation with slow drying sealer to seal in any residual fibres.

.8 Upon completion of Work shift, cover exposed ends of remaining pipe insulation with polyethylene taped in place.

3.2 PROCEDURES
(Cont'd)

- .7 Work is subject to visual inspection and air monitoring. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .8 Cleanup:
- .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos containing waste using HEPA vacuum or by damp mopping.
 - .2 Place dust and asbestos containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
 - .3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
 - .4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.
 - .5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.3 AIR MONITORING

- .1 From beginning of Work until completion of cleaning operations, testing agency to take air samples on daily basis inside and outside of Asbestos Work Area enclosures in accordance with Provincial Occupational Health and Safety Regulations and PSPC requirements.
- .2 If air monitoring shows that areas outside Asbestos Work Area enclosures are contaminated, enclose, maintain and clean these areas in same manner as that applicable to Asbestos Work Area.
- .3 Ensure that respiratory safety factors are not exceeded.

3.3 AIR MONITORING
(Cont'd)

- .4 During the course of Work, testing agency to measure fibre content of air outside Work areas by means of air samples analyzed by Phase Contrast Microscopy (PCM).
- .1 Stop Work when PCM measurements exceeding the following action levels and correct procedures:
- .1 ambient - 0.01 f/cc; and
- .2 clean room - 0.01 f/cc.
- .2 Final air monitoring results must show fibre levels of less than 0.01 f/cc.
- .3 If air monitoring results show fibre levels in excess of 0.01 f/cc, air clearance will not be granted. The Contractor must re-clean work area and apply another acceptable coat of lock-down agent to surfaces throughout the containment area. A second 4-hour settling time is required, then the area is re-sampled until a passing air fibre level is achieved. The additional work to obtain air clearance is at the cost of the abatement Contractor.
- .4 Repeat as necessary until fibre levels are less than 0.01 f/cc.
- .5 Once air clearance is attained and granted, tear down may proceed.

3.4 INSPECTION

- .1 Inspection of the Asbestos Work Area will be performed to confirm compliance with the requirements of the specifications and governing authorities. Any deviations from these requirements that have not been approved in writing by the Departmental Representative may result in a stoppage of work, at no cost to the Owner.
- .2 The Departmental Representative is empowered to inspect adherence to specific procedures and materials, and to inspect for final cleanliness and completion. Additonal labour or materials expended by the Contractor to provide performance to the level specified will be at no additional cost.

3.4 INSPECTION
(Cont'd)

- .3 The Departmental Representative is empowered to order a shutdown of work when a leakage of asbestos from the Asbestos Work Area has occurred or is likely to occur. Additional labour or materials expended by the Contractor to provide performance to the level specified will be at no additional cost.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - General Instructions.
- .2 Section 01 35 73 - Confined Spaces Requirements.
- .3 Section 02 81 01 - Hazardous Materials.
- .4 Section 02 82 00.01 - Asbestos Abatement - Type I.
- .5 Section 02 82 00.02 - Asbestos Abatement - Type II.
- .6 Section 02 83 10 - Lead - Base Paint Abatement Type 1.
- .7 Section 02 83 11 - Lead - Base Paint Abatement Type 2.
- .8 Section 02 83 12 - Lead - Base Paint Abatement Type 3.
- .9 Section 02 84 00 - Polychlorinate Biphenyl Remediation.
- .10 Section 02 85 00.01 - Remediation of Small Scale Mould Growth.
- .11 Section 02 85 00.02 - Remediation of Medium Scale Mould Growth.
- .12 Section 02 85 00.03 - Remediation of Large Scale Mould Growth.

1.2 SUMMARY

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removal or disturbance as specified of more than one square metre of friable asbestos containing material during the repair, alteration, maintenance or demolition of a building or any machinery or equipment located as indicated.
 - .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 asbestos containing sprayed fireproofing.

1.2 SUMMARY
(Cont'd)

- .1 (Cont'd)
- .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.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA International)
- .2 Department of Justice Canada (JUS)
 - .1 Canadian Environmental Protection Act (CEPA), 1999.
 - .2 SOR/2018-196 Prohibition of Asbestos and Products Containing Asbestos Regulations.
- .3 Health Canada
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .5 Underwriters' Laboratories of Canada (ULC)
- .6 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention (CDC)/National Institute for Occupational Safety and Health (NIOSH)
 - .1 NIOSH METHODS, NIOSH Manual of Analytical Methods (NMAM).
- .7 U.S. Department of Labour - Occupational Safety and Health Administration - Toxic and Hazardous Substances.

1.3 REFERENCES
(Cont'd)

- .8 Department of National Defence
- .1 DND/CF Asbestos Management Directive.

1.4 DEFINITIONS

- .1 Airlock:
- .1 System for permitting ingress or egress without permitting air movement between contaminated area and uncontaminated area, typically consisting of two curtained doorways at least 2 m apart.
- .2 Amended Water:
- .1 Water with a non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.
- .3 Asbestos Containing Materials (ACMs):
- .1 Materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .4 Asbestos Work Areas:
- .1 Area where work takes place which will, or may disturb ACMs.
- .5 Authorized Visitors:
- .1 Departmental Representative or designated representatives, and representatives of regulatory agencies.
- .6 Competent worker (person):
- .1 In relation to specific work, means a worker who:
- .1 Is qualified because of knowledge, training and experience to perform the work.
- .2 Is familiar with the provincial, federal laws and with the provisions of the regulations that apply to the work.

1.4 DEFINITIONS

(Cont'd)

- .6 (Cont'd)
 - .1 (Cont'd)
 - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .7 Curtained doorway:
 - .1 Arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:
 - .1 Place two overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.
 - .2 Reinforce free edges of polyethylene with duct tape and weight bottom edge to ensure proper closing.
 - .3 Overlap each polyethylene sheet at openings not less than 1.5 m on each side.
- .8 DOP Test:
 - .1 Testing method used to determine integrity of Negative Pressure unit using dioctyl phthalate (DOP) HEPA-filter leak test.
- .9 Friable Materials:
 - .1 Material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- .10 Glove Bag:
 - .1 Prefabricated glove bag as follows:
 - .1 minimum thickness 0.25 mm (10 mil) polyvinyl-chloride bag;

1.4 DEFINITIONS
(Cont'd)

- .10 (Cont'd)
 - .1 (Cont'd)
 - .2 integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elastic ports;
 - .3 equipped with reversible double pull double throw zipper on top and at approximately mid-section of the bag; and
 - .4 straps for sealing ends around pipe.
- .11 HEPA vacuum:
 - .1 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.
- .12 Negative pressure:
 - .1 System that extracts air directly from work area, filters such extracted air through High Efficiency Particulate Air filtering system, and discharges this air directly outside work area to exterior of building.
 - .1 System to maintain minimum pressure differential of 5 Pa relative to adjacent areas outside of work areas, be equipped with alarm to warn of system breakdown, and be equipped with instrument to continuously monitor and automatically record pressure differences.
- .13 Non-Friable Materials:
 - .1 Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .14 Occupied Areas:
 - .1 Any area of building or work site that is outside Asbestos Work Area.
- .15 Polyethylene sheeting sealed with tape:

1.4 DEFINITIONS
(Cont'd)

.15 (Cont'd)

- .1 Polyethylene sheeting of type and thickness specified sealed with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide continuous polyethylene membrane to protect underlying surfaces from water damage or damage by sealants, and to prevent escape of asbestos fibres through sheeting into clean area.

.16 Sprayer:

- .1 Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.

1.5 SUBMITTALS

.1 Before beginning work:

- .1 Obtain from appropriate agency and submit to Departmental Representative necessary permits for transportation and disposal of asbestos waste. Ensure that dump operator is fully aware of hazardous nature of material being dumped, and proper methods of disposal. Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to receive and properly dispose of asbestos waste.
- .2 Submit proof satisfactory to Departmental Representative that all asbestos workers have received appropriate training and education by a competent person on hazards of asbestos exposure, good personal hygiene, entry and exit from Asbestos Work Area, aspects of work procedures and protective measures while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing. Submit proof of attendance in form of certificate.
- .3 Ensure supervisory personnel have attended asbestos abatement course, of not less than two days duration, approved by Departmental Representative. Submit proof of attendance in form of certificate. Minimum of one Supervisor for every ten (10) workers.
- .4 Submit layout of proposed enclosures and decontamination facilities to Departmental Representative for review.

1.5 SUBMITTALS
(Cont'd)

- .1 (Cont'd)
- .5 Submit documentation including test results for sealer proposed for use.
- .6 Submit Provincial and/or local requirements for Notice of Project form.
- .7 Submit proof of Contractor's Asbestos Liability Insurance.
- .8 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.
- .9 Submit Worker's Compensation Board status and transcription of insurance.
- .10 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including but not limited to following:
 - .1 encapsulants;
 - .2 amended water; and
 - .3 slow drying sealer.
- .11 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Comply with Federal, Provincial and local requirements pertaining to asbestos, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
 - .1 Safety Requirements: worker and visitor protection.

1.6 QUALITY ASSURANCE
(Cont'd)

.2

(Cont'd)

.1

(Cont'd)

.1

Protective equipment and clothing to be worn by workers while in Asbestos Work Area includes:

.1

Powered air purifying respirator (PAPR) with N100, R100 or P100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to 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. The respirator to 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. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to 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.

1.6 QUALITY ASSURANCE
(Cont'd)

.2

(Cont'd)

.1

(Cont'd)

.2

Disposable type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing to consist of a 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. It includes suitable footwear, and it to be repaired or replaced if torn.

Requirements for each worker:

.1

Remove street clothes in clean change room and put on respirator with new filters or reusable filters that have been tested as satisfactory, clean coveralls and head covers before entering Equipment and Access Rooms or Asbestos Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.

1.6 QUALITY ASSURANCE
(Cont'd)

.2 (Cont'd)
.1 (Cont'd)

- .2 Remove gross contamination from clothing before leaving work area then proceed to Equipment and Access Room and remove clothing except respirators. Place contaminated work suits in receptacles for disposal with other asbestos - contaminated materials. Leave reusable items except respirator in Equipment and Access Room. Still wearing the respirator proceed naked to showers. Using soap and water wash body and hair thoroughly. Clean outside of respirator with soap and water while showering; remove respirator; remove filters and wet them and dispose of filters in container provided for purpose; and wash and rinse inside of respirator. When not in use in work area, store work footwear in Equipment and Access Room. Upon completion of asbestos abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from Equipment and Access Room.
- .3 After showering and drying off, proceed to clean change room and dress in street clothes at end of each day's work, or in clean coveralls before eating, smoking, or drinking. If re-entering work area, follow procedures outlined in paragraphs above.

1.6 QUALITY ASSURANCE
(Cont'd)

.2

(Cont'd)

.1 (Cont'd)

.4 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers must not use this system as means to leave or enter work area.

.2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.3 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual asbestos abatement.

.4 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.

.5 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

.6 Visitor Protection:

.1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.

.2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.7 WASTE MANAGEMENT
AND DISPOSAL

.1

Remove from site and dispose of packaging materials at appropriate recycling facilities.

1.7 WASTE MANAGEMENT
AND DISPOSAL
(Cont'd)

- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .4 Fold up metal banding, flatten and place in designated area for recycling.
- .5 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mils bags or leak proof drums. Label containers with appropriate warning labels.
- .6 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

1.8 EXISTING CONDITIONS

- .1 Results of tests of asbestos containing materials to be handled, removed, or otherwise disturbed and disposed of during this Project are available for inspection from the Departmental Representative. These are for general information only and are not necessarily representative of asbestos containing materials covered within scope of this Project.
- .2 Notify Departmental Representative of suspect asbestos containing material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.9 SCHEDULING

- .1 Not later than five (5) days before beginning Work on this Project notify following in writing:
 - .1 appropriate Regional or Zone Director of Medical Services Branch, Health Canada;
 - .2 Regional Office of Labour Canada;
 - .3 Provincial Department of Labour; and
 - .4 disposal Authority.
- .2 Inform sub-trades of presence of asbestos containing materials identified in Existing Conditions.

- 1.9 SCHEDULING
(Cont'd)
- .3 Submit to Departmental Representative copy of notifications prior to start of Work.
- 1.10 PERSONNEL TRAINING
- .1 Before beginning Work, provide to Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene including dress and showers, in entry and exit from Asbestos Work Area, in aspects of work procedures including glove bag procedures, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, at minimum:
- .1 proper fitting of equipment;
- .2 inspection and maintenance of equipment;
- .3 disinfecting of equipment; and
- .4 limitations of equipment.
- .3 Instruction and training must be provided by competent, qualified person.
- .4 Supervisory personnel to complete required training.

PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Polyethylene:
- .1 Minimum 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
- .2 FR polyethylene:
- .1 Minimum 0.15 mm thick, woven fibre reinforced fabric bonded both sides with polyethylene.
- .3 Tape:

2.1 MATERIALS
(Cont'd)

- .3 (Cont'd)
 - .1 Fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.
- .4 Wetting agent:
 - .1 50% polyoxyethylene ester and 50 % polyoxyethylene ether, or other material approved by Departmental Representative, mixed with water in concentration to provide adequate penetration and wetting of asbestos containing material.
- .5 Waste Containers:
 - .1 Contain waste in two separate containers.
 - .1 Inner container:
 - .1 0.15 mm thick sealable polyethylene bag or where glove bag method is used, glove bag itself.
 - .2 Outer container:
 - .1 Sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
 - .2 Labelling requirements:
 - .1 Affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site. Label containers in accordance with Asbestos Regulations 29 CFR 1910.1001. Label in both official languages.
- .6 Glove bag:
 - .1 Acceptable materials: Safe-T-Strip products in configuration suitable for Work, or Alternative material approved by addendum during tendering period in accordance with Instructions to Tenderers.

2.1 MATERIALS
(Cont'd)

.6 (Cont'd)

.2 The glove bag to be equipped with:

- .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 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;
- .3 a tool pouch with a drain;
- .4 a seamless bottom and a means of sealing off the lower portion of the bag; and
- .5 a high strength double throw zipper and removable straps, if the bag is to be moved during the removal operation.

.7 Tape:

- .1 Fibreglass - reinforced duct tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.

.8 Slow - drying sealer:

- .1 Non-staining, clear, water - dispersible type that remains tacky on surface for at least eight (8) hours and designed for purpose of trapping residual asbestos fibres.

.9 Sealer:

- .1 Flame spread and smoke developed rating less than 50 and be compatible with new fireproofing.

.10 Encapsulants:

- .1 Type 2 surface film forming or type 1 penetrating type Class A water based and approved by the Fire Commissioner of Canada.

2.1 MATERIALS
(Cont'd)

- .11 Sprayed fireproofing:
- .1 ULC labelled and listed asbestos-free cementitious or mineral fibre to provide degree of fire or thermal protection required.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Work Areas:
- .1 Shut off and isolate air handling and ventilation systems to prevent fibre dispersal to other building areas during work phase. Conduct smoke tests to ensure that duct work is airtight. Seal and caulk joints and seams of active return air ducts within Asbestos Work Area.
- .2 Preclean moveable furniture and carpeting within proposed work areas using HEPA vacuum and remove from work areas to temporary location.
- .3 Preclean fixed casework, plant, and equipment within proposed work areas, using HEPA vacuum and cover with polyethylene sheeting sealed with tape.
- .4 Clean proposed work areas using, where practicable, HEPA vacuum cleaning equipment. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum equipment.
- .5 The spread of dust from the work area to be prevented by:
- .1 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
- .2 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.

3.1 PREPARATION
(Cont'd)

.1 (Cont'd)

- .6 Put negative pressure system in operation and operate continuously from time first polyethylene is installed to seal openings until final completion of work including final cleanup. Provide continuous monitoring of pressure difference using automatic recording instrument. The system to maintain a negative air pressure of 0.02 inches (5 Pa) of water, relative to the area outside the enclosed area. The system to be inspected and maintained by a competent person prior each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it to be replaced before the ventilation system is used.
- .7 Seal off openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
- .8 Cover floor and wall surfaces with polyethylene sheeting sealed with tape. Use two layers of FR polyethylene on floors. Cover floors first so that polyethylene extends at least 300 mm up walls then cover walls to overlap floor sheeting.
- .9 Build airlocks at entrances to and exits from work areas so that work areas are always closed off by one curtained doorway when workers enter or exit.
- .10 At each access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used: "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)".
- .11 After work area isolation, remove heating, ventilating, and air conditioning filters, pack in sealed plastic bags 0.15 mm minimum thick and treat as contaminated asbestos waste. Remove ceiling - mounted objects such as lights, partitions, other fixtures not previously sealed off, and other objects that interfere with asbestos removal, as directed by Engineer. Use localized water spraying during fixture removal to reduce fibre dispersal.

3.1 PREPARATION
(Cont'd)

- .1 (Cont'd)
- .12 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Fire Commissioner of Canada and Provincial Fire Marshall and Authority having jurisdiction.
- .13 Where application of water is required for wetting asbestos containing materials, shut off electrical power, provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.
- .14 After preparation of work areas and Decontamination Enclosure Systems, remove designated asbestos containing ceiling tiles within work areas progressively and carefully, clean using HEPA vacuum and damp sponge, wrap clean panels in 0.10 mm minimum thick polyethylene, and store in building as directed by Engineer and dispose of as contaminated waste. Clean "T" grid suspension system within work areas using wet sponge, disconnect grid from hangers, wrap grid members in 0.10 mm minimum thick polyethylene and store in building as directed by Departmental Representative.
- .15 After preparation of work areas and Decontamination Enclosure Systems, remove plaster ceilings, including lath, furring, channels, hangers, wires, clips, and dispose of as contaminated waste in specified containers. Spray asbestos debris and immediate work area with amended water to reduce dust, as work progresses.
- .16 After preparation of work areas and Decontamination Enclosure Systems, for the removal of all other asbestos containing materials, remove within work area and dispose of as contaminated waste in specified containers. Spray asbestos debris and immediate work area with amended water to reduce dust, as work progresses.
- .2 Worker Decontamination Enclosure System:
- .1 Worker Decontamination Enclosure System includes Equipment and Access Room, Shower Room, and Clean Room, as follows:

3.1 PREPARATION
(Cont'd)

.2 (Cont'd)

.1 (Cont'd)

.1 Equipment and Access Room:

.1 Build Equipment and Access Room between Shower Room and work areas, with two curtained doorways, one to Shower Room and one to work areas. Install portable toilet, waste receptor, and storage facilities for workers' shoes and protective clothing to be reworn in work areas. Build Equipment and Access Room large enough to accommodate specified facilities, other equipment needed, and at least one worker allowing him/her sufficient space to undress comfortably.

.2 Shower Room:

.1 Build Shower Room between Clean Room and Equipment and Access Room, with two curtained doorways, one to Clean Room and one to Equipment and Access Room. Provide one shower for every five workers. Provide constant supply of hot and cold or warm water. Cold and hot water source will be provided. Drains to common sewers will be provided. Provide piping and connect to water sources and drains. Pump waste water through 5 micrometre filter system acceptable to Departmental Representative before directing into drains. Provide soap, clean towels, and appropriate containers for disposal of used respirator filters.

.3 Clean Room:

3.1 PREPARATION
(Cont'd)

.2 (Cont'd)

.1 (Cont'd)

.1 Build Clean Room between Shower Room and clean areas outside of enclosures, with two curtained doorways, one to outside of enclosures and one to Shower Room. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.

.3 Container and Equipment Decontamination Enclosure System:

.1 Container and Equipment Decontamination Enclosure System consists of Staging Area within work area, Washroom, Holding Room, and Unloading Room. Purpose of system is to provide means to decontaminate waste containers, scaffolding, waste and material containers, vacuum and spray equipment, and other tools and equipment for which Worker Decontamination Enclosure System is not suitable.

.1 Staging Area:

.1 Designate Staging Area in work area for gross removal of dust and debris from waste containers and equipment, labelling and sealing of waste containers, and temporary storage pending removal to Washroom. Equip Staging Area with curtained doorway to Washroom.

.2 Washroom:

.1 Build Washroom between Staging Area and Holding Room with two curtained doorways, one to Staging Area and one to Holding Room. Provide high - pressure low - volume sprays for washing of waste containers and equipment. Pump waste water through 5 micrometre filter system before directing into drains. Provide piping and connect to water sources and drains.

3.1 PREPARATION
(Cont'd)

.3 (Cont'd)

.1 (Cont'd)

.3 Holding Room:

.1 Build Holding Room between Washroom and Unloading Room, with two curtained doorways, one to Washroom and one to Unloading Room. Build Holding Room sized to accommodate at least two waste containers and largest item of equipment used.

.4 Unloading Room:

.1 Build Unloading Room between Holding Room and outside, with two curtained doorways, one to Holding Room and one to outside.

.4 Construction of Decontamination Enclosures:

.1 Build suitable framing for enclosures or use existing rooms where convenient, and line with polyethylene sheeting sealed with tape. Use two (2) layers of FR polyethylene on floors.

.2 Build curtained doorways between enclosures so that when people move through or when waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.

.5 Separation of Work Areas from Occupied Areas:

.1 Separate parts of building required to remain in use as indicated from parts of building used for asbestos abatement by means of airtight barrier system constructed as follows:

.1 Build suitable floor to ceiling lumber or metal stud framing, cover with polyethylene sheeting sealed with tape, and apply 9 mm minimum thick plywood. Seal joints between plywood sheets and between plywood and adjacent materials with surface film forming type sealer, to create airtight barrier.

3.1 PREPARATION
(Cont'd)

- .5 (Cont'd)
 - .1 (Cont'd)
 - .2 Cover plywood barrier with polyethylene sealed with tape, as specified for work areas.
- .6 Maintenance of Enclosures:
 - .1 Maintain enclosures in tidy condition.
 - .2 Ensure that barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.
 - .3 Visually inspect enclosures at beginning of each working period.
 - .4 Use smoke methods to test effectiveness of barriers when directed by Departmental Representative.
- .7 Do not begin Asbestos Abatement work until:
 - .1 Arrangements have been made for disposal of waste.
 - .2 For wet stripping techniques, arrangements have been made for containing, filtering, and disposal of waste water.
 - .3 Work areas and decontamination enclosures and parts of building required to remain in use are effectively segregated.
 - .4 Tools, equipment, and materials waste containers are on hand.
 - .5 Arrangements have been made for building security.
 - .6 Warning signs are displayed where access to contaminated areas is possible.
 - .7 Notifications have been completed and other preparatory steps have been taken.

3.2 SUPERVISION

- .1 Minimum of one (1) Supervisor for every ten (10) workers is required.

3.2 SUPERVISION
(Cont'd)

- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos containing materials.

3.3 ASBESTOS REMOVAL

- .1 Before removing asbestos:
- .1 Prepare site.
 - .2 Spray asbestos material with water containing specified wetting agent, using airless spray equipment capable of providing "mist" application to prevent release of fibres. Saturate asbestos material sufficiently to wet it to substrate without causing excess dripping. Spray asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.
- .2 Remove saturated asbestos material in small sections. Do not allow saturated asbestos to dry out. As it is being removed pack material in sealable plastic bags 0.15 mm minimum thick and place in labelled containers for transport.
- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure that containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of stripping work, wire brushed and wet sponged surfaces from which asbestos has been removed to remove visible material. During this work keep surfaces wet.
- .5 Where Departmental Representative decides complete removal of asbestos containing material is impossible due to obstructions such as structural members or major service elements, or because asbestos containing material was originally applied to asphaltic coating, and provides written direction, encapsulate material as follows:

3.3 ASBESTOS REMOVAL
(Cont'd)

- .5 (Cont'd)
- .1 Apply surface film forming type sealer to provide 0.635 mm minimum dry film thickness over sprayed asbestos surfaces. Apply using airless spray equipment to avoid blowing off fibres. Apply penetrating type sealer to penetrate existing sprayed asbestos surfaces uniformly to substrate.
- .6 After wire brushing and wet sponging to remove visible asbestos, and after encapsulating asbestos containing material impossible to remove, wet clean entire work area including Equipment and Access Room, and equipment used in process. After 24 hour period to allow for dust settling, wet clean these areas and objects again. During this settling period no entry, activity, or ventilation will be permitted. After second 24 hour period under same conditions, clean these areas and objects again using HEPA vacuum followed by wet cleaning. After inspection by Departmental Representative apply continuous coat of slow drying sealer to surfaces of work area. Allow at least 16 hours with no entry, activity, ventilation, or disturbance other than operation of negative pressure units during this period.
- .7 Work is subject to visual inspection and air monitoring. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .8 Cleanup:
- .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos containing waste using HEPA vacuum or by damp mopping.
- .2 Place dust and asbestos containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
- .3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.

3.3 ASBESTOS REMOVAL
(Cont'd)

- .8 (Cont'd)
- .4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.
- .5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.4 FINAL CLEANUP

- .1 Following cleaning specified in section above, and when air sampling shows that asbestos levels on both sides of seals do not exceed 0.01 fibres/cc as determined by membrane filter method at 400-500X magnification phase contrast illumination, as described in NIOSH Method 94-113 or equivalent, proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible asbestos containing particles observed during cleanup, immediately, using HEPA vacuum equipment.
- .3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .4 Include in clean-up Work areas, Equipment and Access Room, Washroom, Shower Room, and other contaminated enclosures.
- .5 Include in clean-up sealed waste containers and equipment used in Work and remove from work areas, via Container and Equipment Decontamination Enclosure System, at appropriate time in cleaning sequence.
- .6 Conduct final check to ensure that no dust or debris remains on surfaces as result of dismantling operations and carry out air monitoring again to ensure that asbestos levels in building do not exceed 0.01 fibres/cc. Repeat cleaning using HEPA vacuum equipment, or wet cleaning methods where feasible, in conjunction with sampling until levels meet this criteria.

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| <u>3.4 FINAL CLEANUP
(Cont'd)</u> | .7 | As work progresses, and to prevent exceeding available storage capacity on site, remove sealed and labelled containers containing asbestos waste and dispose of to authorized disposal area in accordance with requirements of disposal authority. Ensure that each shipment of containers transported to dump is accompanied by Contractor's representative to ensure that dumping is done in accordance with governing regulations. |
|
 | | |
| <u>3.5 RE-ESTABLISHMENT OF
OBJECTS AND SYSTEMS</u> | .1 | When cleanup is complete: <ul style="list-style-type: none">.1 Re-establish objects and furniture moved to temporary locations in course of Work, in their proper positions..2 Re-secure mounted objects removed in course of Work in their former positions..3 Re-establish mechanical and electrical systems in proper working order. Install new filters..4 Repair or replace objects damaged in the course of Work, as directed by Departmental Representative. |
|
 | | |
| <u>3.6 AIR MONITORING</u> | .1 | From beginning of Work until completion of cleaning operations, air monitoring will be performed on behalf of the Contractor by a testing agency on daily basis both inside and outside of work area enclosure in accordance with Health Canada recommendations. <ul style="list-style-type: none">.1 Contractor will be responsible for monitoring inside enclosure in accordance with applicable Provincial Occupational Health and Safety Regulations. |
| | .2 | Use results of air monitoring inside work area to establish type of respirators to be used. Workers may be required to wear sample pumps for up to full-shift periods. <ul style="list-style-type: none">.1 If fibre levels are above safety factor of respirators in use, stop abatement, apply means of dust suppression, and use higher safety factor in respiratory protection for persons inside enclosure. |
-

3.6 AIR MONITORING
(Cont'd)

- .2 (Cont'd)
 - .2 If air monitoring shows that areas outside work area enclosures are contaminated, enclose, maintain and clean these areas, in same manner as that applicable to work areas.
- .3 During course of Work, testing agency to measure fibre content of air outside work areas by means air samples analyzed by Phase Contrast Microscopy (PCM).
 - .1 Stop Work when PCM measurements exceeding the following action levels and correct procedures:
 - .1 ambient - 0.01 f/cc; and
 - .2 clean room - 0.01 f/cc.
- .4 Final air monitoring to be conducted as follows:
 - .1 After Asbestos Work Area has passed visual inspection and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period has passed, testing agency will perform air monitoring within Asbestos Work Area by aggressive methods, where provincial regulations require.
 - .1 Final air monitoring results must show fibre levels of less than 0.01 f/cc.
 - .2 If air monitoring results show fibre levels in excess of 0.01 f/cc, air clearance will not be granted. The Contractor must re-clean work area and apply another acceptable coat of lock-down agent to surfaces throughout the containment area. A second 4-hour settling time is required, then the area is re-sampled until a passing air fibre level is achieved. The additional work to obtain air clearance is at the cost of the abatement Contractor.
 - .3 Repeat as necessary until fibre levels are less than 0.01 f/cc.
 - .4 Once air clearance is attained and granted, tear down may proceed.

3.7 INSPECTION

- .1 Perform inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviations from these requirements that have not been approved in writing by Departmental Representative may result in Work stoppage, at no cost to Owner.
- .2 Departmental Representative will inspect Work for:
 - .1 adherence to specific procedures and materials;
 - .2 final cleanliness and completion; and
 - .3 no additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.
- .3 When asbestos leakage from Asbestos Work Area has occurred or is likely to occur Departmental Representative may order Work shutdown.
 - .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - General Instructions.
- .2 Section 01 35 73 - Confined Spaces Requirements.
- .3 Section 02 81 01 - Hazardous Materials.
- .4 Section 02 82 00.01 - Asbestos Abatement - Type I.
- .5 Section 02 82 00.02 - Asbestos Abatement - Type II.
- .6 Section 02 82 00.03 - Asbestos Abatement - Type III.
- .7 Section 02 83 11 - Lead - Base Paint Abatement Type 2.
- .8 Section 02 83 12 - Lead - Base Paint Abatement Type 3.
- .9 Section 02 84 00 - Polychlorinate Biphenyl Remediation.
- .10 Section 02 85 00.01 - Remediation of Small Scale Mould Growth.
- .11 Section 02 85 00.02 - Remediation of Medium Scale Mould Growth.
- .12 Section 02 85 00.03 - Remediation of Large Scale Mould Growth.

1.2 SUMMARY

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap on walls, ceilings and/or as indicated on drawings.
 - .2 Removal of lead-containing coatings or materials using a power tool with an effective dust collection system equipped with a HEPA filter on walls, ceilings and/or as indicated on drawings.
 - .3 Removal of lead-containing coatings or materials with non-powered hand tool, other than manual scraping and sanding on walls, ceilings and/or as indicated on drawings.

1.3 REFERENCES

- .1 Department of Justice Canada (JUS)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Health Canada
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .3 Human Resources and Social Development Canada (HRSDC)
 - .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.
- .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .5 Underwriters' Laboratories of Canada (ULC)
- .6 U.S. Department of Health and Human Services / Centers for Disease Control and Prevention / National Institute for Occupational Safety and Health (NIOSH)
 - .1 NIOSH METHODS, NIOSH Manual of Analytical Methods (NMAM).
- .7 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances
 - .1 Lead in Construction Regulation - 29 CFR 1926.62.
- .8 U.S. Environmental Protection Agency (EPA)
 - .1 EPA 747-R-95-007, Sampling House Dust for Lead.
- .9 Province of Nova Scotia
 - .1 Occupational Health and Safety Act, S.N.S.

1.4 DEFINITIONS

- .1 HEPA vacuum:

1.4 DEFINITIONS

(Cont'd)

- .1 (Cont'd)
 - .1 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.
- .2 Authorized Visitors:
 - .1 Departmental Representative or designated representatives.
- .3 Polyethylene:
 - .1 Polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects over cuts and tears, and elsewhere as required to provide protection and isolation. For protection of underlying surfaces from damage and to prevent lead dust entering in clean area.
- .4 Sprayer:
 - .1 Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.
- .5 Action level:
 - .1 Employee exposure, without regard to use of respirators, to airborne concentration of lead of 50 micrograms per cubic meter of air (50 ug/m³) calculated as 8-hour time-weighted average (TWA). Minimum precautions for lead abatement are based on airborne lead concentrations less than 0.05 milligrams per cubic meter of air for removal of lead based paint by methods noted in paragraph 1.2.
- .6 Competent person:
 - .1 Individuals, Engineer or representatives capable of identifying existing lead hazards in workplace taking corrective measures to eliminate them.
- .7 Lead dust:

1.4 DEFINITIONS
(Cont'd)

- .7 (Cont'd)
- .1 Wipe sampling on vertical surfaces and/or horizontal surfaces, dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot.

1.5 SUBMITTALS

- .1 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of authority having jurisdiction.
- .2 Provide proof of Contractor's General and Environmental Liability Insurance.
- .3 Quality Control:
- .1 Provide Departmental Representative necessary permits for transportation and disposal of lead based paint waste and proof that lead based paint waste has been received and properly disposed of.
- .2 Provide proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead exposure, respirator use, dress, and aspects of work procedures and protective measures.

1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to lead paint, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
- .1 Safety Requirements: worker and visitor protection.
- .1 Protective equipment and clothing to be worn by workers and visitors in Work Area include:

1.6 QUALITY ASSURANCE
(Cont'd)

.2

(Cont'd)

.1 (Cont'd)

- .1 Respirator NIOSH approved and equipped with replaceable HEPA filter cartridges with an assigned protection factor of 10, acceptable to Authority having jurisdiction. Suitable for type of lead and level of lead dust exposure. Provide sufficient amount of filters.
- .2 Half mask respirator: half-mask particulate respirator with N, R, or P - series filter, and 95, 99, or 100 % efficiency could be provided.
- .2 Eating, drinking, chewing, and smoking are not permitted in work area.
- .3 Ensure workers wash hands and face when leaving work area. Facilities for washing will be provided within or close to the Work Area.
- .4 Visitor Protection:
 - .1 Provide approved respirators to Authorized Visitors to work areas.
 - .2 Instruct Authorized Visitors procedures to be followed in entering and exiting work area.

1.7 WASTE MANAGEMENT
AND DISPOSAL

.1

Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

.2

Disposal of lead waste generated by removal activities must comply with Federal, Provincial, and Municipal regulations. Dispose of lead waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.

.3

Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.8 EXISTING CONDITIONS

- .1 Reports and information pertaining to lead based paint to be handled, removed, or otherwise disturbed and disposed of during this Project are available for inspection from Departmental Representative.
- .2 Notify Departmental Representative of lead based paint discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.9 SCHEDULING

- .1 Not later than two days before beginning Work on this Project notify following in writing, where appropriate:
 - .1 appropriate Regional or Zone Director of Medical Services Branch, Health Canada;
 - .2 provincial Ministry of Labour;
 - .3 disposal authority.
- .2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.
- .3 Provide Departmental Representative copy of notifications prior to start of Work.

1.10 PERSONNEL TRAINING

- .1 Provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of lead exposure, in personal hygiene, in aspects of work procedures, and in use, cleaning, and disposal of respirators.
- .2 Instruction and training related to respirators includes, at minimum:
 - .1 proper fitting of equipment;
 - .2 inspection and maintenance of equipment;
 - .3 disinfecting of equipment; and
 - .4 limitations of equipment.

1.10 PERSONNEL TRAINING
(Cont'd)

- .3 Instruction and training must be provided by competent, qualified person.
- .4 Supervisory personnel to complete required training.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Polyethylene:
 - .1 Polyethylene, 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
- .2 Tape:
 - .1 Fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.
- .3 Slow - drying sealer:
 - .1 Non-staining, clear, water - dispersible type that remains tacky on surface for at least eight (8) hours and designed for purpose of trapping residual lead paint residue.
- .4 Lead waste containers:
 - .1 Metal or fibre type acceptable to dump operator with tightly fitting covers and 0.15 mm thickness sealable polyethylene liners.
 - .2 Label containers with pre-printed bilingual cautionary Warning Lead clearly visible when ready for removal to disposal site.

PART 3 - EXECUTION

3.1 SUPERVISION

- .1 One (1) Supervisor for every ten (10) workers is required.
- .2 Supervisor must remain within work area during disturbance, removal, or handling of lead based paints.

3.2 PREPARATION

- .1 Remove and store items to be salvaged or reused.
 - .1 Protect and wrap items and transport and store in area specified by Departmental Representative.
- .2 Work Area:
 - .1 Shut off and isolate HVAC system to prevent dust dispersal into other building areas. Conduct smoke tests to ensure duct work is airtight.
 - .2 Pre-clean fixed casework and equipment within work area, using HEPA vacuum and cover and seal with polyethylene sheeting and tape.
 - .3 Clean work area using HEPA vacuum. If not practicable, use wet cleaning method. Do not raise dust.
 - .4 Seal off openings with polyethylene sheeting and seal with tape.
 - .5 Protect floor surfaces covered from wall to wall with polyethylene sheets.
 - .6 Maintain emergency fire exits or establish alternatives satisfactory to Authority having jurisdiction.
 - .7 Where water application is required for wetting lead containing materials, provide temporary water supply appropriately sized hoses for application of water as required.
 - .8 Provide electrical power and shut off for operation of powered tools and equipment. Provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.
- .3 Do not start work until:
 - .1 Arrangements have been made for disposal of waste.
 - .2 Tools, equipment, and materials waste containers are on site.

3.2 PREPARATION
(Cont'd)

- .3 (Cont'd)
- .3 Arrangements have been made for building security.
- .4 Notifications have been completed and preparatory steps have been taken.

3.3 LEAD ABATEMENT

- .1 Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap; or removal equipped with HEPA filters; or removal with using power tools non-powered hand tool, other than manual scraping and sanding.
- .2 Remove lead based paint in small sections and pack as it is being removed in sealable 0.15 mm plastic bags and place in labelled containers for transport.
- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers thoroughly pending removal to outside. Ensure containers are removed by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.
- .5 After wire brushing and wet sponging to remove visible lead based paint, and after encapsulating lead containing material impossible to remove, wet clean entire work area, and equipment used in process. After inspection by Departmental Representative apply continuous coat of slow drying sealer to surfaces of work area. Do not disturb work area for eight (8) hours no entry, activity, ventilation, or disturbance during this period.

3.4 INSPECTION

- .1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from these requirements not approved in writing by Departmental Representative will result in work stoppage, at no cost to Owner.
- .2 Departmental Representative will inspect work for:
- .1 adherence to specific procedures and materials;

3.4 INSPECTION
(Cont'd)

- .2 (Cont'd)
- .2 final cleanliness and completion; and
- .3 no additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.5 LEAD SURFACE
SAMPLING - WORK AREAS

- .1 Final lead surface sampling to be conducted as follows:
- .1 After work area has passed a visual inspection for cleanliness approved and accepted by Departmental Representative. Apply coat of lock-down agent to surfaces within enclosure, and appropriate setting period of eight (8) hours has passed, Departmental Representative will perform lead wipe sampling.
- .1 Final lead wipe sampling results from horizontal and vertical surfaces must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples collected and analyzed in accordance with EPA 747-R-95-007.
- .2 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.
- .3 Repeat as necessary until fibre levels are less than 40 micrograms per square foot.

3.6 FINAL CLEANUP

- .1 Following cleaning and when lead wipe surfaces sampling are below acceptable concentrations, proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.
- .3 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .4 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

3.7 RE-ESTABLISHMENT OF <u>OBJECTS AND SYSTEMS</u>	.1	Repair or replace objects damaged in course of work to their original state or better, as directed by Departmental Representative.
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PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - General Instructions.
- .2 Section 01 35 73 - Confined Spaces Requirements.
- .3 Section 02 81 01 - Hazardous Materials.
- .4 Section 02 82 00.01 - Asbestos Abatement - Type I.
- .5 Section 02 82 00.02 - Asbestos Abatement - Type II.
- .6 Section 02 82 00.03 - Asbestos Abatement - Type III.
- .7 Section 02 83 10 - Lead - Base Paint Abatement Type 1.
- .8 Section 02 83 12 - Lead - Base Paint Abatement Type 3.
- .9 Section 02 84 00 - Polychlorinate Biphenyl Remediation.
- .10 Section 02 85 00.01 - Remediation of Small Scale Mould Growth.
- .11 Section 02 85 00.02 - Remediation of Medium Scale Mould Growth.
- .12 Section 02 85 00.03 - Remediation of Large Scale Mould Growth.

1.2 SUMMARY

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removal of lead based paint from walls, ceilings or as indicated on drawings by scraping or sanding using non-powered hand tools.
 - .2 Manual demolition of lead-painted plaster walls or building components by striking wall with sledge hammer or similar tool.

1.3 REFERENCES

- .1 Department of Justice Canada (JUS)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Health Canada

1.3 REFERENCES

(Cont'd)

- .2 (Cont'd)
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .3 Human Resources and Social Development Canada (HRSDC)
 - .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.
- .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .5 Underwriters' Laboratories of Canada (ULC)
- .6 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH)
 - .1 NIOSH METHODS, NIOSH Manual of Analytical Methods (NMAM).
- .7 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances
 - .1 Lead in Construction Regulation - 29 CFR 1926.62.
- .8 U.S. Environmental Protection Agency (EPA)
 - .1 EPA 747-R-95-007, Sampling House Dust for Lead.
- .9 Province of Nova Scotia
 - .1 Occupational Health and Safety Act, S.N.S.

1.4 DEFINITIONS

- .1 HEPA vacuum:
 - .1 High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97 % efficiency.
- .2 Authorized Visitors:

1.4 DEFINITIONS

(Cont'd)

- .2 (Cont'd)
 - .1 Owner, Departmental Representative or designated representatives and representatives of regulatory agencies.
 - .3 Occupied Area:
 - .1 Areas of building or work site that is outside Work Area.
 - .4 Sprayer:
 - .1 Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.
 - .5 Airlock:
 - .1 Ingress or egress system, without permitting air movement between contaminated area and uncontaminated area. Consisting of two curtained doorways at least 2 m apart.
 - .6 Curtained doorway:
 - .1 Arrangement of closures to allow ingress and egress from one room to another. Typically constructed as follows:
 - .1 Place two (2) overlapping polyethylene sheets over existing or temporarily framed doorway, securing each along top of doorway, securing vertical edge of one (1) sheet along one (1) vertical side of doorway, and secure other sheet along opposite vertical side of doorway.
 - .2 Reinforce free edges of polyethylene with duct tape and add weight to bottom edge to ensure proper closing.
 - .3 Overlap each polyethylene sheet at openings 1.5 m on each side.
 - .7 Action level:

1.4 DEFINITIONS
(Cont'd)

- .7 (Cont'd)
- .1 Employee exposure, without regard to usage of respirators, to an airborne concentration of lead of 50 micrograms per cubic meter of air calculated as eight (8) hour time-weighted average (TWA). Intermediate precautions for lead abatement are based on airborne lead concentrations greater than 0.05 milligrams per cubic meter of air within Work Area.
- .8 Competent person:
- .1 Individuals, Departmental Representative or representatives capable of identifying existing lead hazards in workplace and taking corrective measures to eliminate them.
- .9 Lead in dust:
- .1 Wipe sampling on vertical and/or horizontal surfaces, dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot.

1.5 SUBMITTALS

- .1 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of authority having jurisdiction.
- .2 Provide: Provincial and local requirements for Notice of Project Form.
- .3 Provide proof of Contractor's General and Environmental Liability Insurance.
- .4 Quality Control:
- .1 Provide Departmental Representative necessary permits for transportation and disposal of lead based paint waste and proof that it has been received and properly disposed.

1.5 SUBMITTALS
(Cont'd)

- .4 (Cont'd)
 - .2 Provide proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead exposure, respirator use, dress, entry and exit from Work Area, and aspects of work procedures and protective measures.
 - .3 Provide proof that supervisory personnel have attended lead abatement course, of not less than two (2) days duration, approved by Departmental Representative. Minimum of one (1) supervisor for every ten (10) workers.
- .5 Product data:
 - .1 Provide documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:
 - .1 encapsulants;
 - .2 amended water; and
 - .3 slow drying sealer.

1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to lead paint, in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
 - .1 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers and visitors in Work Area includes:

1.6 QUALITY ASSURANCE
(Cont'd)

.2

(Cont'd)

.1

(Cont'd)

.1

Respirator NIOSH approved and equipped with filter cartridges with assigned protection factor of 50, acceptable to Authority having jurisdiction. Suitable for type of lead and level of lead dust exposure in Lead Work Area. Provide sufficient filters so workers can install new filters following disposal of used filters and before re-entering contaminated areas.

.2

Disposable type protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

.2

Requirements for workers:

.1

Remove street clothes in clean change room and put on respirator with new filters or reusable filters, clean coveralls and head covers before entering Equipment and Access Rooms or Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.

.2

Remove gross contamination from clothing before leaving work area. Place contaminated work suits in receptacles for disposal with other lead - contaminated materials. Leave reusable items except respirator in Equipment and Access Room. When not in use in Work Area, store work footwear in Equipment and Access Room. Upon completion of lead abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from Work Area or from Equipment and Access Room.

1.6 QUALITY ASSURANCE
(Cont'd)

.2

(Cont'd)

.1

(Cont'd)

.3

Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers not to use this system as means to leave or enter work area.

.3

Eating, drinking, chewing, and smoking are not permitted in work area.

.4

Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual lead abatement.

.5

Ensure workers wash hands and face when leaving Work Area. Facilities for washing will be provided within or close to the Work Area.

.6

Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.

.7

Ensure no person required to enter Work Area has facial hair that affects seal between respirator and face.

.2

Visitor Protection:

.1

Provide protective clothing and approved respirators to Authorized Visitors to Work Areas.

.2

Instruct Authorized Visitors in use of protective clothing, respirators and procedures.

.3

Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Work Area.

1.7 WASTE MANAGEMENT
AND DISPOSAL

.1

Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

1.7 WASTE MANAGEMENT
AND DISPOSAL
(Cont'd)

- .2 Disposal of lead waste generated by removal activities must comply with Federal, Provincial, and Municipal regulations. Dispose of lead waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.
- .3 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.8 EXISTING CONDITIONS

- .1 Reports and information pertaining to lead based paint to be handled, removed, or otherwise disturbed and disposed of during this Project are available for inspection from Departmental Representative.
- .2 Notify Departmental Representative of lead based paint discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.9 SCHEDULING

- .1 Not later than two days before beginning Work on this Project notify the following in writing, where appropriate:
 - .1 appropriate Regional or Zone Director of Medical Services Branch, Health Canada;
 - .2 provincial Ministry of Labour;
 - .3 disposal authority.
- .2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.
- .3 Provide Departmental Representative copy of notifications prior to start of Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Polyethylene:
 - .1 Polyethylene, 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.

2.1 MATERIALS
(Cont'd)

- .2 FR polyethylene:
 - .1 FR polyethylene, 0.15 mm woven fibre reinforced fabric bonded both sides with polyethylene.
- .3 Tape:
 - .1 Fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.
- .4 Slow - drying sealer:
 - .1 Non-staining, clear, water - dispersible type that remains tacky on surface for at least eight (8) hours and designed for trapping residual lead paint residue.
- .5 Lead waste containers:
 - .1 Metal or fibre type acceptable to dump operator with tightly fitting covers and 0.15 mm thickness sealable polyethylene liners.
 - .2 Label containers with pre-printed bilingual cautionary Warning Lead clearly visible when ready for removal to disposal site.

PART 3 - EXECUTION

3.1 SUPERVISION

- .1 Approved Supervisor must remain within Lead Work Area during disturbance, removal, or other handling of lead based paints.

3.2 PREPARATION

- .1 Remove and wrap items to be salvaged or reused, and transport and store in area specified by Departmental Representative.
- .2 Work Area:
 - .1 Shut off and isolate HVAC system to prevent dust dispersal into other building areas. Conduct smoke tests to ensure duct work is airtight.

3.2 PREPARATION
(Cont'd)

.2

(Cont'd)

- .2 Pre-clean fixed casework and equipment within work area, using HEPA vacuum and cover and seal with polyethylene sheeting and tape.
- .3 Clean work areas using HEPA vacuum. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum.
- .4 Seal off openings, corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
- .5 Cover floor surfaces in work area from wall to wall with FR polyethylene drop sheets to protect existing floor during removal.
- .6 Build airlocks at entrances and exits from work areas to ensure work areas are always closed off by one curtained doorway when workers enter or exit.
- .7 At point of access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used:
 - .1 CAUTION LEAD HAZARD AREA (25 mm);
 - .2 NO UNAUTHORIZED ENTRY (19 mm);
 - .3 WEAR ASSIGNED PROTECTIVE EQUIPMENT AND RESPIRATOR (19 mm);
 - .4 BREATHING LEAD CONTAMINATED DUST CAUSES SERIOUS BODILY HARM (7 mm).
- .8 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Authority having jurisdiction.
- .9 Where water application is required for wetting lead containing materials, provide temporary water supply appropriately sized hoses for application of water as required.

3.2 PREPARATION
(Cont'd)

- .2 (Cont'd)
 - .10 Provide electrical power and shut off for operation of powered tools and equipment. Provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.
- .3 Worker Decontamination Enclosure System:
 - .1 Worker Decontamination Enclosure System includes Equipment and Access Room and Clean Room, as follows:
 - .1 Equipment and Access Room:
 - .1 Construct between exit and work areas, with two curtained doorways, one to the rest of suite, and one to work area. Install waste receptor and storage facilities for workers' shoes and protective clothing to be re-worn in work areas. Build large enough to accommodate specified facilities, equipment needed, and at least one worker allowing sufficient space to change comfortably.
 - .2 Clean Room:
 - .1 Construct with curtained doorway to outside of enclosures. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.
- .4 Construction of Decontamination Enclosures:
 - .1 Construct framing for enclosures or use existing rooms. Line enclosure with polyethylene sheeting and seal with tape, apply two (2) layers of FR polyethylene on floor.
 - .2 Construct curtain doorways between enclosures so when people move through or waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.

3.2 PREPARATION
(Cont'd)

- .5 Separation of Work Areas from Occupied Areas:
 - .1 Barriers between Work Area and occupied area to be constructed as follows:
 - .1 Construct floor to ceiling lumber or metal stud framing, over with polyethylene sheeting and seal with duct tape. Apply plywood over polyethylene sheeting. Seal plywood joints and between adjacent materials with surface film forming sealer, to create airtight barrier.
 - .2 Cover plywood with polyethylene sheeting and sealed with duct tape.
- .6 Maintenance of Enclosures:
 - .1 Maintain enclosures in clean condition.
 - .2 Ensure barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately.
 - .3 Visually inspect enclosures at beginning of each work day.
 - .4 Use smoke test method to test effectiveness of barriers as directed by Departmental Representative.

3.3 LEAD - BASE PAINT
ABATEMENT

- .1 Removal of lead based paint to be performed by scraping or sanding using non-powered hand tools, or manual demolition of lead-painted plaster walls or building components by striking a wall with sledgehammer or similar tool.
- .2 Remove lead based paint in small sections and pack as it is being removed in sealable 0.15 mm plastic bags and place in labelled containers for transport.

3.3 LEAD - BASE PAINT
ABATEMENT
(Cont'd)

- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.
- .5 After wire brushing and wet sponging to remove visible lead based paint, and after encapsulating lead containing material impossible to remove, wet clean work area including equipment and access room, and equipment used in process. After inspection by Departmental Representative, apply continuous coat of slow drying sealer to surfaces. Do not disturb work for eight (8) hours with no entry, activity, ventilation or disturbance during this period.
- .6 After enclosing lead painted surfaces, wet clean work area and equipment and access room. During settling period no entry, activity, or ventilation will be permitted.

3.4 INSPECTION

- .1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from these requirements not approved in writing by Departmental Representative will result in work stoppage, at no cost to Owner.
- .2 Departmental Representative will inspect work for:
 - .1 adherence to specific procedures and materials;
 - .2 final cleanliness and completion; and
 - .3 no additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.
- .3 When lead dust leakage from Work Area occurs Departmental Representative may order Work shutdown.

3.4 INSPECTION
(Cont'd)

- .3 (Cont'd)
- .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.5 LEAD SURFACE
SAMPLING - WORK AREAS

- .1 Final lead surface sampling to be conducted as follows:
- .1 After Work Area has passed a visual inspection for cleanliness inspection for cleanliness approved by Departmental Representative and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period of eight (8) hours has passed. Testing agency will perform lead wipe sampling in Work Area.
- .1 Final lead wipe sampling results from horizontal and vertical surfaces where lead based paints have been removed must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples must be collected and analyzed in accordance with EPA 747-R-95-007.
- .2 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.
- .3 Repeat as necessary until fibre levels are less than 40 micrograms per square foot.

3.6 FINAL CLEANUP

- .1 Following specified cleaning procedures, and when lead wipe sampling is below acceptable concentrations proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum equipment.
- .3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.

3.6 FINAL CLEANUP
(Cont'd)

- .4 Clean-up Work Areas, Equipment and Access Room, and other contaminated enclosures.
- .5 Clean-up sealed waste containers and equipment used in Work and remove from work areas, via Container and Equipment Decontamination Enclosure System, at appropriate time in cleaning sequence.
- .6 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

3.7 RE-ESTABLISHMENT OF
OBJECTS AND SYSTEMS

- .1 Repair or replace objects damaged in course of work to their original state or better, as directed by Departmental Representative.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - General Instructions.
- .8 Section 01 25 72 - Confined Spaces Requirements.
- .2 Section 08 31 01 - Hazardous Materials.
- .4 Section 08 38 00.01 - Asbestos Abatement - Type I.
- .5 Section 08 38 00.08 - Asbestos Abatement - Type II.
- .6 Section 08 38 00.02 - Asbestos Abatement - Type III.
- .7 Section 08 32 10 - Lead - Base Paint Abatement Type 1.
- .3 Section 08 32 11 - Lead - Base Paint Abatement Type 8.
- .9 Section 08 34 00 - Polychlorinate Biphenyl Remediation.
- .10 Section 08 35 00.01 - Remediation of Small Scale Mould Growth.
- .11 Section 08 35 00.08 - Remediation of Medium Scale Mould Growth.
- .18 Section 08 35 00.02 - Remediation of Large Scale Mould Growth.

1.8 SUMMARY

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removal of lead based paint from walls, ceilings or as indicated on drawings by scraping or sanding using power tools with an effective dust collection system equipped with HEPA filter.
 - .8 Abrasive blasting of lead based paint on walls, ceilings or as indicated.
 - .2 Removal of lead-containing dust using air mist extraction system.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)

1.2 REFERENCES

(Cont'd)

- .1 (Cont'd)
 - .1 CAN/CSA-130.1, Compressed Breathing Air and Systems.
- .8 Department of Justice Canada (JUS)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Health Canada
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .4 Human Resources and Social Development Canada (HRSDC)
 - .1 Canada Labour Code Part II, - SOR 36-204 - Occupational Health and Safety Regulations.
- .5 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1998 (TDGA).
- .6 Underwriters' Laboratories of Canada (ULC)
- .7 U.S. Department of Health and Human Services / Centers for Disease Control and Prevention / National Institute for Occupational Safety and Health (NIOSH)
 - .1 NIOSH METHODS, NIOSH Manual of Analytical Methods (NMAM).
- .3 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances
 - .1 Lead in Construction Regulation - 89 CFR 1986.68.
- .9 U.S. Environmental Protection Agency (EPA)
 - .1 EPA 747-R-95-007, Sampling House Dust for Lead.
- .10 Province of Nova Scotia
 - .1 Occupational Health and Safety Act, S.N.S.

1.4 DEFINITIONS

- .1 HEPA vacuum:

1.4 DEFINITIONS
(Cont'd)

- .1 (Cont'd)
 - .1 High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.2 microns in any direction at 99.97 % efficiency.
- .8 Authorized visitors:
 - .1 Owner, Departmental Representative or designated representatives and representatives of regulatory agencies.
- .2 Occupied Area:
 - .1 Areas of building or work site that is outside Work Area.
- .4 Dioctyl Phthalate (DOP) Test:
 - .1 Testing method used to evaluate particle penetration and air flow resistance properties of filtration materials - HEPA filter leak test.
- .5 Sprayer:
 - .1 Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Appropriate capacity for scope of work.
- .6 Airlock:
 - .1 Ingress or egress system without permitting air movement between contaminated area and uncontaminated area. Consisting of two curtained doorways at least 8 m apart.
- .7 Curtained doorway:
 - .1 Arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:

1.4 DEFINITIONS
(Cont'd)

.7 (Cont'd)

.1 (Cont'd)

.1 Place two (8) overlapping polyethylene sheets over existing or temporarily framed doorway, securing each along top of doorway, securing vertical edge of one (1) sheet along one (1) vertical side of doorway, and secure other sheet along opposite vertical side of doorway.

.8 Reinforce free edges of polyethylene with duct tape and add weight to bottom edge to ensure proper closing.

.2 Overlap each polyethylene sheet at openings 1.5 m on each side.

.3 Action level:

.1 Employee exposure, without regard to usage of respirators, to an airborne concentration of lead of 50 micrograms per cubic metre of air calculated as an 3-hour time-weighted average (TWA). Maximum precautions for lead abatement are based on airborne lead concentrations greater than 1.85 milligrams per cubic meter of air within Work Area.

.9 Competent person:

.1 Individuals, Departmental Representative or representatives capable of identifying existing lead hazards in workplace and taking corrective measures to eliminate them.

.10 Lead in dust:

.1 Wipe sampling on vertical and/or horizontal surfaces, dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot.

.11 Negative air pressure machine:

.1 Extracts air directly from work area and filters extracted air through a HEPA filter, discharge air to exterior of building.

1.4 DEFINITIONS
(Cont'd)

- .11 (Cont'd)
- .8 Maintain pressure differential of 5 to 7 Pa relative to adjacent areas outside of work areas. Machine to be equipped with alarm to warn of system breakdown, and equipped with instrument to continuously monitor and automatically record pressure differences.

1.5 SUBMITTALS

- .1 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of authority having jurisdiction.
- .8 Provide: Provincial and local requirements for Notice of Project Form.
- .2 Provide proof of Contractor's General and Environmental Liability Insurance.
- .4 ; uality Control:
- .1 Provide Departmental Representative necessary permits for transportation and disposal of lead based paint waste and proof that it has been received and properly disposed.
- .8 Provide proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead exposure, respirator use, dress, entry and exit from Work Area, and aspects of work procedures and protective measures.
- .2 Provide proof that supervisory personnel have attended lead abatement course, of not less than two (8) days duration, approved by Departmental Representative. Minimum of one (1) supervisor for every ten (10) workers.
- .5 Product data:
- .1 Provide documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:
- .1 encapsulantsX
- .8 amended waterXand

1.5 SUBMITTALS
(Cont'd)

- .5 (Cont'd)
 - .1 (Cont'd)
 - .2 slow drying sealer.

1.6 ; UALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Comply with Federal, Provincial and local requirements pertaining to lead, in case of conflict among those requirements or with these specifications the more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .8 Health and Safety:
 - .1 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers while in Lead Work Area includes:
 - .1 Leads removal using power tool:
 - .1 Respirator NIOSH approved and equipped with filter cartridges with assigned protection factor of 50, acceptable to Authority having Jurisdiction. Suitable for type of lead and level of lead dust exposure in Lead Work Area. Provide sufficient filters so workers can install new filters following disposal of used filters and before re-entering contaminated areas.
 - .8 Abrasive blasting of lead paint:

1.6 ; UALITY ASSURANCE
(Cont'd)

.8

(Cont'd)

.1 (Cont'd)

.1 NIOSH approved and equipped with filter cartridges with assigned protection factor of 1000, acceptable to Authority having Jurisdiction. Suitable for type of lead and level of lead dust exposure in Lead Work Area. Respirator to be equivalent Type CE abrasive blast supplied air respirator operated in a pressure demand or positive pressure mode with a tight-fitting half-mask or full-face-piece. Compressed air used to supply supplied air respirators to meet breathing air purity requirements of CAN/CSA-130.1. Where an oil-lubricated compressor is used to supply breathing air, a continuous carbon monoxide monitor/alarm to be provided.

.2 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

.8 Requirements for workers:

.1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters, clean coveralls and head covers before entering Equipment and Access Rooms or Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.

1.6 ; UALITY ASSURANCE
(Cont'd)

.8

(Cont'd)

.1

(Cont'd)

.8

Remove gross contamination from clothing before leaving work area. Place contaminated work suits in receptacles for disposal with other lead contaminated materials. Leave reusable items except respirator in Equipment and Access Room. When not in use in work area, store work footwear in Equipment and Access Room. Upon completion of lead abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from Equipment and Access Room.

.2

Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers not use this system as means to leave or enter Work Area.

.2

Eating, drinking, chewing, and smoking are not permitted in Work Area.

.4

Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual lead abatement.

.5

Ensure workers wash hands and face when leaving Work Area. Facilities for washing will be provided within or close to the Work Area.

.6

Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.

.7

Ensure no person required to enter Work Area has facial hair that affects seal between respirator and face.

.8

Visitor Protection:

<u>1.6 ; UALITY ASSURANCE (Cont'd)</u>	.8	(Cont'd)
	.8	(Cont'd)
	.1	Provide protective clothing and approved respirators to Authorized j isitors to Work Areas.
	.8	Instruct Authorized j isitors in use of protective clothing, respirators and procedures.
	.2	Instruct Authorized j isitors in proper procedures to be followed in entering into and exiting from Work Area.
<u>1.7 WASTE MANAGEMENT AND DISPOSAL</u>	.1	Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
	.8	Disposal of lead waste generated by removal activities must comply with Federal, Provincial, and Municipal regulations. Dispose of lead waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.
	.2	Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.
<u>1.3 EZISTING CONDITIONS</u>	.1	Reports and information pertaining to lead based paint to be handled, removed, or otherwise disturbed and disposed of during this Pro@ct are available for inspection from Departmental Representative.
	.8	Notify Departmental Representative of lead based paint discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.
<u>1.9 SCHEDULING</u>	.1	Not later than two days before beginning Work on this Pro@ct notify the following in writing, where appropriate:
	.1	appropriate Regional or %one Director of Medical Services Branch, Health CanadaX
	.8	provincial Ministry of LabourX
	.2	disposal authority.

1.9 SCHEDULING
(Cont'd)

- .8 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.
- .2 Provide Departmental Representative copy of notifications prior to start of Work.

PART 8 - PRODUCTS

8.1 MATERIALS

- .1 Polyethylene:
 - .1 Polyethylene, 0.15 mm unless otherwise specified in sheet size to minimize joints.
- .8 FR polyethylene:
 - .1 FR polyethylene, 0.15 mm woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Tape:
 - .1 Fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.
- .4 Slow - drying sealer:
 - .1 Non-staining, clear, water - dispersible type that remains tacky on surface for at least 3 hours and designed for trapping residual lead paint residue.
- .5 Lead waste containers:
 - .1 Metal or fibre type acceptable to dump operator with tightly fitting covers and 0.15 mm sealable polyethylene liners.
 - .8 Label containers with pre-printed bilingual cautionary Warning Lead clearly visible when ready for removal to disposal site.

PART 2 - EXECUTION

2.1 SUPERVISION

- .1 Approved Supervisor must remain within Work Area during disturbance, removal, or handling of lead based paints.

2.8 PREPARATION

- .1 Remove and wrap items to be salvaged or reused, and transport and store in area specified by Departmental Representative.
- .8 Work Area:
 - .1 Shut off and isolate H₂ AC system to prevent dust dispersal into other building areas. Conduct smoke tests to ensure duct work is airtight.
 - .8 Pre-clean fixed casework and equipment within work area, using HEPA vacuum and cover and seal with polyethylene sheeting and tape.
 - .2 Clean work areas using HEPA vacuum. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum.
 - .4 Install negative pressure machine system and operate continuously from installation of polyethylene sheeting until completion of final cleanup. Provide automatic continuous monitoring and recording instrument of pressure difference.
 - .5 Seal off openings, corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
 - .6 Cover floor surfaces in work area from wall to wall with FR polyethylene drop sheets to protect existing floor during removal.
 - .7 Build airlocks at entrances and exits from work areas to ensure work areas are always closed off by one curtained doorway when workers enter or exit.

2.8 PREPARATION
(Cont'd)

.8 (Cont'd)

.7 (Cont'd)

.1 At point of access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used:

.1 CAUTION LEAD HAZARD AREA (85 mm)X

.8 NO UNAUTHORIZED ENTRY (19 mm)X

.2 WEAR ASSIGNED PROTECTIVE EQUIPMENT AND RESPIRATOR (19 mm)X

.4 BREATHING LEAD CONTAMINATED DUST CAUSES SERIOUS BODILY HARM (7 mm).

.3 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Authority having jurisdiction.

.9 Where water application is required for wetting lead containing materials, provide temporary water supply appropriately sized hoses for application of water as required.

.10 Provide electrical power and shut off for operation of powered tools and equipment. Provide 84 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.

.2 Worker Decontamination Enclosure System:

.1 Worker Decontamination Enclosure System includes Equipment and Access Room and Clean Room, as follows:

.1 Equipment and Access Room:

2.8 PREPARATION
(Cont'd)

.2 (Cont'd)

.1 (Cont'd)

.1 Construct between exit and work areas, with two (8) curtained doorways, one (1) to the rest of suite, and one (1) to work area. Install waste receptor and storage facilities for workers' shoes and protective clothing to be re-worn in work areas. Build large enough to accommodate specified facilities, equipment needed, and at least one (1) worker allowing sufficient space to change comfortably.

.8 Clean Room:

.1 Construct with curtained doorway to outside of enclosures. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.

.4 Construction of Decontamination Enclosures:

.1 Construct framing for enclosures or use existing rooms. Line enclosure with polyethylene sheeting and seal with tape, apply two (8) layers of FR polyethylene on floor.

.8 Construct curtain doorways between enclosures so when people move through or waste containers and equipment are moved through doorway, one of two (8) closures comprising doorway always remains closed.

.2 Shower room in decontamination facility to be provided with the following:

.1 Hot and cold water or water of constant temperature not less than 40 degrees Celsius or more than 50 degrees Celsius. Cold and hot water source will be provided.

.8 Individual controls inside to regulate water flow and temperature.

2.8 PREPARATION
(Cont'd)

- .4 (Cont'd)
- .4 Prior to each shift in which a decontamination facility is being used, a competent person should inspect the facility to ensure that there are no defects that would allow lead-containing dust to escape. Defects should be repaired before the facility is used. The decontamination facility should be maintained in a clean and sanitary condition.
- .5 Separation of Work Areas from Occupied Areas:
- .1 Barriers between Work Area and occupied area to be constructed as follows:
- .1 Construct floor to ceiling lumber or metal stud framing, over with polyethylene sheeting and seal with duct tape. Apply 9 mm thick plywood over polyethylene sheeting. Seal plywood joints and between adjacent materials with surface film forming sealer, to create airtight barrier.
- .8 Cover plywood with polyethylene sheeting and sealed with duct tape.
- .6 Maintenance of Enclosures:
- .1 Maintain enclosures in tidy condition.
- .8 Ensure barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately.
- .2 Usually inspect enclosures at beginning of each working day.
- .4 Use smoke test method to test effectiveness of barriers as directed by Departmental Representative.

2.2 LEAD - BASE PAINT
ABATEMENT

- .1 Removal of lead based paint to be performed using power tools that are attached to dust-collecting vacuums with HEPA filters.
- .8 Remove lead based paint in small sections and pack as it is being removed in sealable 0.15 mm plastic bags and place in labelled containers for transport.

2.2 LEAD - BASE PAINT
ABATEMENT
(Cont'd)

- .2 Wet method to be used to reduce dust generation. Examples of wet methods include wetting surfaces, wet scraping, and wet shovelling. Wet method not be used if it creates a hazard or cause damage to equipment or to protect. Power tools to be equipped with a shroud, and to be kept flush with surface.
- .4 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove immediate from working area to staging area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .5 After completion of stripping work, wire brush and wet sponge surface to remove visible material. During this work keep surfaces wet. After wire brushing and wet sponging, wet clean and HEPA vacuum entire work area including Equipment and Access Room. Compressed air or dry sweeping not be used to clean up lead-containing dust or waste. After inspection and approval by Departmental Representative apply continuous coat of slow drying sealer to surfaces. Do not disturb work area for 3 hours, no entry, activity, or ventilation other than operation negative air machine during this period.
- .6 After enclosing lead painted surfaces, wet clean work area and equipment and access room. During settling period no entry, activity, or ventilation will be permitted.

2.4 INSPECTION

- .1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from requirements not been approved in writing by Departmental Representative will result in Work shutdown, at no cost to Owner.
- .8 Departmental Representative will inspect work for:
 - .1 adherence to specific procedures and materialsX
 - .8 final cleanliness and completionXand

2.4 INSPECTION
(Cont'd)

- .8 (Cont'd)
 - .2 no additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.
- .2 When lead dust leakage from Work Area occurs Departmental Representative will order Work shutdown.
 - .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

2.5 LEAD SURFACE
SAMPLING - WORK AREAS

- .1 Final lead surface sampling conducted as follows:
 - .1 After Work Area has passed a visual inspection for cleanliness approved by Departmental Representative and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period of eight (3) hours has passed. Testing agency will perform lead wipe sampling in Work Area.
 - .1 Final lead wipe sampling results from horizontal and vertical surfaces where lead based paints have been removed must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples must be collected and analyzed in accordance with EPA 747-R-95-007.
 - .8 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.
 - .2 Repeat as necessary until fibre levels are less than 40 micrograms per square foot.

2.6 FINAL CLEANUP

- .1 Following specified cleaning procedures, and when lead wipe sampling is below acceptable concentrations proceed with final cleanup.
- .8 Remove polyethylene sheet by rolling it away from walls to centre of work area. j acuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.

2.6 FINAL CLEANUP
(Cont'd)

- .2 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .4 Clean up Work areas, Equipment and Access Room, and other contaminated enclosures.
- .5 Remove sealed waste containers and equipment used in Work and remove from work areas at appropriate time in cleaning sequence.
- .6 Conduct final check to ensure no dust or debris remain on surfaces as result of dismantling operations.

2.7 RE-ESTABLISHMENT OF
OBJECTS AND SYSTEMS

- .1 Repair or replace objects damaged in course of work to their original state or better, as directed by Departmental Representative.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - General Instructions.
- .2 Section 01 35 73 - Confined Spaces Requirements.
- .3 Section 02 81 01 - Hazardous Materials.
- .4 Section 02 82 00.01 - Asbestos Abatement - Type I.
- .5 Section 02 82 00.02 - Asbestos Abatement - Type II.
- .6 Section 02 82 00.03 - Asbestos Abatement - Type III.
- .7 Section 02 83 10 - Lead - Base Paint Abatement Type 1.
- .8 Section 02 83 11 - Lead - Base Paint Abatement Type 2.
- .9 Section 02 83 12 - Lead - Base Paint Abatement Type 3.
- .10 Section 02 85 00.01 - Remediation of Small Scale Mould Growth.
- .11 Section 02 85 00.02 - Remediation of Medium Scale Mould Growth.
- .12 Section 02 85 00.03 - Remediation of Large Scale Mould Growth.

1.2 REFERENCES

- .1 American Board of Industrial Hygiene (ABIH)
- .2 Canadian Council of Ministers of the Environment (CCME)
 - .1 PN1205-1995, PCB Transformer Decontamination: Standards and Protocols.
- .3 Department of Justice Canada (Jus) /CEPA
SOR/92-507-SOR/2008-273, PCB Regulations
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .4 Environment Canada
 - .1 Manual for Spills of Hazardous Materials-1985.
- .5 National Research Council Canada (NRC)

1.2 REFERENCES

(Cont'd)

- .5 (Cont'd)
 - .1 National Fire Code of Canada (NFC).
- .6 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .7 Chlorobiphenyls Regulations (SOR/91-152; Amended SOR/2000-102)
 - .1 Regulations Respecting Mobile System for the Destruction and Treatment of Chlorobiphenyls that are Operated by or Under Contract with Federal Institutions (SOR/90-5; amended SOR/93-231 and SOR/2000-105).
 - .2 Regulations Respecting the Storage of Material Containing Chlorobiphenyls (PCBs) SOR/92-507, Amended SOR/2000-102).
 - .3 Regulations Respecting the Import and Export of Hazardous Wastes (SOR/92-637; Amended 94-459; SOR 94-684; SOR/2000-103).
 - .4 Waste Management - PCBs, R.R.O. Regulation 362/90.
 - .5 Mobile PCB Destruction Facilities, R.R.O. Regulation 352/90.
 - .6 Regulation 347, General Waste Management, as Amended.

1.3 SUBMITTALS

- .1 Prior to starting work, Contractor performing work of this section to provide, where appropriate:
 - .1 Workplace Safety and Insurance Board Clearance Certificate;
 - .2 insurance certificates;
 - .3 company health and safety policy;
 - .4 certificate of approval for transportation of PCB Waste and location of destruction facility;
 - .5 WHMIS training certificates for personnel; and

1.3 SUBMITTALS
(Cont'd)

- .1 (Cont'd)
- .6 Material Safety Data Sheets for chemicals or material to be used.
- .2 Submittals to DND Fire Department and Departmental Representative.
 - .1 2 copies of books and records listed under Record Keeping of Control Submittals Article in PART 1 of this Section.
- .3 Waste location and description including:
 - .1 building in which PCB waste is stored;
 - .2 size of property used for storage site;
 - .3 precise location of PCB waste at storage site;
 - .4 container storage method used;
 - .5 spill containment features in place at storage site;
 - .6 security measures in place at storage site; and
 - .7 fire detection systems in place at storage site.

1.4 CONTROL SUBMITTALS

- .1 Record keeping: maintain and make available for review by environmental officer and Departmental Representative.
 - .1 Receipt of waste showing:
 - .1 date of receipt of waste;
 - .2 description of PCB waste including nameplate description, serial number, PCB registration number and quantity;
 - .3 condition of PCB waste;
 - .4 source of PCB waste;
 - .5 name of carrier of PCB waste; and

1.4 CONTROL SUBMITTALS
(Cont'd)

- .1 (Cont'd)
 - .1 (Cont'd)
 - .6 name of individual who accepted receipt of PCB waste.
 - .2 Removal of waste showing:
 - .1 date of removal of PCB waste;
 - .2 description of PCB waste including nameplate description, serial number, PCB registration number and quantity;
 - .3 condition of PCB waste;
 - .4 name of carrier of PCB waste;
 - .5 destination of PCB waste; and
 - .6 name of individual authorizing transport of PCB waste.
 - .3 Monthly inspection, repair and replacement reports.
 - .4 Submit records to Departmental Representative as requested.

1.5 QUALITY ASSURANCE

- .1 Instruct personnel on dangers of PCB exposure, respirator use, decontamination and applicable Federal, Provincial and Municipal Regulations.
- .2 Obtain services of industrial hygienist certified by American Board of Industrial Hygiene to certify training, review and approve PCB removal plan, including determination of need for personnel protective equipment (PPE) in performing PCB removal work.
- .3 Complete work so that at no time do PCB's contaminate building, site and environment.

1.6 SUPERVISION

- .1 Provide on site, a supervisor, with authority to oversee health and safety, remediation methods, scheduling, labour and equipment requirements.

1.6 SUPERVISION
(Cont'd)

- .2 One (1) supervisor for every ten (10) workers is required.

1.7 DELIVERY, STORAGE
AND HANDLING

- .1 Place materials defined as hazardous or toxic in designated containers.
- .2 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .3 Owners or operators of storage sites:
- .1 Provide method for determining concentration of PCBs in particular waste at request of environment officer or inspector or Departmental Representative.
- .2 Ensure personnel are familiar with and understand current PCB waste management procedures and use of personal protection equipment and clean-up techniques.
- .4 Disposal of PCB waste generated by removal activities must comply with Federal, Provincial and Municipal regulations.
- .1 Dispose of PCB waste in leak proof drums.
- .2 Containers must be labelled with appropriate warning labels.
- .5 Create manifests describing and listing waste created and transport containers by approved means to licenced facility for storage.
- .1 For each bulk load of PCBs:
- .1 Identity PCB waste, earliest date of removal from service for disposal, and weight in kilograms of the PCB waste.
- .2 For each PCB article container or PCB container:
- .1 Unique identifying number, type of PCB waste (i.e., soil, debris, small capacitors), earliest date of removal from service for disposal, and weight in kilograms of PCB waste contained.

1.7 DELIVERY, STORAGE
AND HANDLING
(Cont'd)

- .5 (Cont'd)
- .3 For each PCB article not in PCB container or PCB article container:
- .1 Serial number if available, or other identification if there is no serial number, date of removal from service for disposal, and weight in kilograms of PCB waste in each PCB article.

PART 2 - PRODUCTS

2.1 STORAGE GENERAL

- .1 Storage of PCB materials in accordance with CEPA SOR/92-507 or Authority having jurisdiction.

2.2 STORAGE ENCLOSURE

- .1 Isolate PCB control area by physical boundaries to prevent unauthorized entry of personnel.
- .2 Food, drink and smoking materials are not permitted in areas where PCBs are handled or PCB items are stored.
- .3 Room, building or structure with lockable entrance.
- .4 Temporary storage facility to be a fully enclosed block wall room within building with appropriate warning signs.
- .5 Woven mesh wire fence or other fence with similar characteristics at least 1.83 metres high, with lockable entrance.
- .6 Smoking is not permitted within 15 m of PCB control area.
- .1 Provide and post "No Smoking" signs as directed by Departmental Representative.

2.3 STORAGE CONTAINERS

- .1 Exterior containers:
- .1 Structurally-sound and weather-sealed to hold PCB solids, PCB light ballasts, drained PCB containers or drained PCB equipment.
- .2 PCB solid and liquid storage:

2.3 STORAGE CONTAINERS
(Cont'd)

- .2 (Cont'd)
 - .1 Drums and containers:
 - .1 Designed with sufficient durability and strength to prevent PCB solids and liquids from being released into environment, affected by weather, or contaminated by external sources.
 - .2 Steel, or other material approved by Departmental Representative.
 - .2 Drums:
 - .1 Capacity no greater than 205 litres.
 - .2 Steel of minimum 1.2 mm for solids and 1.52 mm for liquids.
 - .3 Ensure removable steel lid securely attached and complete with PCB-resistant gasket for solids, closed-head double-bung steel drum.
 - .4 Paint or treat interior and exterior to prevent rusting.
 - .3 Drum Liners:
 - .1 6 mil clear polyethylene bag, 914 mm x 1524 mm, with opening at 914 mm end.

2.4 FLOORING AND
ACCESSORIES

- .1 Constructed of steel, concrete, or other material as approved by Departmental Representative.
- .2 Curbing, sufficient siding to contain at least twice volume of PCB liquid contained in largest item of PCB equipment on site or 25 percent of volume of PCB liquid on site, whichever is greater.
- .3 PCB absorbing surfaces:
 - .1 Floor, curbing, siding, sealed with durable PCB-resistant coating.
- .4 Floor opening, floor drains and sumps:

2.4 FLOORING AND
ACCESSORIES
(Cont'd)

- .4 (Cont'd)
 - .1 Closed and sealed to prevent escape of liquid.
 - .2 Connected to drainage system suitable for liquid dangerous goods that terminates at location where spilled liquids will be contained and recovered and where spilled liquids will not create fire hazard or risk to public health or safety.

2.5 EMERGENCY RESPONSE
EQUIPMENT AND SYSTEM

- .1 Safety requirements in storage area:
 - .1 Heat and smoke sensory controls:
 - .1 Stops ventilation fan and closes intake and exhaust dampers of fan in event of fire inside building.
 - .2 Indoor fire alarm system:
 - .1 Fully operative and maintained, inspected and tested to National Fire Code of Canada.
 - .2 Portable fire extinguishers to be selected, installed, maintained, inspected and tested to National Fire Code of Canada.
 - .3 Automatic fire suppression system, as and when required to National Fire Code of Canada.
- .2 Storage site clean-up materials:
 - .1 Ensure availability at all time of sorbent or solvents, for clean-up of liquid or solids.
 - .2 Ensure availability at all times of inert absorbent in sufficient quantity to contain minor leakage.
 - .1 Place in bottom of each container holding PCB equipment or fluorescent lighting ballasts.
- .3 Respirators:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.

2.5 EMERGENCY RESPONSE
EQUIPMENT AND SYSTEM
(Cont'd)

- .3 (Cont'd)
- .1 (Cont'd)
- .1 Use approved full-face organic vapour cartridge respirator for exposure to hot PCB.
- .2 Vapour concentration less than or equal to 5 mg/m³.
- .3 Supplied-air respirator with full face piece, helmet or hood.
- .4 Self-contained breathing apparatus with full face piece.
- .2 Vapour concentration greater than 5 mg/m³ or unknown concentrations.
- .1 Self-contained breathing apparatus with full face piece operated in positive pressure mode.
- .2 Type C supplied-air respirator with full face piece operated in positive pressure or continuous flow mode and auxiliary self-contained breathing apparatus operated in positive pressure mode.

2.6 WARNING SIGNS AND
LABELS

- .1 Label capacitors containing 0.5 kilogram or more of chlorobiphenyls with black and white serialized label, measuring 76 x 76 mm, as approved by Departmental Representative and in accordance with Manual of Spills of Hazardous Materials.
- .2 Label container with a capacitor containing 0.5 kg or more of chlorobiphenyls with black and white serialized, "ATTENTION PCB" label, measuring 150 x 150 mm, as approved by Departmental Representative and in accordance with Manual of Spills of Hazardous Materials.
- .3 Label electrical transformers, electromagnets and other equipment containing chlorobiphenyls in concentration exceeding 1% with black and white, serialized, "ATTENTION PCB" label, measuring 150 x 150 mm, as approved by Departmental Representative and in accordance with Manual of Spills of Hazardous Materials.

2.6 WARNING SIGNS AND
LABELS
(Cont'd)

- .4 Label equipment and containers of equipment containing chlorobiphenyls in concentration exceeding 50 parts per million by weight but not greater than 1% with non-serialized, Warning Label for PCB-Contaminated Equipment measuring 150 x 150 mm, as approved by Departmental Representative and in accordance with Manual of Spills of Hazardous Materials.
- .5 Label containers of equipment, and drained containers containing chlorobiphenyls in concentration exceeding 1% with non-serialized, black and white, "ATTENTION PCB" label, measuring 150 x 150 mm, as approved by Departmental Representative and in accordance with Manual of Spills of Hazardous Materials.
- .6 Label containers of PCB material and drained containers of PCB material with chlorobiphenyl concentration exceeding 50 parts per million by weight with non-serialized, Warning Label for PCB-Contaminated Equipment measuring 150 x 150 mm as approved by Departmental Representative and in accordance with Manual of Spills of Hazardous Materials.
- .7 Label doors to storage sites, fencing and other security barriers enclosing storage sites with non-serialized, black and white, "ATTENTION PCB" label, measuring 150 x 150 mm as approved by Departmental Representative and in accordance with Manual of Spills of Hazardous Materials.
- .8 Maintain signs and labels in clear and legible condition.

PART 3 - EXECUTION

3.1 GENERAL

- .1 Store PCB waste materials to CEPA SOR/92-507.
- .2 Select PCB removal procedure to minimize contamination of work areas with PCB or other PCB-contaminated debris/waste. Handle PCBs such that no skin contact occurs.
- .3 As feasible, do not carry out PCB handling operations in confined spaces. Confined space means space having limited means of egress and inadequate cross ventilation.

3.1 GENERAL
(Cont'd)

- .4 Ensure that work operations or processes involving PCB or PCB-contaminated materials are conducted in accordance with Federal, Provincial and Municipal Regulations and applicable requirements of this Section, including but not limited to:
- .1 obtaining advance approval of PCB storage sites;
 - .2 notify Departmental Representative prior to beginning operations;
 - .3 report leaks and spills to Departmental Representative;
 - .4 maintain access log of employees working in PCB control area and provide copy to Departmental Representative upon completion of operations.;
 - .5 inspect PCB and PCB-contaminated items and waste containers for leaks and forward copies of inspection reports to Departmental Representative;
 - .6 maintain spill kit for emergency spills entitled "PCB Spill Kit"; and
 - .7 maintain inspection, inventory and spill records.

3.2 ACCESS TO STORAGE
SITE

- .1 Keep entrance to site locked or guarded.
- .2 Maintain register at site containing name, address, telephone number and place of business of each person who enters, or is authorized to enter site.
- .3 Permit only authorized personnel to enter site.

3.3 ACCESS TO STORED
MATERIAL

- .1 Store materials and equipment to permit easy access for inspection.

3.4 STORAGE PRACTICES

- .1 Stack containers only if designed for stacking.
- .2 Stack liquid containers or drums no higher than 2 containers.
- .3 Separate stacked drums from each other with pallets.

3.4 STORAGE PRACTICES
(Cont'd)

- .4 Store material to prevent it catching fire.
- .5 Store material to prevent it being released.
- .6 Store PCB material together, and away from other stored materials.
- .7 Exterior:
 - .1 Cover PCB liquid containers with waterproof roof or cover extending beyond curbing or sides of container.
 - .2 Elevate PCB waste containers and PCB equipment on pallets or other suitable devices to reduce corrosion.
 - .3 Store transformers on skids.
- .8 Interior:
 - .1 Place on skids or pallets PCB equipment and containers of PCB material not permanently secured to floor or surface.

3.5 HANDLING
TRANSFORMERS

- .1 Decontamination of stored waste PCB transformers:
 - .1 Drain dielectric fluid at installation location.
 - .2 Send fluid to approved incinerator for destruction.
 - .3 Drain transformer, switches, and regulators of free flowing liquid prior to transportation. Place drained liquids in DOT certified drums. Drums to contain not more than 190 L of oil.
 - .4 Transport transformer carcass to decontamination facility.
- .2 Re-use of transformers:
 - .1 Dielectric fluid concentration:
 - .1 Mineral oil transformers:
 - .1 Decontaminate by retrofilling, on-line chemical treatment.

3.5 HANDLING
TRANSFORMERS
(Cont'd)

- .2 (Cont'd)
 - .1 (Cont'd)
 - .2 PCB fluid concentration no greater than 50 ppm verified by 90-day test.
 - .2 Askarel transformers:
 - .1 Decontaminate by series retrofilling, in-situ processing.
 - .2 PCB fluid concentration no greater than 50 ppm verified by 90-day test.
 - .3 PCB fluid concentration no greater than 50 ppm verified on an annual basis for three years after completion of decontamination process.
 - .4 Silicone as final dielectric fluid:
 - .1 PCB fluid concentration no greater than 50 ppm verified for ten (10) years at five (5) year intervals.
 - .5 Porous materials:
 - .1 Considered PCB waste unless shown otherwise.
 - .2 Separated and stored, and destroyed by methods approved for PCB waste.
 - .3 Recycling of Transformers:
 - .1 Dielectric fluid concentration:
 - .1 PCB fluid concentration no greater than 5 ppm verified by 90-day test in accordance with The PCB Waste Storage Regulations 21/89.
 - .2 PCB fluid concentration no greater than 50 ppm verified by 90-day test in accordance with the PCB Waste Storage Regulations 21/89.
 - .3 Small pole mount mineral oil transformers:

3.5 HANDLING
TRANSFORMERS
(Cont'd)

- .3 (Cont'd)
 - .1 (Cont'd)
 - .1 drained;
 - .2 PCB fluid concentration no greater than 500 ppm.
 - .2 Surface contamination:
 - .1 Solvent cleaned:
 - .1 10 ug/100 cm².
 - .2 Shredded and incinerated:
 - .1 Less than 0.5 ppm by weight.
 - .2 10 ug/100 cm².
 - .3 Porous materials:
 - .1 Considered PCB waste unless proven otherwise.
- .4 Landfilling of Transformers:
 - .1 PCB fluid concentration no greater than 50 ppm before draining.

3.6 HANDLING LIQUID
CHLOROBIPHENYL (54%
CHLORINE)

- .1 Use impervious clothing (nitrile), gloves, face shields 200 mm minimum and other appropriate protective clothing necessary to prevent skin contact. Do not use natural rubber, neoprene, or polyvinyl chloride (PVC).
- .2 Place contaminated clothing in closed containers for storage. Dispose of contaminated clothing in same manner as PCBs.
- .3 Ensure that contaminated non-pervious clothing is removed promptly and not reworn until cleaned.
- .4 Wear splash-proof safety goggles where liquid chlorobiphenyl (54% chlorine) may contact eyes.

3.7 EMERGENCY
RESPONSES

- .1 General:
 - .1 Immediately report to Departmental Representative and DND Fire Department PCB spills on ground or in water, PCB spills in drip pans, or PCB leaks.
 - .2 Rope off area around edges of PCB leak or spill and post "PCB Spill Authorized Personnel Only" caution sign. Immediately transfer leaking items to drip pan or other container.
 - .3 Initiate cleanup of spills as soon as possible, but no later than 48 hours of its discovery. If misting, elevated temperatures or open flames are present, or if spill is situated in confined space, notify Departmental Representative. Mop up liquid with rags or other conventional absorbent. Properly contained and dispose of spent absorbent as solid PCB waste.
 - .4 Workers to evacuate site. When leaving, shut down water in use. Only personnel trained in use of, and wearing SCUBA apparatus, will be allowed to re-enter site.
 - .5 Do not return to site until Owner's representative and Ministry of the Environment representatives have declared the area safe for re-entry.
- .2 Spill, leak, and disposal procedures:
 - .1 Permit access to only those wearing protective equipment and clothing.
 - .2 Issue poison warnings.
 - .3 Call DND Fire Department or PCB Emergency Response Team.
 - .4 Avoid contact and inhalation.
 - .5 Remove ignition sources.
 - .6 Ventilate areas of spill or leak.
 - .7 Stop or reduce discharge if possible without risk.

3.7 EMERGENCY
RESPONSES
(Cont'd)

- .2 (Cont'd)
 - .8 Collect spilled material for reclamation.
 - .9 Do not flush to sewer.
 - .10 Use only inert sawdust, vermiculite, dry sand, earth, absorbents as approved by Departmental Representative.
 - .11 Wipe contaminated area with rags and kerosine, fuel oil, 1,1,1-trichloroethane chlorothene VG solvent). Do not use acetone or toluene.
 - .12 Notify environmental authorities to determine disposal and clean-up procedures.
- .3 Fire protection and emergency procedures plan for storage sites:
 - .1 Ensure most recent revision of plan is in effect.
 - .2 Develop plan in consultation with DND Fire Department.
 - .3 Ensure employees authorized to enter PCB storage site are familiar with contents of fire protection and emergency procedures plan.
 - .4 Send one copy to DND Fire Department.
 - .5 Display one copy at storage site in area accessible in fire or spill situation.
 - .6 Display one copy at storage site owner's place of business.
- .4 Respirators:
 - .1 Use when chlorobiphenyl concentrations are above permissible exposure levels.
 - .2 Use when entering tanks or closed vessels.
 - .3 Use in emergency situations.
- .5 Permissible exposure limit.

3.7 EMERGENCY
RESPONSES
(Cont'd)

- .5 (Cont'd)
 - .1 0.5 milligram of chlorobiphenyl (54% chlorine) per cubic metre of air, averaged over 8 hours, 1.0 microgram of chlorobiphenyl (54% chlorine) per cubic metre of air up to 10 hours/day.
- .6 Fire protection:
 - .1 Wear totally encapsulated suit and self-contained breathing apparatus with full face piece operated in positive pressure mode.

3.8 SANITATION

- .1 Promptly wash liquid-contaminated skin with soap or mild detergent and water.
- .2 Prohibit eating and smoking in areas where liquid chlorobiphenyl (54% chlorine) is handled, processed or stored.
- .3 Wash hands thoroughly with soap or mild detergent and water after handling liquid chlorobiphenyl (54% chlorine).

3.9 PCB CONTAMINATED
SOILS

- .1 Excavation Procedures:
 - .1 Notify Departmental Representative at least 48 hours prior to start of excavation of contaminated soils.
 - .2 Use methods and equipment that result in minimal disturbance to remaining soil beyond excavation limits.
 - .3 Remove and dispose of material that becomes contaminated as result of Contractor's operation at no additional cost.
 - .4 Stage operations to minimize time contaminated soil is exposed to weather.
 - .5 Provide protection measures around area of contaminated soils to divert runoff of water from within excavation boundaries.
- .2 Underground Utilities:

3.9 PCB CONTAMINATED
SOILS
(Cont'd)

- .2 (Cont'd)
- .1 Location of existing utilities indicated is approximate and other underground utilities may be present. Scan construction site with electromagnetic and sonic equipment and mark surface of ground where existing underground utilities are discovered.
- .2 Physically verify location and elevation of existing utilities indicated prior to beginning procedure. If utilities other than those indicated are found, stop Work and contact Departmental Representative. Protect existing utilities from damage and intrusion of PCBs.
- .3 Dust Control:
- .1 Maintain strict dust control to prevent dust particles with PCBs attached from becoming airborne. Sprinkle or treat soil at site and other areas disturbed by operations with dust suppressants or water.
- .4 Wash Down of Solid Material:
- .1 Remove asphalt pavement, concrete slabs, and structures encountered above or below ground surface within excavation limits.
- .2 Brush to remove soil materials and clean to limit specified for PCB surface contaminated solids by double rinsing, and place in adjacent rubble pile.
- .3 Collect and dispose of wash down water as contaminated water. Sample each type of solid material using either wipe samples or destructive samples at locations as directed by Departmental Representative.
- .4 Analyze samples for PCBs. Collect and test field blanks and replicates. Repeat cleaning process and testing until PCBs are below acceptable limits.
- .5 Remove contaminated soil to horizontal and vertical limits as indicated. Verify limits of clean soils by testing and sampling.
- .6 Handle and dispose of material within this area as PCB contaminated.

3.9 PCB CONTAMINATED
SOILS
(Cont'd)

- .4 (Cont'd)
 - .7 After excavation to indicated limits, conduct analysis of excavation to determine if remaining PCB contaminated soils exist.
 - .8 Collect samples and test by field screening.
 - .9 When field screening results show PCB concentrations below contamination level, test using confirmation sampling and testing. If groundwater is encountered prior to reaching vertical limits, notify Departmental Representative.
- .5 Field Screening:
 - .1 Collect soil samples at same interval as determined for confirmatory grid sampling plan along bottom and along sidewalls of excavation, and test using field screening test.
- .6 Confirmation Sampling and Testing:
 - .1 When field screening results show PCB concentrations below contaminated level, test using confirmation sampling and testing.
 - .2 Sample along bottom and sidewalls of excavation.
 - .3 Compositing of samples for analysis is not allowed.
 - .4 Determine moisture content of sample.
- .7 Additional Excavations:
 - .1 If field screening results indicate PCB contaminated soils remain, notify Departmental Representative.
 - .2 Where directed, continue excavation horizontal and vertical limits as directed by Departmental Representative.
 - .3 Collect and analyze additional confirmation samples in new excavation areas.
- .8 Stockpiled Material:

3.9 PCB CONTAMINATED
SOILS
(Cont'd)

- .8 (Cont'd)
- .1 Place soil removed from excavation in temporary containment area near excavation area.
 - .2 Divert water from containment area.
 - .3 Cover containment area with 0.75 mm polyethylene sheeting.
 - .4 Place excavated soil on impervious barrier and cover with 0.15 mm polyethylene sheeting.
 - .5 Provide straw bale berm around outer limits of containment area and cover with polyethylene sheets.
 - .6 Secure edges of sheets to keep polyethylene sheeting in place.
 - .7 Cover excavated contaminated soil when not being worked. Maintain sheeting and replace when worn or ripped, or soil may be stockpiled in trucks suitable for carrying PCB contaminated soils.
- .9 Composite Testing of Stockpiled Material:
- .1 Take composite samples from stockpiled material prior to removing from site.
 - .2 Analyze minimum of one composite sample for every 100 cubic metres or fraction thereof of soil to be disposed of from site.
 - .3 To develop composite sample of size necessary to run required tests, take several samples from different areas along surface and in centre of the stockpile.
 - .4 Combine these samples and thoroughly mix to develop composite sample.
- .10 Contaminated Water:
- .1 Furnish labour, materials, and equipment necessary for collecting, treating, and discharging of PCB-contaminated surface and subsurface water in excavations at site.

3.9 PCB CONTAMINATED
SOILS
(Cont'd)

- .10 (Cont'd)
- .2 Conduct excavation and backfilling operations at site in manner that minimizes amount of surface and subsurface water which may collect in open excavation.
 - .3 Collect standing surface water in contact with PCB contaminated material.
 - .4 Collect wash water.
 - .5 Collect ground, surface, and rain water contaminated by operations including water collected in open excavation pit or temporary containment.
 - .6 Soak up with absorbent material so that no free liquid is present.
 - .7 Containerize, sample, and analyze PCB absorbed material and dispose of as specified for contaminated soils.
 - .8 Subsurface Drainage:
 - .1 Remove water by pumping or other methods to prevent softening of surfaces exposed by excavation.
 - .2 Provide water treatment necessary to treat water to levels specified.
 - .3 Operate dewatering system continuously until construction work below existing water levels is complete.
 - .4 After placement of initial backfill, water level may be allowed to rise, but never above 300 mm below prevailing level of excavation or backfill.
 - .5 Submit performance records weekly.
 - .6 Measure and record performance of dewatering system at same time each day by use of observation wells or piezometers installed in conjunction with dewatering system.
 - .9 Treatment System Requirements:

3.9 PCB CONTAMINATED
SOILS
(Cont'd)

.10 (Cont'd)

.9 (Cont'd)

.1 Contractor is responsible for all aspects of verifying design parameters designing, providing, installing, operating, maintaining, and removing collection, storage, and treatment facilities as required to discharge treated waters within treatment limits required. Treatment system requirements:

- .1 be capable of removing PCB contaminants to below limit defined for contaminated water;
- .2 include effluent holding tanks designed to allow on-site testing of water quality prior to discharge;
- .3 Include recycle capability for retreatment of effluent not meeting discharge requirements of this specification, as determined by on-site testing.

.10 Treatment System Operations:

- .1 Monitor, test, and adjust the treatment system in compliance with Federal, Provincial and Municipal regulatory requirements.
- .2 If there is conflict between requirements, use more stringent requirement.

.11 Discharge of Treated Water:

- .1 Do not discharge any water until tests results showing water is below PCB contaminated water limits.
- .2 Provide erosion control at outlet of piping to minimize erosion.
- .3 Discharge for treated water to be determined by Departmental Representative.

.12 Cleanup and Removal of Treatment System:

3.9 PCB CONTAMINATED
SOILS
(Cont'd)

- .10 (Cont'd)
- .12 (Cont'd)
- .1 Upon completion of Work, close and remove from site surface water and groundwater treatment system.
- .2 Restore site to its original condition.
- .3 Containerize, sample, test, and dispose of carbon, residues, cleaning aids, decontamination liquids, and waste as specified for contaminated soils.
- .11 Transportation and Disposal:
- .1 Furnish labour, materials, and equipment necessary to store, transport, and dispose of PCB contaminated material in accordance with Federal, Provincial and Municipal requirements.
- .2 Prepare and maintain waste shipment records and manifests as required.
- .3 Transport PCB contaminated soils in vehicles designed to carry PCB contaminated soils in accordance with Federal, Provincial and Municipal requirements.
- .4 Transport PCB contaminated solid material, articles, or equipment in approved containers with removable heads in accordance with TDGA.
- .5 Store liquid PCBs in Specification approved containers in accordance with TDGA.
- .6 In addition to those requirements:
- .1 Inspect and document vehicles and containers for proper operation and covering. Repair or replace damaged containers.
- .2 Inspect vehicles and containers for proper markings, manifest documents, and other requirements for waste shipment.

3.9 PCB CONTAMINATED
SOILS
(Cont'd)

- .11 (Cont'd)
 - .6 (Cont'd)
 - .3 Perform and document decontamination procedures prior to leaving the site and again before leaving disposal site.
 - .7 Weight Certification:
 - .1 Weigh vehicles transporting PCB contaminated materials at provincially certified weigh scale within 24 km of site.
 - .8 Shipping Documentation:
 - .1 Before transporting PCB waste, sign and date manifest.
 - .2 Return signed copy to Departmental Representative.
 - .3 Ensure that manifest accompanies PCB waste at all times.
 - .4 Ensure transporter provides copy of manifest signed and dated by disposal facility.
 - .9 Solvent Cleaning:
 - .1 Clean contaminated tools, and containers, after use by rinsing three times with appropriate solvent or by wiping down three times with solvent wetted rag. Suggested solvents are Stoddard solvent or hexane.
- .12 Reports:
 - .1 Prepare and submit a remediation closeout report at completion of Work.
- .13 Backfilling, Grading, Topsoiling and Seeding:
 - .1 Soils brought in from off site for use as backfill to contain less than one part per million (ppm) PCBs.
 - .2 Provide borrow site testing for PCBs from composite sample of material from borrow site, with at least one test from each borrow site.

3.9 PCB CONTAMINATED SOILS <u>(Cont'd)</u>	.13	(Cont'd)
	.3	Do not bring material on site until tests have been approved by Departmental Representative.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - General Instructions.
- .2 Section 01 35 73 - Confined Spaces Requirements.
- .3 Section 02 81 01 - Hazardous Materials.
- .4 Section 02 82 00.01 - Asbestos Abatement - Type I.
- .5 Section 02 82 00.02 - Asbestos Abatement - Type II.
- .6 Section 02 82 00.03 - Asbestos Abatement - Type III.
- .7 Section 02 83 10 - Lead - Base Paint Abatement Type 1.
- .8 Section 02 83 11 - Lead - Base Paint Abatement Type 2.
- .9 Section 02 83 12 - Lead - Base Paint Abatement Type 3.
- .10 Section 02 84 00 - Polychlorinate Biphenyl Remediation.
- .11 Section 02 85 00.02 - Remediation of Medium Scale Mould Growth.
- .12 Section 02 85 00.03 - Remediation of Large Scale Mould Growth.

1.2 REFERENCES

- .1 American Conference of Governmental Industrial Hygienists (ACGIH), Bioaerosols Assessment and Control 1999.
 - .2 Canadian Construction Association (CCA)
 - .1 CCA 82, Mould Guidelines for the Canadian Construction Industry.
 - .3 Health Canada
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
 - .4 New York City Department of Health - Bureau of Environmental and Occupational Disease Epidemiology's Guidelines on the Assessment and Remediation of Fungi in Indoor Environment 2000
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1.2 REFERENCES
(Cont'd)

- .5 United States Department of Labor Occupational Safety and Health Administration (OSHA)
 - .1 29 CFR 1910.134 - Respiratory Protection.
 - .2 29 CFR 1910.1200 - Hazard Communication.
- .6 United States Environmental Protection Agency (EPA), Mould Remediation in Schools and Commercial Buildings, 2001.

1.3 DEFINITIONS

- .1 Cleaning solution:
 - .1 Detergent solution.
- .2 Competent person:
 - .1 Individuals and Departmental Representative who can demonstrate that mould remediation training has been obtained, is capable of identifying existing microbial hazards in workplace and selecting appropriate control strategy for microbial exposure.
- .3 Contractor:
 - .1 Remediation contractor providing demolition and removal services as defined in specification.
- .4 Fibre reinforced polyethylene sheet (FRPS):
 - .1 Rip-proof fibre reinforced polyethylene sheet sheeting with added fibre reinforced adhesive tape along edges.
- .5 HEPA vacuum:
 - .1 High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining particles greater than 0.3 microns in any direction at 99.97% efficiency.
- .6 HVAC:
 - .1 Heating ventilating and air-conditioning systems which serve occupied areas. Includes but is not limited to air handling units, duct work, terminal boxes and vents.

1.3 DEFINITIONS
(Cont'd)

- .7 Mould contaminated work area:
- .1 Specific area or location where actual work is being performed or such other areas of a facility where it has been determined that it may be hazardous to public health as result of mould remediation.
- .8 Occupied area:
- .1 Areas of building or work site that is outside of mould contaminated work area.
- .9 PPE:
- .1 Personnel Protection Equipment.
- .10 Sprayer:
- .1 Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have a minimum of six (6) litres capacity for work.

1.4 REGULATORY
REQUIREMENTS

- .1 Comply with regulations in effect at time work is performed. In case of conflict among these requirements or with these specifications the more stringent requirement applies. If no regulations exist, follow guidelines most widely accepted by recognized professional organizations such as occupational hygienists, health professionals or environmental engineers as listed in paragraph 1.2 References.

1.5 CLOSEOUT SUBMITTALS

- .1 Maintain general log to provide permanent record of project. Maintain logs and other required documentation as part of permanent project file.

1.6 INSTRUCTION AND
TRAINING

- .1 Before commencing work, provide to Departmental Representative satisfactory proof that every worker has had instruction and training in potential health hazards of mould exposure, handling of hazardous materials, and in use of disposable respirators and protective clothing. This training can be performed as part of program to comply with requirements of OSHA Hazard Communication Standard 29 CFR 1910.1200 or equivalent.

1.6 INSTRUCTION AND
TRAINING
(Cont'd)

- .2 Instruction and training must be provided by designated construction safety advisor.

1.7 WORKER PROTECTION

- .1 Non-powered disposable filter-type respirator of type N95 OSHA 29 CFR 1910.134 or equivalent, suitable for protection against mould and acceptable to Provincial Authority having jurisdiction.
- .2 Gloves and eye protection.
- .3 Disposable paper coveralls are recommended.
- .4 No person required to enter mould contaminated work area to have facial hair that affects seal between respirator and face.
- .5 Eating, drinking and chewing are not permitted in mould contaminated work area.
- .6 Before leaving mould contaminated work area, dispose of protective clothing as waste as specified.
- .7 Ensure workers wash hands and face after leaving mould contaminated work area. Facilities for washing as determined by Departmental Representative.

1.8 REMEDIATION LEVELS

- .1 Mould growth is classified as:
 - .1 small (level I);
 - .2 medium (level II); and
 - .3 large (level III).
- .2 For building finishes and components (e.g. drywall, ceiling tile, carpet, etc.) the levels are as follows:
 - .1 Level I (small scale):
 - .1 areas less than 1 m² (10 ft²).
 - .2 Level II (medium scale):
 - .1 areas between 1-10 m² (10-100 ft²).

1.8 REMEDIATION LEVELS
(Cont'd)

- .2 (Cont'd)
- .3 Level III (large scale):
 - .1 areas greater than 10 m² (>100 ft²).
- .3 When determining the appropriate remediation level, it is important to consider both the total area affected (the perimeter of affected materials) and the density of the mould growth.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Drop sheets:
 - .1 0.15 mm thick woven fibre reinforced fabric bonded both sides with fibre reinforced polyethylene sheet.
- .2 Disposal bags:
 - .1 Dust-tight 0.15 mm clear polyethylene waste bags.
- .3 Wetting agent:
 - .1 Water to mist mould-containing material.
- .4 Cleaning solution:
 - .1 Detergent solution for damp wipe and/or mop.
- .5 Fibre reinforced adhesive tape:
 - .1 Used in sealing joints of fibre reinforced polyethylene sheets and for attachment of fibre reinforced polyethylene sheet to finished and unfinished surfaces. Fibre reinforced adhesive tape must be capable of adhering under both dry and wet conditions.
- .6 Materials:
 - .1 Provide materials such as fibre reinforced polyethylene sheeting, lumber, nails, and hardware necessary to construct and dismantle barriers that isolate mould contaminated work area.

2.2 TOOLS AND
EQUIPMENT

- .1 Tools and equipment:
 - .1 Suitable for use with microbial contamination and must be able to withstand de-contamination.
- .2 Personnel protective equipment:
 - .1 Protective clothing and disposable respirators provided in sufficient quantities for duration of project.
- .3 Vacuum cleaners:
 - .1 Equipped with HEPA filters.
- .4 Ladders and/or scaffolds:
 - .1 Adequate length, strength and sufficient quantity to support work schedule.

PART 3 - EXECUTION

3.1 PREPARATION OF
MOULD WORK AREA (<1
TO 3 M² IN OCCUPIED
SPACE)

- .1 Mould contaminated work area and areas adjacent and around area to be unoccupied. Vacating people from spaces adjacent to mould work area is not necessary but is recommended in case of infants (less than 12 months old), elderly people, persons having undergone recent surgery, immune suppressed people or people with chronic inflammatory lung diseases.
- .2 Clean movable objects within proposed mould contaminated work area using HEPA filtered vacuum equipment, damp wipe surfaces and remove such objects from mould contaminated work area to secure and clean area.
- .3 Remove visible dust from surfaces in mould contaminated work area where dust is likely to be disturbed during course of work. Use HEPA vacuum and damp wipe area.
- .4 Do not use compressed air to clean up or remove dust from surfaces.

3.1 PREPARATION OF
MOULD WORK AREA (<1
TO 3 M² IN OCCUPIED
SPACE)
(Cont'd)

- .5 Seal off return air grills in mould contaminated work area with fibre reinforced polyethylene sheeting and fibre reinforced adhesive tape to minimize migration of contaminants to other parts of building.
- .6 Use 0.15 mm fibre reinforced polyethylene drop sheets tightly sealed with fibre reinforced adhesive tape over flooring in mould contaminated work area.

3.2 PREPARATION OF
MOULD WORK AREA (< 1
M² IN HVAC SYSTEM)

- .1 HVAC systems to be shut down prior to remedial activities.
 - .1 Take necessary precautions to ensure that components of HVAC systems are not contaminated during remediation. Remove and bag filters.
- .2 Barriers:
 - .1 To be erected around mould contaminated work area before remediation using a single layer of 0.15 mm fibre reinforced polyethylene sheeting affixed to floor and ceiling with fibre reinforced adhesive tape, with slit entry and covering flap, to contain dust and debris.
- .3 Use 0.15 mm fibre reinforced polyethylene drop sheets tightly sealed to floor with fibre reinforced adhesive tape to minimize dust and contamination.

3.3 MICROBIAL
REMEDIATION MOULD
WORK AREA (<1 to 3 M² IN
OCCUPIED SPACE)

- .1 Use sprayer (low-velocity, fine-mist) to mist (not wet) materials containing mould to be cut or scraped. Perform work in a manner to reduce dust creation to lowest levels practicable.
- .2 Non-porous and semi-porous materials can be cleaned using detergent solution and reused depending on depth to which microbial growth has penetrated substrate. Wood to be discarded if fungal growth has affected its soundness.
- .3 Porous materials, ceiling tiles, insulation, and wallboards with more than small area of mould contamination and/or dampness to be removed, discarded and replaced.
- .4 Porous materials identified as lightly contaminated that can be cleaned by HEPA vacuuming, washing, or damp wiped can be reused, but to be discarded and replaced if possible.

3.3 MICROBIAL
REMEDATION MOULD
WORK AREA (<1 to 3 M² IN
OCCUPIED SPACE)
(Cont'd)

- .5 Dispose of contaminated building materials as specified.
- .6 During remediation, should Departmental Representative suspect contamination of areas outside mould contaminated work area, contractor to stop remediation work and immediately decontaminate these affected areas. Eliminate causes of such contamination. Unprotected individuals are prohibited from entering contaminated areas until a visual inspection determines areas are free from contamination.
- .7 Notify Departmental Representative of mould contaminated material discovered during work and not apparent from drawings, specifications or report pertaining to work. Do not disturb such material pending instructions from Departmental Representative.

3.4 MICROBIAL
REMEDATION MOULD
WORK AREA (< 1 M² IN
HVAC SYSTEM)

- .1 Use sprayer (low-velocity, fine-mist) to mist (not wet) materials containing mould to be cut or scraped. Perform work in a manner to reduce dust creation to lowest levels practicable.
- .2 Porous materials in HVAC systems such as insulation of interior lined ducts and filters must be removed to bare (underlying) metal and materials properly discarded.
- .3 Dispose of contaminated building materials as specified.
- .4 During remediation, should Departmental Representative suspect contamination of areas outside mould work area, contractor to stop remediation work and immediately decontaminate these affected areas. Eliminate causes of such contamination. Unprotected individuals must be prohibited from entering contaminated areas until visual inspection determines the areas are free from contamination.
- .5 Notify Departmental Representative of mould contaminated material discovered during work and not apparent from drawings, specifications, or report pertaining to work. Do not disturb such material pending instructions from Departmental Representative.
- .6 Submit Material Safety Data Sheet for biocides and use as recommended by HVAC manufacturer with HVAC components.

3.5 REPAIR AND CLEAN-UP

- .1 Clean, frequently during work and immediately after completion of work, mould contaminated work area using a HEPA vacuum and/or by damp mopping with cleaning solution.
- .2 Perform restoration of designated mould contaminated work area as specifies.
- .3 Leave areas dry and visibly free from contamination, debris and dust.
- .4 Perform final thorough clean-up of work areas and adjacent areas affected by work using HEPA vacuum and/or damp mopping with detergent solution.

3.6 WASTE DISPOSAL

- .1 Place dust and mould-containing waste in doubled-bagged dust-tight 0.15 mm clear polyethylene waste bags. Treat drop sheets and disposable protective clothing as waste; fold these items to contain dust, and place in plastic bags. Securely seal bags.
- .2 Clean exterior of each waste-filled bag using damp cloths and cleaning solution or HEPA vacuum prior to removal from mould contaminated work area.
- .3 Remove waste bags from site and dispose. There is no special requirements for disposal of mouldy materials, as such they can be disposed of in landfill.

3.7 RE-ESTABLISHMENT OF
OBJECTS AND SYSTEMS

- .1 Relocate objects moved to temporary locations to their proper positions. Ensure objects are cleaned before been moved into cleaned areas.
- .2 Remount objects removed to former positions.
- .3 Reinstall filters in HVAC systems.
- .4 Re-establish mechanical and electrical systems to proper working order.

- 3.8 FINAL CLEARANCE .1 Departmental Representative to conduct thorough visual inspection to detect visible accumulations of dust or bulk materials remaining in work area. Should dust, debris, microbial contamination, or residue be detected repeat cleaning until area meets approval.

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 01 11 00 - General Instructions.
- .2 Section 01 35 73 - Confined Spaces Requirements.
- .3 Section 02 81 01 - Hazardous Materials.
- .4 Section 02 82 00.01 - Asbestos Abatement - Type I.
- .5 Section 02 82 00.02 - Asbestos Abatement - Type II.
- .6 Section 02 82 00.03 - Asbestos Abatement - Type III.
- .7 Section 02 83 10 - Lead - Base Paint Abatement Type 1.
- .8 Section 02 83 11 - Lead - Base Paint Abatement Type 2.
- .9 Section 02 83 12 - Lead - Base Paint Abatement Type 3.
- .10 Section 02 84 00 - Polychlorinate Biphenyl Remediation.
- .11 Section 02 85 00.01 - Remediation of Small Scale Mould Growth.
- .12 Section 02 85 00.03 - Remediation of Large Scale Mould Growth.

1.2 REFERENCES

- .1 American Conference of Governmental Industrial Hygienists (ACGIH), Bioaerosols Assessment and Control 1999
- .2 Canadian Construction Association (CCA)
 - .1 CCA 82, Mould Guidelines for the Canadian Construction Industry.
- .3 Health Canada
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .4 New York City Department of Health - Bureau of Environmental and Occupational Disease Epidemiology's Guidelines on the Assessment and Remediation of Fungi in Indoor Environment 2000

1.2 REFERENCES
(Cont'd)

- .5 United States Department of Labor Occupational Safety and Health Administration (OSHA)
 - .1 29 CFR 1910.134 - Respiratory Protection.
 - .2 29 CFR 1910.1200 - Hazard Communication.
- .6 United States Environmental Protection Agency (EPA), Mould Remediation in Schools and Commercial Buildings, 2001

1.3 DEFINITIONS

- .1 Authorized visitors:
 - .1 Departmental Representative, Consultants or designated representatives, and representatives of regulatory agencies.
- .2 Cleaning solution:
 - .1 Detergent solution.
- .3 Competent person:
 - .1 Individuals and Departmental Representative who can demonstrate that mould remediation training has been obtained, is capable of identifying existing microbial hazards in workplace and selecting appropriate control strategy for microbial exposure.
- .4 Contractor:
 - .1 Remediation contractor providing demolition and removal services as defined in specification.
- .5 Fibre reinforced polyethylene sheet (FRPS):
 - .1 Rip-proof fibre reinforced polyethylene sheet sheeting with added fibre reinforced adhesive tape along edges.
- .6 HEPA vacuum:
 - .1 High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining particles greater than 0.3 microns in any direction at 99.97% efficiency.

1.3 DEFINITIONS
(Cont'd)

- .7 HVAC:
- .1 Heating ventilating and air-conditioning systems which serve occupied areas. Includes but is not limited to air handling units, duct work, terminal boxes and vents.
- .8 Mould contaminated work area:
- .1 Specific area or location where actual work is being performed or such other areas of a facility where it has been determined that it may be hazardous to public health as result of mould remediation.
- .9 Occupied area:
- .1 Areas of building or work site that is outside of mould contaminated work area.
- .10 PPE:
- .1 Personnel Protection Equipment.
- .11 Sprayer:
- .1 Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have a minimum of six (6) litres capacity for work.

1.4 REGULATORY
REQUIREMENTS

- .1 Comply with regulations in effect at time work is performed. In case of conflict among these requirements or with these specifications the more stringent requirement applies. If no regulations exist, follow guidelines most widely accepted by recognized professional organizations such as occupational hygienists, health professionals or environmental engineers as listed in paragraph 1.2 References.

1.5 SUBMITTALS

- .1 Submit Provincial and/or local requirements for Notice of Project Form.
- .2 Submit proof of Contractors Liability Insurance for dealing with hazardous materials.

1.5 SUBMITTALS
(Cont'd)

- .3 Submit Workers Compensation Board status and transcription of insurance.
- .4 Submit proof of attendance in form of certificate that supervisory personnel have trained in asbestos and/or mould remediation course, approved by Departmental Representative. Minimum of one (1) supervisor for every ten (10) trained workers.

1.6 CLOSEOUT SUBMITTALS

- .1 Maintain general log to provide permanent record of project. Maintain logs and other required documentation as part of permanent project file.
- .2 Daily log must be available for inspection upon request by Departmental Representative.
- .3 Visitor log must be available for inspection upon request by Departmental Representative.

1.7 INSTRUCTION AND
TRAINING

- .1 Before commencing work, provide to Departmental Representative satisfactory proof that every worker has had instruction and training in potential health hazards of mould exposure, handling of hazardous materials, and in use of disposable respirators and protective clothing. This training can be performed as part of program to comply with requirements of OSHA Hazard Communication Standard 29 CFR 1910.1200 or equivalent.
- .2 Instruction and training related to respirators includes at minimum:
 - .1 fitting of equipment;
 - .2 inspection and maintenance of equipment;
 - .3 disinfecting of equipment; and
 - .4 limitations of equipment.
- .3 Instruction and training must be provided by designated construction safety advisor.

1.8 WORKER PROTECTION

- .1 Respirators suitable for protection against mould and acceptable to Provincial Authority having jurisdiction non-powered disposable filter-type respirator of type N95 OSHA 29CFR 1910.134, half-face equipped with replaceable HEPA filter cartridges, full-face air purifying respirators (APR) equipped with replaceable HEPA filter cartridges, personally issued to work and marked as to efficiency and purpose.
- .2 Gloves and eye protection.
- .3 Disposable paper coveralls including head covering.
- .4 Ensure that no person required to enter mould contaminated work area has facial hair that affects seal between respirator and face.
- .5 Eating, drinking and chewing are not permitted in mould contaminated work area.
- .6 Before leaving mould contaminated work area, dispose of protective clothing as waste as specified.
- .7 Ensure workers wash hands and face after leaving mould contaminated work area. Facilities for washing are located as determined by Departmental Representative.

1.9 VISITOR PROTECTION

- .1 Protective clothing and approved respirators non-powered disposable filter-type respirator of type N95 OSHA 29CFR 1910.134, full face or ½ face with eye protection to be worn by authorized visitors to mould contaminated work area.
- .2 Instruct authorized visitors in use of protective clothing, respirators, and procedures.
- .3 Instruct authorized visitors in proper procedures to be followed in entering into and exiting from mould contaminated work area.

1.10 REMEDIATION LEVELS

- .1 Mould growth is classified as:
 - .1 small (level I);
 - .2 medium (level II); and
 - .3 large (level III).

1.10 REMEDIATION LEVELS
(Cont'd)

- .2 For building finishes and components (e.g. drywall, ceiling tile, carpet, etc.) the levels are as follows:
 - .1 Level I (small scale):
 - .1 areas less than 1 m² (10 ft²).
 - .2 Level II (medium scale):
 - .1 areas between 1-10 m² (10-100 ft²).
 - .3 Level III (large scale):
 - .1 areas greater than 10 m² (>100 ft²).
- .3 When determining the appropriate remediation level, it is important to consider both the total area affected (the perimeter of affected materials) and the density of the mould growth.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Drop sheets:
 - .1 Fibre reinforced polyethylene 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Disposal bags:
 - .1 Dust-tight 0.15 mm clear polyethylene waste bags.
- .3 Wetting agent:
 - .1 Water to mist mould-containing material.
- .4 Cleaning solution:
 - .1 Detergent solution for damp wipe and/or mop.
- .5 Fibre reinforced adhesive tape:

2.1 MATERIALS
(Cont'd)

- .5 (Cont'd)
 - .1 Used in sealing joints of fibre reinforced polyethylene sheets and for attachment of fibre reinforced polyethylene sheet to finished and unfinished surfaces. Fibre reinforced adhesive tape must be capable of adhering under both dry and wet conditions.
- .6 Materials:
 - .1 Provide materials such as fibre reinforced polyethylene sheeting, lumber, nails, and hardware necessary to construct and dismantle barriers that isolate mould contaminated work area.

2.2 TOOLS AND
EQUIPMENT

- .1 Tools and equipment:
 - .1 Suitable for use with microbial contamination and must be able to withstand de-contamination.
- .2 Personnel protective equipment:
 - .1 Protective clothing, personal respiratory filter cartridges, HEPA air filters, etc. to be provided in sufficient quantities for duration of project.
- .3 Vacuum cleaners:
 - .1 Equipped with HEPA filters.
- .4 Ladders and/or scaffolds:
 - .1 Adequate length, strength and sufficient quantity to support work schedule.
- .5 Exhaust air fan systems:
 - .1 Equipped with HEPA filters and be capable of providing sufficient exhaust air to create a minimum pressure differential of 5 to 7 Pa and to allow sufficient flow of air through area.

PART 3 - EXECUTION

3.1 PREPARATION OF MOULD CONTAMINATED WORK AREA

- .1 Mould contaminated work area and areas adjacent and around area to be unoccupied. Vacating is recommended in case of infants (less than 12 months old), elderly people, persons having undergone recent surgery, immune suppressed people or people with chronic inflammatory lung diseases.
- .2 One (1) supervisor for every ten (10) trained workers is required.
- .3 Approved supervisor must remain within mould contaminated work area at all times during disturbance, removal or other handling of mould-contaminated materials.
- .4 Turn off HVAC systems prior to starting remediation work to prevent contamination and dust dispersal to other areas of building.
- .5 Seal off windows, doorways, skylights, ducts, grilles, diffusers and other openings between mould contaminated work area and uncontaminated areas outside mould contaminated work area with fibre reinforced polyethylene sheeting and fibre reinforced adhesive tape to minimize migration of contaminants to other parts of building.
- .6 Clean movable objects within proposed mould contaminated work area using HEPA filtered vacuum equipment, damp wipe surfaces and remove such objects from mould contaminated work area to a secure and clean area.
- .7 Clean fixed objects within proposed mould contaminated work area using HEPA filtered vacuum, damp wipe surfaces and cover with one layer of fibre reinforced polyethylene sheeting securely fastened with fibre reinforced adhesive tape.
- .8 Remove visible dust from surfaces in mould contaminated work area where dust is likely to be disturbed during course of mould remediation work. Use HEPA vacuum and damp wipe the area.
- .9 Do not use compressed air to clean up or remove dust from any surface.

3.1 PREPARATION OF
MOULD CONTAMINATED
WORK AREA
(Cont'd)

- .10 Erect critical barriers around perimeter of mould contaminated work area before remediation using single layer of 0.15 mm fibre reinforced polyethylene sheeting extending from floor slab to as close as possible to underside of above floor slab. Seal gaps due to ductwork, piping conduits with layer of 0.15 mm fibre reinforced polyethylene sheeting. For larger areas, a steel or wooden stud frame can be erected and fibre reinforced polyethylene sheeting attached to it.
- .11 Use 0.15 mm fibre reinforced drop sheets tightly sealed with fibre reinforced adhesive tape over flooring in work areas.
- .12 Ensure that containment area is under negative pressure. Use HEPA filtered fan exhausted outside of mould contaminated work area to create negative pressure.
- .13 In smaller easily contained areas, use HEPA vacuum cleaner nozzle within enclosure. Locate vacuum canister outside enclosure.
- .14 Before beginning work, at each access to contaminated work area, install warning signs in both official languages in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used : 'CAUTION MOULD HAZARD AREA (25 mm) / NO UNAUTHORIZED ENTRY (19 mm) / WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) / BREATHING MOULD DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.
- .15 Do not begin remediation work until barriers are inspected and authorization is given by Departmental Representative.

3.2 MICROBIAL
REMEDICATION

- .1 If remediation procedures are expected to generate dust or visible concentration of fungi is heavy (blanket as opposed to patchy coverage), then it is recommended that maximum precautions Section 02 85 00.03 for Mould Remediation be followed using full containment.
- .2 Use sprayer (low-velocity, fine-mist) to mist (not wet) materials containing mould to be cut or scraped. Perform work to reduce dust creation to lowest levels practicable.
- .3 Non-porous and semi-porous materials can be cleaned using the cleaning solution and reused depending on depth to which microbial growth has penetrated substrate. Wood to be discarded if fungal growth has affected its soundness.

3.2 MICROBIAL
REMEDiation
(Cont'd)

- .4 Porous materials, ceiling tiles, insulation, and wallboards with more than 1 m² of mould contamination and/or dampness to be removed, discarded and replaced.
- .5 Porous materials identified as lightly contaminated that can be cleaned by HEPA vacuuming, washing, or damp wiping can be reused, but to be discarded and replaced if possible.
- .6 Dispose of contaminated building materials as specified.
- .7 During mould remediation, should Departmental Representative suspect contamination of areas outside enclosed mould contaminated work area, contractor to stop remediation work and immediately decontaminate affected areas. Eliminate causes of such contamination. Prohibit unprotected individuals from entering these contaminated areas until air and swab sampling and a visual inspection determines areas are free from contamination.
- .8 Notify Departmental Representative of mould contaminated material discovered during work and not apparent from drawings, specifications or report pertaining to work. Do not disturb such material pending instructions from Departmental Representative.

3.3 REPAIR AND CLEAN-UP

- .1 During mould remediation and immediately after completion of mould remediation, clean enclosure starting within top of enclosure and working down to floor. Clean areas using HEPA vacuum and/or by damp mopping with cleaning solution.
- .2 Perform restoration of designated mould contaminated work area as specified.
- .3 Leave areas dry and visibly free from contamination, debris and dust.
- .4 After clean-up within barrier dismantle, barrier and dispose of as specified.
- .5 Perform final thorough clean-up of work areas and adjacent areas affected by work using HEPA vacuum and/or damp mopping with cleaning solution.

3.4 WASTE DISPOSAL

- .1 Place debris and mould-containing waste in doubled-bagged dust-tight 0.15 mm fibre reinforced clear polyethylene waste bags. Treat drop sheets and disposable protective clothing as waste; fold these items to contain dust, and place in plastic bags. Securely seal bags.
- .2 Cover large items that have heavy mould growth with fibre reinforced polyethylene sheeting and sealed with fibre reinforced adhesive tape before they are removed from enclosure.
- .3 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum prior to removal from mould contaminated work area.
- .4 Remove waste bags from site and dispose. There is no special requirements for disposal of mouldy materials, as such they can be disposed of in landfill.

3.5 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

- .1 Return objects moved to temporary locations to their location. Ensure objects are cleaned before been moved into cleaned areas.
- .2 Remount objects removed to former positions.
- .3 Re-establish mechanical and electrical systems to proper working order. Install new filters into HVAC systems serving the affected area as part of remediation.

3.6 FINAL CLEARANCE

- .1 Departmental Representative to conduct thorough visual inspection to detect visible accumulations of dust or bulk materials remaining in work area. Should dust, debris, microbial contamination, or residue be detected repeat cleaning, until area meets approval.
- .2 Before and after work, take air samples inside of mould contaminated work area enclosures in accordance with recommended guidelines.
- .3 Perform final air monitoring of mould contaminated work area provided area has passed visual inspection and an appropriate settling period of 12 hours has passed. If air monitoring results are deemed unacceptable by Departmental Representative areas are to be re-cleaned with HEPA vacuum and damp wiped until levels are found to be acceptable by Departmental Representative.

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 01 11 00 - General Instructions.
- .2 Section 01 35 73 - Confined Spaces Requirements.
- .3 Section 02 81 01 - Hazardous Materials.
- .4 Section 02 82 00.01 - Asbestos Abatement - Type I.
- .5 Section 02 82 00.02 - Asbestos Abatement - Type II.
- .6 Section 02 82 00.03 - Asbestos Abatement - Type III.
- .7 Section 02 83 10 - Lead - Base Paint Abatement Type 1.
- .8 Section 02 83 11 - Lead - Base Paint Abatement Type 2.
- .9 Section 02 83 12 - Lead - Base Paint Abatement Type 3.
- .10 Section 02 84 00 - Polychlorinate Biphenyl Remediation.
- .11 Section 02 85 00.01 - Remediation of Small Scale Mould Growth.
- .12 Section 02 85 00.02 - Remediation of Medium Scale Mould Growth.

1.2 REFERENCES

- .1 American Conference of Governmental Industrial Hygienists (ACGIH), Bioaerosols Assessment and Control 1999
- .2 Canadian Construction Association (CCA)
 - .1 CCA 82, Mould Guidelines for the Canadian Construction Industry.
- .3 Health Canada
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .4 New York City Department of Health - Bureau of Environmental and Occupational Disease Epidemiology's Guidelines on the Assessment and Remediation of Fungi in Indoor Environment 2000

1.2 REFERENCES
(Cont'd)

- .5 United States Department of Labor Occupational Safety and Health Administration (OSHA)
 - .1 29 CFR 1910.134 - Respiratory Protection.
 - .2 29 CFR 1910.1200 - Hazard Communication.
- .6 United States Environmental Protection Agency (EPA), Mould Remediation in Schools and Commercial Buildings, 2001

1.3 DEFINITIONS

- .1 Authorized visitors:
 - .1 Departmental Representative, Consultants or designated representatives, and representatives of regulatory agencies.
- .2 Cleaning solution:
 - .1 Detergent solution.
- .3 Competent person:
 - .1 Individuals and Departmental Representative who can demonstrate that mould remediation training has been obtained, is capable of identifying existing microbial hazards in workplace and selecting appropriate control strategy for microbial exposure.
- .4 Contractor:
 - .1 Remediation contractor providing demolition and removal services as defined in specification.
- .5 Critical barrier or enclosure:
 - .1 Minimum of two separate layers of 0.15 mm fibre reinforced polyethylene sheeting (FRPS) tarp taped securely and separately over windows, doorways, diffusers, grilles and any other openings between work area and uncontaminated areas outside of work area including outside of building.
- .6 Curtained doorway:

1.3 DEFINITIONS
(Cont'd)

- .6 (Cont'd)
- .1 Arrangement of closures to allow ingress and egress from one room to another. Typically constructed as follows: Place two overlapping sheets (minimum overlap of 1 metre or width of doorway) of FRPS, tarp over existing or temporarily framed doorway, securing each along top of doorway, securing vertical edge of one sheet along one vertical side of doorway and securing vertical edge of other sheet along opposite vertical side of doorway. Reinforce free edges of FRPS, tarp with fibre reinforced adhesive tape and weight bottom edge to ensure proper closing. Space curtained doorways minimum of 2 metres apart.
- .7 Decontamination room:
- .1 Enclosure located between mould contaminated work area and uncontaminated area for decontamination of equipment and workers, typically consisting of two curtained doorways at least 2 metres apart.
- .8 Fibre reinforced polyethylene sheet (FRPS):
- .1 Rip-proof fibre reinforced polyethylene sheet sheeting with added fibre reinforced adhesive tape along edges.
- .9 HEPA vacuum:
- .1 High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining particles greater than 0.3 microns in any direction at 99.97% efficiency.
- .10 HVAC:
- .1 Heating ventilating and air-conditioning systems which serve occupied areas. Includes but is not limited to air handling units, duct work, terminal boxes and grills.
- .11 Mould contaminated work area:
- .1 Specific area or location where actual work is being performed or such other areas of a facility where it has been determined that it may be hazardous to public health as result of mould remediation.

1.3 DEFINITIONS
(Cont'd)

.12 Negative pressure:

- .1 Maintain mould contaminated work area at negative pressure relative to surrounding space to prevent contaminants from leaving contaminated area. Use exhaust fan with HEPA filter to maintain mould contaminated work area at lower pressure than surrounding areas. Maintain pressure differential of 5 to 7 Pa . Air flow movement can be verified with smoke pencil.

.13 Occupied area:

- .1 Areas of building or work site that is outside of mould contaminated work area.

.14 PPE:

- .1 Personnel Protection Equipment.

.15 Sprayer:

- .1 Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have a minimum of six litres capacity for work.

1.4 REGULATORY
REQUIREMENTS

- .1 Comply with regulations in effect at time work is performed. In case of conflict among these requirements or with these specifications more stringent requirement applies. If no regulations exist, follow guidelines most widely accepted by recognized professional organizations such as occupational hygienists, health professionals or environmental engineers as listed in paragraph 1.2 References.

1.5 SUBMITTALS

- .1 Submit proof satisfactory to Departmental Representative that employees have had instruction on potential hazards of mould exposure, use of personal respirator and protective clothing, entry and exit from work areas and aspects of work procedures and protective measures.
- .2 Submit proof of attendance in form of certificate that supervisory personnel have been trained in asbestos and/or mould remediation course, approved by Departmental Representative. Minimum of one (1) supervisor for every ten (10) trained workers.

1.5 SUBMITTALS
(Cont'd)

- .3 Submit proof of qualifications of both remediation supervisor and subcontractors including relevant job experience to project.
- .4 Submit layout of proposed enclosures and decontamination facilities to Departmental Representative for review.
- .5 Submit Provincial and/or local requirements for Notice of Project Form.
- .6 Submit proof of Contractors Liability Insurance for dealing with hazardous materials.
- .7 Submit fitting record by construction safety advisor to Departmental Representative that employees have prior respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.
- .8 Submit Workers Compensation Board status and transcription of insurance.

1.6 CLOSEOUT SUBMITTALS

- .1 Maintain general log provide to permanent record of project. Maintain logs, including negative pressure records and other required documentation as part of permanent project file.
- .2 Daily log must be available for inspection upon request by Departmental Representative.
- .3 Visitor log must be available for inspection upon request by Departmental Representative.

1.7 INSTRUCTION AND TRAINING

- .1 Before commencing work, provide Departmental Representative proof that workers have had instruction and training in potential health hazards of mould exposure, handling of hazardous materials, in personal hygiene including protective clothing, entry and exit from mould contaminated work area, use of disposal procedures including building materials, respirators and protective clothing.
- .2 Instruction and training related to use of personal respirators:
 - .1 fitting of equipment;
 - .2 inspection and maintenance of equipment;

1.7 INSTRUCTION AND
TRAINING
(Cont'd)

- .2 (Cont'd)
- .3 disinfecting of equipment; and
- .4 limitations of equipment.
- .3 Instruction and training must be provided by designated construction safety advisor.
- .4 Supervisory personnel to complete required training in asbestos abatement and/or mould remediation.

1.8 WORKER PROTECTION

- .1 Provide tight-fitting full-face dual cartridge negative air purifying respirator equipped with HEPA filter cartridges to be worn. Disposable respirators not allowed.
- .2 Gloves that extend to middle of forearm.
- .3 Use mould-impervious polyethylene coated disposable head and foot coverings, and body suit made of breathable material. Seal gaps, such as those around ankles and wrists, with fibre reinforced adhesive tape.
- .4 Procedures for entering mould contaminated work area. Each worker to:
 - .1 Remove street clothes in decontamination room and put on respirator with new filters or reusable filters, clean disposable protective clothing and head covers before entering mould contaminated work area. Store street clothes, uncontaminated footwear and towels in decontamination room.
 - .2 Ensure that no person required to enter mould contaminated work area has facial hair that affects seal between respirator and face.
 - .3 Eating, drinking and chewing are not permitted in mould contaminated work area. Drinking is permitted in decontamination area.
- .5 Procedures for exiting mould contaminated work area. Workers to:

1.8 WORKER PROTECTION
(Cont'd)

- .5 (Cont'd)
- .1 Remove gross contamination from clothing before leaving work area then proceed to decontamination room and remove disposable protective clothing except respirators. Place contaminated worksuits in closed containers for disposal with mould contaminated materials.
 - .2 Clean outside of respirator with cleaning solution. Remove respirator, remove and dispose of filters in container provided for purpose. Wash and rinse inside of respirator.
 - .3 When not in use in work area, store reusable work footwear in decontamination room. Upon completion of mould remediation, clean footwear thoroughly inside and out using cleaning solution before removing from mould contaminated work area or from decontamination room.
 - .4 Proceed to decontamination room and change into street clothes at end of each day's work.
 - .5 If re-entering work area, follow entering and exiting procedures.
 - .6 Workers to be fully protected with respirators and protective equipment clothing during preparation of erecting enclosure prior to commencing actual mould remediation.
 - .7 Post in decontamination room procedures specified, in both official languages.

1.9 VISITOR PROTECTION

- .1 Protective clothing and approved respirators full face or 1/2 face with eye protection to be worn by authorized visitors to mould contaminated work area.
- .2 Instruct authorized visitors in proper use of protective clothing, respirators, and procedures.
- .3 Instruct authorized visitors proper procedures to be followed in entering into and exiting from mould contaminated work area.

1.10 REMEDIATION LEVELS

- .1 Mould growth is classified as:
 - .1 small (level I);

1.10 REMEDIATION LEVELS
(Cont'd)

- .1 (Cont'd)
- .2 medium (level II); and
- .3 large (level III).
- .2 For building finishes and components (e.g. drywall, ceiling tile, carpet, etc.) the levels are as follows:
 - .1 Level I (small scale):
 - .1 areas less than 1 m² (10 ft²).
 - .2 Level II (medium scale):
 - .1 areas between 1-10 m² (10-100 ft²).
 - .3 Level III (large scale):
 - .1 areas greater than 10 m² (>100 ft²).
- .3 When determining the appropriate remediation level, it is important to consider both the total area affected (the perimeter of affected materials) and the density of the mould growth.

1.11 SITE CONDITIONS

- .1 Inform sub-trades of presence of mould-contaminated materials and potential health hazards of mould exposure.
- .2 Submit to Departmental Representative copy of notifications prior to start of work.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Drop sheets:
 - .1 Fibre reinforced polyethylene 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Disposal bags:
 - .1 Dust-tight 0.15 mm clear polyethylene waste bags.
- .3 Wetting agent:

2.1 MATERIALS
(Cont'd)

- .3 (Cont'd)
 - .1 Water to mist mould-containing material.
- .4 Cleaning solution:
 - .1 Detergent solution for damp wipe and/or mop.
- .5 Fibre reinforced adhesive tape:
 - .1 Used in sealing joints of fibre reinforced polyethylene sheets and for attachment of fibre reinforced polyethylene sheet to finished and unfinished surfaces. Fibre reinforced adhesive tape must be capable of adhering under both dry and wet conditions.
- .6 Materials:
 - .1 Provide materials such as polyethylene sheeting, lumber, nails and other hardware necessary to construct and dismantle decontamination enclosures and barriers that isolate mould work area as appropriate for work.

2.2 TOOLS AND
EQUIPMENT

- .1 Tools and equipment:
 - .1 Suitable for use with microbial contamination and must be able to withstand de-contamination.
- .2 Personnel protective equipment:
 - .1 Protective clothing, personal respiratory filter cartridges, HEPA air filters, etc. to be provided in sufficient quantities for duration of project.
- .3 Exhaust air fan systems:
 - .1 Equipped with HEPA filters and be capable of providing sufficient exhaust air to create a minimum pressure differential of 5 to 7 Pa and to allow sufficient flow of air through area.
- .4 Pressure differential automatic recording instrument provide:

2.2 TOOLS AND
EQUIPMENT
(Cont'd)

- .4 (Cont'd)
- .1 To ensure exhaust air devices provide minimum pressure differential required between mould contaminated work area and uncontaminated areas. Install equipment in critical barrier between mould contaminated work area and uncontaminated areas and gap seal with fibre reinforced adhesive tape.
- .5 Vacuum cleaners:
- .1 Equipped with HEPA filters.
- .6 Ladders and/or scaffolds:
- .1 Adequate length, strength and sufficient quantity to support work schedule.

PART 3 - EXECUTION

3.1 PREPARATION OF
MOULD CONTAMINATED
WORK AREAS (GREATER
THAN 10 M²
CONTAMINATED IN AN
AREA)

- .1 Mould Contaminated Work Area and areas adjacent and around: unoccupied. Vacating is required for infants (less than 12 months old), elderly people, persons having undergone recent surgery, immune suppressed people or people with chronic inflammatory lung diseases.
- .2 One (1) supervisor for every ten (10) trained mould remediation workers is required.
- .3 Approved supervisor must remain within mould contaminated work area during disturbance, removal, or other handling of mould-contaminated materials.
- .4 Turn off HVAC systems serving mould contaminated work areas prior to starting remediation work to prevent contamination and dust dispersal to other areas of building.
- .5 Clean movable objects within proposed mould contaminated work area using HEPA filtered vacuum, damp wipe surfaces and remove such objects from mould contaminated work area to a secure and clean area.

3.1 PREPARATION OF
MOULD CONTAMINATED
WORK AREAS (GREATER
THAN 10 M²
CONTAMINATED IN AN
AREA)
(Cont'd)

- .6 Clean fixed objects within proposed work area using HEPA filtered vacuum, damp wipe surfaces and enclose with two (2) separate layers of 0.15 mm fibre reinforced polyethylene sheeting securely sealed with fibre reinforced adhesive tape.
- .7 Remove visible dust from surfaces in work area where dust is likely to be disturbed during course of mould remediation work. Use HEPA vacuum and damp wipe area.
- .8 Do not use compressed air to clean up or remove dust from surfaces.
- .9 Seal off windows, doorways, skylights, ducts, grilles, diffusers, ceiling plenums, electrical outlets and openings between work area and uncontaminated areas to prevent spread of dirt and spores with two (2) separate layers of 0.15 mm (fibre reinforced polyethylene sheeting securely held in place by fibre reinforced adhesive tape. Doorways and corridors that will not be used for passage during work must be sealed with fixed critical barriers.
- .10 Erect critical barriers around perimeter of mould contaminated work area before remediation using two separate layers of 0.15 mm fibre reinforced polyethylene sheeting extending from floor slab to as close as possible to underside of above floor slab. Seal gaps due to ductwork, piping conduits with two (2) separate layers of 0.15 mm fibre reinforced polyethylene sheeting. For larger areas, erect steel or wooden stud frame and fibre reinforced polyethylene sheeting attached to it. Frame openings greater than 3 square metres with 38 x 89 mm studs spaced 400 mm on center. Barriers must be constructed without disturbing contaminated materials.
- .11 Seal floor and wall surfaces within enclosure which are not to be removed as microbial waste with minimum of two (2) separate layers of 0.15 mm polyethylene sheeting. Cover floors first so that fibre reinforced polyethylene extends at least 300 mm and fold up against enclosure wall, overlap vertical fibre reinforced polyethylene sheet with floor fold up.
- .12 Build worker decontamination room at exits from work areas.

3.1 PREPARATION OF
MOULD CONTAMINATED
WORK AREAS (GREATER
THAN 10 M²
CONTAMINATED IN AN
AREA)

(Cont'd)

- .13 Put negative pressure system in operation and operate continuously from time first fibre reinforced polyethylene is installed to seal openings until final completion of work including final clean-up. Provide continuous monitoring of pressure differential using automatic recording instrument.
- .14 After mould contaminated work area enclosure is completed, remove HVAC filters, pack in sealed plastic bags 0.15 mm minimum thickness and treat as contaminated waste. Remove objects that might interfere with mould removal, as directed by Departmental Representative. Use HEPA vacuum during fixture removal to reduce dust dispersal.
- .15 Before beginning mould remediation work, at each access to mould contaminated work area, install warning signs in both official languages in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used : 'CAUTION MOULD HAZARD AREA (25 mm) / NO UNAUTHORIZED ENTRY (19 mm) / WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) / BREATHING MOULD DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.

3.2 PREPARATION OF
WORKER
DECONTAMINATION
ENCLOSURE SYSTEM

- .1 Establish worker decontamination enclosure system between mould contaminated work area and uncontaminated area. Access to mould contaminated work area through this enclosure.
- .2 Access to decontamination room through double flap curtained openings.
- .3 Decontamination room:
 - .1 Build decontamination room between mould contaminated work area, with two curtained doorways, one to mould contaminated work area and one to uncontaminated area. Install waste receptor and storage facilities for workers' shoes and protective clothing to be reworn in decontamination room. Decontamination room: large enough to accommodate specified facilities, equipment needed, and at least one worker allowing sufficient space to change clothes comfortably. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.

3.2 PREPARATION OF WORKER DECONTAMINATION ENCLOSURE SYSTEM (Cont'd)	.4	No personnel permitted to leave decontamination room unless first decontaminated by changing, wet cleaning or HEPA vacuuming to remove dust and mould spores. No contaminated materials or persons to enter uncontaminated area.
3.3 MAINTENANCE OF ENCLOSURES	.1	Maintain enclosures in tidy condition.
	.2	Ensure that barriers and fibre reinforced polyethylene linings are effectively sealed with duct tape at beginning of each working period. Repair damaged barriers and remedy defects immediately upon discovery.
	.3	Use smoke methods to test effectiveness of barriers when directed by Engineer.
3.4 PREPARATION OF HVAC SYSTEM ENCLOSURES (> 1 M ² CONTAMINATION)	.1	Preparation of enclosures as specified can be applied to 3 m ² remediation of microbial growth on outside or inside surfaces of HVAC systems.
	.2	Shut down HVAC systems prior to mould remedial activities.
	.3	Take necessary precautions to ensure that components of HVAC systems are not contaminated during remediation, especially porous materials such as filters.
	.4	Decontamination rooms are required if contamination is greater than 3 m ² .
3.5 MICROBIAL REMEDIATION WORK AREA	.1	Commence mould remediation work when: .1 Mould contaminated work area and decontamination enclosure are effectively segregated from parts of building required to remain in use. Enclosures are to be inspected by the Departmental Representative. .2 Tools, equipment and materials waste containers are on site. .3 Building security has been set up.

3.5 MICROBIAL
REMEDATION WORK
AREA
(Cont'd)

- .1 (Cont'd)
- .4 Warning signs as specified are displayed where access to contaminated areas is possible.
- .5 Notifications have been completed and preparatory steps have been taken.
- .2 Authorized supervisor employed by contractor and qualified in microbial contamination remediation to be on job site to ensure establishment and maintenance of negative pressure enclosure and proper work practices throughout project.
- .3 Do not begin remediation work until authorized by Departmental Representative.
- .4 Use sprayer (low-velocity, fine-mist) to mist (not wet) materials containing mould to be cut or scraped. Perform work to reduce dust creation to lowest levels practicable.
- .5 Remove microbially contaminated materials, wallpaper, ceiling tiles, insulation from framing, carpet, and wallboard in designated locations as outlined in specification. Removal to include visibly contaminated material as determined by Departmental Representative.
- .6 Remove contaminated material in small sections within enclosure. Pack material in sealable plastic bags 0.15 mm minimum thickness and place in containers for disposal.
- .7 Non-porous and semi-porous materials that are identified as contaminated can be cleaned using HEPA-filtered vacuuming and damp wiping with detergent solution and reused depending on depth to which microbial growth has penetrated substrate. Wood is to be discarded if fungal growth has affected its soundness.
- .8 Where designed waste container is not used, remove sealed containers containing mould waste and dispose following specified procedures.

3.5 MICROBIAL
REMEDATION WORK
AREA
(Cont'd)

- .9 During mould remediation, should the Departmental Representative suspect contamination of areas outside enclosed mould contaminated work area contractor to stop remediation work and immediately decontaminate these affected areas. Eliminate causes of such contamination. Unprotected individuals prohibited from entering these contaminated areas until air and swab sampling and visual inspections determine areas are free of contamination.

3.6 MICROBIAL
REMEDATION HVAC
WORK AREA

- .1 Porous materials in HVAC systems such as insulation of interior lined ducts, fibrous insulation and filters must be removed to bare (underlying) metal and materials properly discarded as specified
- .2 Submit Material Safety Data Sheet for biocides to be used as recommended by HVAC manufacturer with HVAC components.
- .3 During mould remediation, should Departmental Representative suspect contamination of areas outside enclosed mould contaminated work area, contractor to stop remediation work and immediately decontaminate affected areas. Eliminate causes of such contamination. Prohibit unprotected individuals from entering these contaminated areas until air and swab sampling and a visual inspection determines areas are free from contamination.

3.7 REPAIR AND CLEAN-UP

- .1 During mould remediation and immediately after completion of mould remediation, clean enclosure starting within top of enclosure and working down to floors. Clean both enclosed area and decontamination room using HEPA vacuum and/or by damp mopping with cleaning solution.
- .2 HEPA vacuum inside layer of polyethylene sheeting within work area and damp wiped prior to removal. Removal of this layer to occur after removal and decontamination activities are completed and work area inspected by Departmental Representative.
- .3 Perform restoration of designated mould contaminated work as specified.
- .4 Remove inside layer of fibre reinforced polyethylene sheeting by rolling it away from walls to centre of work area. Vacuum visible debris during cleanup, immediately, using HEPA vacuum.

3.7 REPAIR AND CLEAN-UP (Cont'd)

- .5 HEPA vacuum, minimum of twelve hours after inside layer of fibre reinforced polyethylene sheeting has been removed, second layer of polyethylene sheeting and damp wipe.
- .6 Include decontamination room in similar clean-up.
- .7 Remove non-essential fibre reinforced polyethylene sheetings and visible accumulations of material and debris.
- .8 Dispose of used fibre reinforced polyethylene sheets, used fibre reinforced adhesive tape, cleaning material, clothing, and contaminated waste.
- .9 Include sealed waste containers and equipment used in mould contaminated work area in cleanup and removed from work area, via decontamination room.
- .10 Carry out final visual inspection check to ensure that no dust or debris remains on surfaces as result of dismantling operations. Perform final clearance air sampling acceptable by Departmental Representative prior to re-occupancy. Repeat cleaning using HEPA vacuum equipment, or damp cleaning methods, in conjunction with sampling until levels meet these criteria.
- .11 Upon notification that final tests are acceptable remove remaining critical barriers. HEPA vacuum surfaces behind containment barriers, including walls, floors, ceiling tiles, windows, doors and other surfaces. HEPA vacuum adjacent interior spaces within 3 metres of former location of containment barriers.

3.8 WASTE DISPOSAL

- .1 Place debris and microbial infected waste in doubled-bagged dust-tight 0.15 mm clear polyethylene waste bags. Treat drop sheets and disposable protective clothing as waste; fold these items to contain dust, and place in plastic bags. Securely seal bags and place in waste containers for transport.
- .2 Cover large items that have heavy mould growth with two (2) layers of polyethylene sheeting and sealed with fibre reinforced adhesive tape before they are removed from cleaned work area.
- .3 Clean outside of bags and/or waste containers with damp cloth and cleaning solution or HEPA vacuumed prior to their transport to uncontaminated areas of building.

3.8 WASTE DISPOSAL <u>(Cont'd)</u>	.4	Remove waste bags and/or containers from site and dispose. There are no special requirement for disposal of mouldy materials, as such they can be disposed of in landfill.
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3.9 RE-ESTABLISHMENT OF MOVABLE OBJECTS AND <u>SYSTEMS</u>	.1	Return objects moved to temporary locations to their original location. Ensure objects are cleaned before been moved into cleaned area.
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	.2	Remount objects to former positions.
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	.3	Advise Building Operator to re-establish HVAC and electrical systems to proper working condition. Replace filters in HVAC system serving affected area.
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3.10 AIR MONITORING AND <u>FINAL CLEARANCE</u>	.1	Before and after work, take air samples inside of mould contaminated work area enclosure in accordance with recommended guidelines.
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	.2	Departmental Representative to conduct thorough visual inspection to detect visible accumulations of dust or bulk materials remaining in work area. If dust, debris, microbial contamination, or residue be detected repeat cleaning at until area meets approval.
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	.3	Perform final air monitoring of mould contaminated work area provided area has passed visual inspection and appropriate settling period of 12 hours has passed. If air monitoring results are deemed unacceptable by Departmental Representative, re-cleaned areas with HEPA vacuum and damp wiped until levels are found to be acceptable by Departmental Representative.
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