

PART 1 GENERAL

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| <u>1.1 REFERENCES</u> | .1 | Canadian Standards Association (CSA International) |
| | .1 | CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures. |
| <u>1.2 SUBMITTALS</u> | .1 | Provide submittals in accordance with Section 01 33 00 - Submittal Procedures. |
| | .2 | Shop Drawings: |
| | .1 | Provide shop drawings and product data in accordance with Section 01 33 00 - Submittal Procedures. |
| | .3 | Before proceeding with demolition of load bearing walls or of other walls and where required by authority having jurisdiction submit for review by Departmental Representative shoring and underpinning drawings prepared by qualified professional engineer registered or licensed in the Province of Newfoundland and Labrador in Canada showing proposed method. |
| | .4 | Prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal and indicate: |
| | .1 | Descriptions of and anticipated quantities in percentages of materials to be salvaged reused, recycled and landfilled. |
| | .2 | Schedule of selective demolition. |
| | .3 | Number and location of dumpsters. |
| | .4 | Anticipated frequency of tipping. |
| | .5 | Name and address of haulers waste facilities waste receiving organizations. |
| <u>1.3 DELIVERY,
STORAGE AND
HANDLING</u> | .1 | Waste Management and Disposal: |
| | .1 | Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal. |

1.4 SITE
CONDITIONS

- .1 Review designated substance report and take precautions to protect environment.
- .2 Should material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous be encountered, stop work, take preventative measures, and notify Departmental Representative immediately.
 - .1 Do not proceed until written instructions have been received from Departmental Representative.
- .3 Notify Departmental Representative before disrupting building access or services.

PART 2 PRODUCTS

2.1 EQUIPMENT

- .1 Demonstrate that tools and machinery are being used in manner which allows for salvage of materials in best condition possible.

PART 3 EXECUTION

3.1 PREPARATION

- .1 Do Work in accordance with Section 01 35 30 - Health and Safety Requirements.
- .2 Protection:
 - .1 Prevent movement, settlement, or damage to adjacent structures, utilities, and parts of building to remain in place. Provide bracing and shoring required.
 - .2 Keep noise, dust, and inconvenience to occupants to minimum.
 - .3 Protect building systems, services and equipment.
 - .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .3 Disconnect and re-route electrical, telephone and communication service lines. Post warning signs on electrical lines and equipment which must remain energized to serve other products during period of demolition.
- .4 Locate and protect utility lines. Do not disrupt active or energized utilities traversing premises designated to remain

undisturbed.

.5 Disconnect and cap designated mechanical services.

.1 Sewer and water lines: remove in accordance with requirements of authority having jurisdiction as directed by Departmental Representative.

.2 Other underground services: remove and dispose of as indicated as directed by Departmental Representative, in accordance with Section 33 71 73.02 - Underground Electrical Service.

3.2 DEMOLITION SALVAGE AND DISPOSAL

.1 Remove parts of existing building to permit new construction. Sort materials into appropriate piles for recycling.

.2 Trim edges of partially demolished building elements to tolerances as defined by Departmental Representative to suit future use.

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

3.3 PARTIAL DEMOLITION OF STRUCTURES

.1 Refer to drawings.

3.4 STOCKPILING

.1 Stockpile off site.

3.5 REMOVAL FROM SITE

.1 Transport material designated for alternate disposal by approved haulers and facilities listed in waste reduction workplan and in accordance with applicable regulations. Do not deviate from haulers and facilities receiving organizations listed in waste reduction workplan without prior written authorization from Departmental Representative.

.2 Dispose of materials not designated for alternate disposal in accordance with applicable regulations. Disposal facilities must be approved of and listed in waste reduction workplan. Do not deviate from

disposal facilities listed in waste reduction
workplan without prior written authorization
from Departmental Representative.

PART 1 GENERAL

<u>1.1 SUMMARY</u>	.1	Comply with requirements of this Section when performing following Work: <ul style="list-style-type: none">.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..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.
<u>1.2 SECTION INCLUDES</u>	.1	Requirements and procedures for asbestos abatement of asbestos containing materials of the type described within.
<u>1.3 REFERENCES</u>	.1	Canadian General Standards Board (CGSB) <ul style="list-style-type: none">.1 CAN/CGSB-1.205-94, Sealer for Application to Asbestos-Fibre-Releasing Materials.
	.2	Canadian Standards Association (CSA International)
	.3	Department of Justice Canada <ul style="list-style-type: none">.1 Canadian Environmental Protection Act (CEPA), 1999.
	.4	Health Canada/Workplace Hazardous Materials Information System (WHMIS)

- .1 Material Safety Data Sheets (MSDS).
- .5 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .6 Underwriters' Laboratories of Canada (ULC)
- .7 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 94-113-August 1994, NIOSH Manual of Analytical Methods (NMAM), 4th Edition.
- .8 U.S. Department of Labour - Occupational Safety and Health Administration - Toxic and Hazardous Substances
 - .1 29 CFR 1910.1001-2001, Asbestos Regulations.
- .9 Appendix "A" - Hazardous Building Materials Assessment.

1.4 DEFINITIONS

- .1 Airlock: 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: water with a non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.
- .3 Asbestos Containing Materials (ACMs): materials that contain 0.5 0.1 provincial regulated amount per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .4 Asbestos Work Areas: area where work takes place which will, or may disturb ACMs.
- .5 Authorized Visitors: Departmental Representatives Engineers, Consultants or designated representatives, and representatives of regulatory agencies.
- .6 Competent worker person: 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 Curtained doorway: 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: testing method used to determine integrity of Negative Pressure unit using dioctyl phthalate (DOP) HEPA-filter leak test.
- .9 Friable Materials: 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: 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.
 - .4 Straps for sealing ends around pipe.
- .11 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .12 Negative pressure: 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: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .14 Occupied Areas: any area of building or work site that is outside Asbestos Work Area.
- .15 Polyethylene sheeting sealed with tape: 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: 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 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 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 workers.
- .4 Submit layout of proposed enclosures and decontamination facilities to Departmental Representative for review.
- .5 Submit documentation including test results for sealer proposed for use.
- .6 Submit Provincial/Territorial and/or local requirements for Notice of Project form.
- .7 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.
- .8 Submit Worker's Compensation Board status and transcription of insurance.
- .9 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.
 - .3 Slow drying sealer.

1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements: 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 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

- .2 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area includes:
 - .1 Air purifying full face-mask respirator Powered air purifying respirator (PAPR) Supplied air respirator with N-100, R-100 or P-100 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 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.
- .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.
- .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 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Separate for recycling and place in designated containers steel metal plastic waste in accordance with Waste Management Plan.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .7 Fold up metal banding, flatten and place in designated area for recycling.
- .8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.

- .9 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 bound into this specification at end of this Section. 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 Engineer Consultant.

1.9 SCHEDULING

- .1 Not later than ten (10) 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.
 - .4 Disposal Authority.
- .2 Inform sub-trades of presence of asbestos containing materials identified in Existing Conditions.
- .3 Submit to Departmental Representative copy of notifications prior to start of Work.
- .4 Hours of Work: perform work involving located at during outside of normal working hours. Include in Contract Sum additional costs due to this requirement.

1.10 OWNER'S INSTRUCTIONS

- .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.
 - .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: minimum 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
- .2 FR polyethylene: minimum 0.15 mm thick, woven fibre reinforced fabric bonded both sides with polyethylene.
- .3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.
- .4 Wetting agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether, or other material approved by Departmental Representative Engineer Consultant, mixed with water in concentration to provide adequate penetration and wetting of asbestos containing material.
- .5 Waste Containers: 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.
 - .3 Labelling requirements: 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 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.
 - .5 A high strength double throw zipper and removable straps, if the bag is to be moved during the removal operation.
- .7 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.
- .8 Slow - drying sealer: 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.
- .9 Sealer: flame spread and smoke developed rating less than 50 and be compatible with new fireproofing.
- .10 Encapsulants: Type 2 surface film forming Type 1 penetrating type Class A water based conforming to CAN/CGSB-1.205 and approved by the Fire Commissioner of Canada having following characteristics:

PART 3 EXECUTION

- 3.1 PREPARATION .1 Do construction occupational health and safety in accordance with Section 01 35 29.06

- Health and Safety Requirements.

.2 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 in .
- .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.
 - .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.
- .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 Departmental Representative. Use localized water spraying during fixture removal to reduce fibre dispersal.
 - .12 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Fire Commissioner of Canada and Provincial Fire Marshall.
 - .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 Departmental Representative 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.

.3 Worker Decontamination Enclosure System:

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

- .1 Equipment and Access Room: 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: 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 water source is available. Hot water source is available. Drains to common sewers are available. 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: 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.
- .4 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: 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: 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 Holding Room: 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: build Unloading Room between Holding Room and outside, with two curtained doorways, one to Holding Room and one to outside.
- .5 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 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.
- .6 Separation of Work Areas from Occupied Areas:
 - .1 Separate parts of building required to remain in use 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.
 - .2 Cover plywood barrier with polyethylene sealed with tape, as

specified for work areas.

.7 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.

.8 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 Supervisor for every ten workers is required.
- .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:
 - .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. Use different colour for each coat. Use colour for final coat. Apply penetrating type sealer to penetrate existing sprayed asbestos surfaces to uniform depth of 25 mm minimum. 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.
- .4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial/Territorial 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 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.
- .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.

3.5 RE-
ESTABLISHMENT OF
OBJECTS AND
SYSTEMS

- .1 When cleanup is complete:
 - .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.

3.6 AIR
MONITORING

- .1 From beginning of Work until completion of cleaning operations, take air samples on daily basis outside of work area enclosure in accordance with Health Canada recommendations.
 - .1 Contractor will be responsible for monitoring 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.
 - .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.
 - .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 measure fibre content of air outside work areas by means air samples analyzed by Phase Contrast Microscopy (PCM).
 - .1 Stop Work when PCM measurements exceed 0.05 f/cc and correct procedures.
- .4 Final air monitoring to be conducted as follows: 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, 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, re-clean work area and apply another acceptable coat of lock-down agent to surfaces.
 - .3 Repeat as necessary until fibre levels are less than 0.01 f/cc.

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.
 - .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

- | | | |
|------------------------------|----|---|
| <u>1.1 SUMMARY</u> | .1 | Comply with requirements of this Section when performing following Work: |
| | .1 | Removal of lead based paint from walls ceilings using power tools with an effective dust collection system equipped with HEPA filter. |
| | .2 | Abrasive blasting of lead based paint on walls ceilings as indicated. |
| | .3 | Removal of lead-containing dust using air mist extraction system. |
|
<u>1.2 REFERENCES</u> | .1 | Canadian Standards Association (CSA International) |
| | .1 | CAN/CSA-Z180.1-00(R2005), Compressed Breathing Air and Systems. |
| | .2 | Department of Justice Canada |
| | .1 | Canadian Environmental Protection Act, 1999 (CEPA). |
| | .3 | 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 86-304 - Occupational Health and Safety Regulations. |
| | .5 | Transport Canada (TC) |
| | .1 | Transportation of Dangerous Goods Act, 1992 (TDGA). |
| | .6 | U.S. Environmental Protection Agency (EPA) |
| | .1 | EPA 747-R-95-007-1995, Sampling House Dust for Lead. |
| | .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 94-113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994). |

- .8 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances
 - .1 Lead in Construction Regulation - 29 CFR 1926.62-1993.
- .9 Underwriters' Laboratories of Canada (ULC)

1.3 DEFINITIONS

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .2 Authorized Visitors: Departmental Representative or designated representatives of regulatory agencies.
- .3 Occupied Area: area of building or work site outside Work Area.
- .4 Dioctyl Phthalate (DOP) Test: testing method used to evaluate particle penetration and air flow resistance properties of filtration materials - HEPA filter leak test.
- .5 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Appropriate capacity for scope of work.
- .6 Airlock: ingress or egress system without permitting air movement between contaminated area and uncontaminated area. Consisting of two curtained doorways at least 2 m apart.
- .7 Curtained doorway: 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 add weight to bottom edge to ensure proper closing.

- .3 Overlap each polyethylene sheet at openings 1.5 m on each side.
- .8 Action level: 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 8-hour time-weighted average (TWA). Maximum precautions for lead abatement are based on airborne lead concentrations greater than 1.25 milligrams per cubic meter of air within Work Area.
- .9 Competent person: individuals, Departmental Representative capable of identifying existing lead hazards in workplace and taking corrective measures to eliminate them.
- .10 Lead in Dust: wipe sampling on the 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: extracts air directly from work area and filters extracted air through a HEPA filter, discharge air to exterior of building.
 - .1 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.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 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.
- .3 Provide: Provincial and local requirements for Notice of Project Form.
- .4 Provide proof of Contractor's General Liability Insurance.

.5 Quality Control:

- .1 Provide Departmental Representative necessary permits for transportation and disposal of lead based paint waste and proof it has been received and properly disposed.
- .2 Provide proof satisfactory to Departmental Representative that employees 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 days duration, approved by Departmental Representative. Minimum of one supervisor for every ten workers.

.6 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.
 - .3 Slow drying sealer.

1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial 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.
- .2 Health and Safety:
 - .1 Require construction work to be in compliance with the occupational health and safety regulations in 01 35 30 - Health and Safety Requirements
 - .2 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: 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 Abrasive blasting of lead paint: 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 full-face-piece. Compressed air used to supply supplied air respirators to meet breathing air purity requirements of CAN/CSA-Z180.1. Where an oil-lubricated compressor is used to supply breathing air, a continuous carbon monoxide monitor/alarm to be provided.

.3 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.

.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.
- .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 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 Lead 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:
 - .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.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
- .3 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.
- .4 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.7 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 bound into this specification.
- .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 .

1.8 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.
- .4 Hours of Work: perform work outside of normal working hours. Include in Contract Sum additional costs due to this requirement.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Polyethylene 0.15 mm unless otherwise specified; in sheet size to minimize joints.
- .2 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.
- .3 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for trapping residual lead paint residue.
- .4 Lead waste containers: metal type acceptable to dump operator with tightly fitting covers and 0.15 mm sealable polyethylene liners.
 - .1 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 Work Area during disturbance, removal, or 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 lead dust and particulate dispersal into other building areas. Conduct smoke tests to ensure duct work is airtight.
- .2 Pre-clean fixed casework, and equipment within work areas, using HEPA vacuum and cover with polyethylene sheeting sealed with 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 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.
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 by use of appropriately sized hoses for application of water as required.

- .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 lines 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:
construct between exit and work areas, with two curtained doorways, one to the rest of the 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.

Clean Room: 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 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 closure comprising doorway always remains closed.
 - .3 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.
- .2 Individual controls inside to regulate water flow and temperature.
- .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 metal stud framing, cover with polyethylene sheeting and seal with duct tape. Apply 9 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 tidy 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 working 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 using power tools that are attached to dust-collecting vacuums with HEPA filters.
- .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 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 project. 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 8 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.

3.4 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.
- .2 Departmental Representative will inspect work for:
 - .1 Adherence to specific procedures and materials.

- .2 Final cleanliness and completion.
- .3 No additional costs will be allowed for additional labour or materials required to provide specified performance level.

.3 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.

3.5 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 Engineer Consultant and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period of 8 hours has passed, Departmental Representative will perform lead wipe sampling in Work Area.

- .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 dust 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 lead dust 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.

- .3 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.

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 SECTION
INCLUDES

- .1 Procedures and materials required for the safe handling, management and storage of polychlorinated biphenyl (PCB) material.

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/2000-102, Storage of PCB Material Regulations
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .4 Environment Canada
 - .1 Manual for Spills of Hazardous Materials-1985.
- .5 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .6 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 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prior to starting work, Contractor performing work of this section to provide:

.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.

.6 Material Safety Data Sheets for chemicals or material to be used.

.3 Submittals to Local 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.

.4 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.

.7 Fire detection systems in place at storage site.

1.4 CONTROL SUBMITTALS

.1 Co-ordinate procedural requirements with Section 01 45 00 - Testing and Quality Control.

.2 Record keeping: maintain and make

available for review by environmental officer 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.
 - .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.
 - .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 Co-ordinate with Section 01 45 00 - Testing and Quality Control.
- .2 Instruct personnel on dangers of PCB exposure, respirator use, decontamination and applicable Federal, Provincial and Municipal Regulations.
- .3 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.
- .4 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.
- .2 One supervisor for every 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 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, Territorial 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: 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: 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.

- .3 For each PCB Article not in PCB Container or PCB Article Container: 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 Authority having jurisdiction.

2.2 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 storage.
 - .1 Drums and containers:
 - .1 Designed with sufficient durability and strength to prevent PCB solids liquids from being released into environment, affected by weather, or contaminated by external sources.
 - .2 Steel, other material approved by Departmental Representative.
 - .2 Drums:
 - .1 Capacity no greater than 205 litres.
 - .2 Steel of minimum 1.2 mm for solids 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.

2.3 EMERGENCY
RESPONSE EQUIPMENT
AND SYSTEMS

.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: Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.

- .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.
 - .1 Supplied-air respirator with full face piece, helmet or hood.
 - .2 Self-contained breathing

apparatus with full face piece.

.3 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 of continuous flow mode and auxiliary self-contained breathing apparatus operated in positive pressure mode.

2.4 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 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 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 in accordance with Manual of Spills of Hazardous Materials .

.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 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 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 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 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 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Store PCB waste materials to CEPA SOR/92-507.
- .3 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.
- .4 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.

- .5 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".
- .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.

- .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 Store fluid 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.
 - .2 PCB fluid concentration no greater than 50 ppm

- verified by 90-day test.
- .2 Askarel transformers:
 - .1 Decontaminate by series retrofilling.
 - .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 years at five year intervals.
 - .5 Porous materials:
 - .1 Considered PCB waste unless shown otherwise.
 - .2 Separated and stored, 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:
 - .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 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

- rag s 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 local 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.
 - .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 local 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 local 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.
 - .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:
 - .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 PCB's 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.
- .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 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/Territorial 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 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
Engineer Consultant.
 - .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.
- .6 Reports:

- .1 Prepare and submit a remediation closeout report at completion of Work.

3.10 FIELD
QUALITY CONTROL

.1 Owners or Operators of Storage Sites:

- .1 At request of inspector, measure concentration of PCBs in accordance with CEPA SOR/92-507 - Storage of PCB Material Regulations.
- .2 Inspect storage site monthly and repair or replace, if necessary, PCB equipment, floors, drains, drainage systems, waterproof roofs or barriers, fire prevention apparatus, personnel protection equipment, security fences and materials used for clean-up at site.
- .3 Immediately repair or replace drum, container or equipment found to be leaking PCBs.
- .4 Immediately clean up contaminated area.
- .5 Ensure controlled access to storage site to prevent entry by unauthorized persons.