PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 35 29.06 - Health and Safety Requirements.

.3 Section 01 35 43 - Environmental Procedures.

.4 Section 01 45 00 - Quality Control.

.5 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.6 Section 02 81 01 - Hazardous Materials.

.7 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

1.2 REFERENCES

.1 Department of Justice Canada (Jus).
- .1 Canadian Environmental Assessment Act, 2012 (CEAA)
- .2 Canadian Environmental Protection Act, 1999 (CEPA), c. 33.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
- .1 Material Safety Data Sheets (MSDS).

.3 Transport Canada (TC).
- .1 Transportation of Dangerous Goods Act, 1992 (TDGA), c. 34.

1.3 DEFINITIONS

.1 Demolition: rapid destruction of building following removal of hazardous materials.

.2 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.

.3 Waste Audit (WA): detailed inventory of materials in building. Indicates quantities of reuse, recycling and landfill.
- .1 Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project.
- .2 Indicates quantities of reuse, recycling and landfill.

.4 Waste Management Coordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related required submittal and reporting requirements.

.5 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. WRW based on information acquired from WA.

1.4 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data: submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.

.3 Shop drawings.
.1 Submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning, where required by Authorities Having Jurisdiction.
.2 Submit drawings stamped and signed by qualified professional engineer registered or licensed in Ontario.

.4 Hazardous Materials: provide description of Hazardous Materials and Notification of Filing with proper authorities prior to beginning of Work as required.

.5 Waste Reduction Workplan: 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 tippage.
.5 Name and address of haulers, waste facilities and waste receiving organizations.

.6 Certificates: submit copies of certified weigh bills, bills of lading, and receipts from authorized disposal sites and reuse and recycling facilities for material removed from site to Departmental Representative weekly.
.1 Written authorization from Departmental Representative is required to deviate from haulers, facilities, and receiving organizations listed in Waste Reduction Workplan.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable Provincial and Municipal regulations.

.2 Site Meetings.
.1 Convene pre-installation meeting one week prior to beginning work of this Section and Section 01 32 16.06 - Construction Progress Schedules – Critical Path Method (CPM) to:
.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Co-ordination with other building subtrades.
.2 Arrange for site visit with Departmental Representative to examine existing site conditions adjacent to demolition work, prior to start of Work.
.3 Hold project meetings every month.
.4 Ensure key personnel, site supervisor, project manager, subcontractor representatives and WMC attend.
.5 Reporting Requirements: WMC to complete.
.6 WMC must provide written verbal report on status of waste diversion activity at each meeting.
.7 Departmental Representative will provide written verbal notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Perform Work in accordance with Section 01 35 43 - Environmental Procedures.

.2 Storage and Protection.
.1 Protect in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

.2 Remove and store materials to be salvaged, in manner to prevent damage.
.3 Store and protect in accordance with requirements for maximum preservation of material.
.4 Handle salvaged materials as new materials.

.3 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 Divert excess materials from landfill.
.3 Separate for reuse and recycling and place in designated containers waste in accordance with Waste Management Plan.
.4 Place materials defined as hazardous or toxic in designated containers.
.5 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Provincial and Municipal regulations.
.6 Label location of salvaged material's storage areas and provide barriers and security devices.
.7 Ensure emptied containers are sealed and stored safely.
.8 Source separate for recycling materials that cannot be salvaged for reuse including wood, metal, concrete and asphalt, and gypsum.
.9 Remove materials that cannot be salvaged for reuse or recycling and dispose of in accordance with applicable codes at licensed facilities.

1.7 SITE CONDITIONS .1 Site Environmental Requirements.
.1 Perform work in accordance with Section 01 35 43 - Environmental Procedures.
.2 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
.3 Do not dispose of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
.1 Ensure proper disposal procedures are maintained throughout the project.
.4 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.
.5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities and as directed by Departmental Representative.
.6 Protect trees, plants and foliage on site and adjacent properties where indicated.

1.8 SCHEDULING .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion. Notify Departmental Representative in writing when unforeseen delays occur.

PART 2 - PRODUCTS

2.1 EQUIPMENT .1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Inspect site with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

.3 Notify and obtain approval of utility companies before starting demolition.

.4 Disconnect and cap designated services.
- .1 Natural Gas Supply Lines: remove in accordance with gas company requirements.
- .2 Sewer and Water Lines: remove to designated point in accordance with authority having jurisdiction and securely plug to form watertight seal.
- .3 Other Underground Services: remove and dispose of as indicated.

3.2 REMOVAL OPERATIONS - GENERAL

.1 Remove items as indicated and within the Limit Contract Area as follows:
- .1 Concrete curbs, sidewalks and stairs.
- .2 Asphalt pavement.
- .3 Site furnishings including benches, planters.
- .4 Traffic, parking control, building identification and other signage.
- .5 Guardrails and handrails.
- .6 Unit pavers, stone and rock hard surfacing.
- .7 Trees (where designated), shrubs, flowers and planters.
- .8 Sheds and wood structures.
- .9 Gravel paths.
- .10 Water mains and associated infrastructure.
- .11 Storm sewers, catch basins, manholes and associated infrastructure.
- .12 Sanitary sewers, manholes and associated infrastructure.
- .13 Underground electrical services, manholes and associated infrastructure.
- .14 Underground communications network, manholes and associated infrastructure.

.2 Remove footings and foundations associated with items identified in paragraph 3.2.1.

.3 Remove base courses and non-native backfill associated with items identified in paragraph 3.2.1 to expose undisturbed soil.

3.3 REMOVAL OPERATIONS

.1 Do not disturb items designated to remain in place.

.2 Removal of pavements, curbs and gutters:
- .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Departmental Representative.
- .2 Protect adjacent joints and load transfer devices.
- .3 Protect underlying and adjacent granular materials.

.3 Prevent contamination with base course aggregates, when removing asphalt pavement for subsequent incorporation into hot mix asphalt concrete paving,

.4 Excavate at least 300 mm below pipe invert, when removing pipes.

.5 Remove designated trees during demolition. Obtain written approval of Departmental Representative prior to removal of trees not designated.

.6 Sell, donate, or dispose of alternately, trees designated for removal and identified by Departmental Representative to be healthy marketable. Grind, chip, or shred other vegetation for mulching and composting, or use as mill pulp or process fuel.

.7 Stockpile topsoil for final grading and landscaping. Provide erosion control and seeding if not immediately used.

.8 Stockpile granular base course materials and back fill materials for re-use.

.9 Salvage coursed rubble stone of retaining walls. Deliver to location identified by Departmental Representative.

.10 Disposal of Material: Dispose of materials not designated for salvage or reuse on site at authorized facilities approved in Waste Reduction Workplan.

.11 Backfill: Backfill in areas as indicated and in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3.4 STOCKPILING

.1 Label stockpiles, indicating material type and quantity.

.2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.

.3 Locate stockpiled materials convenient for use in new construction to eliminate double handling wherever possible.

.4 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

3.5 REMOVAL FROM SITE

.1 Remove stockpiled material when it interferes with operations of project.

.2 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.

.3 Transport material designated for alternate disposal using approved haulers, facilities and receiving organizations listed in Waste Reduction Workplan and in accordance with applicable regulations.

.1 Written authorization from Departmental Representative is required to deviate from haulers, facilities, and receiving organizations listed in Waste Reduction Workplan.

.4 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.

.1 Disposal Facilities: approved and listed in Waste Reduction Workplan.

.2 Written authorization from Departmental Representative is required to deviate from disposal facilities listed in Waste Reduction Workplan.

3.6 RESTORATION

.1 Restore areas and existing works outside areas of demolition to conditions that existed prior to beginning of Work.

.2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

3.7 CLEANING

.1 Remove debris, trim surfaces and leave work site clean, upon completion of Work

.2 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS .1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.2 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 Divert unused asphalt materials from landfill to local quarry or facility approved by Departmental Representative.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 PREPARATION .1 Prior to beginning removal operation, inspect and verify with Departmental Representative areas, depths and lines of asphalt pavement to be removed.

3.2 PROTECTION .1 Protect existing pavement not designated for removal, light units and structures from damage. In event of damage, immediately replace or make repairs to approval of Departmental Representative at no additional cost.

3.3 REMOVAL .1 Remove existing asphalt pavement to lines and grades as indicated.

.2 Prevent contamination of removed asphalt pavement by topsoil, underlying gravel or other materials.

.3 Provide for suppression of dust generated by removal process.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Methods and procedures for deconstruction of structures and parts of structures.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 35 29.06 - Health and Safety Requirements.

.3 Section 01 35 43 - Environmental Procedures.

.4 Section 01 35 73 - Procedures for Deconstruction of Structures.

.5 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.6 Section 02 81 01 - Hazardous Materials.

1.3 REFERENCES

.1 Canadian Standards Association (CSA International).
- .1 CSA S350-M1980 (R2003), Code of Practice for Safety in Demolition of Structures.

.2 Federal Legislation.
- .1 Canadian Environmental Assessment Act (CEAA), 2012
- .2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
- .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.4 DEFINITIONS

.1 Alternate Disposal: reuse and recycling of materials by designated facility, user or receiving organization which has valid Certificate of Approval to operate. Alternative to landfill disposal.

.2 Deconstruction: systematic dismantling of structure in a manner that achieves safe removal/disposal of hazardous materials and maximum salvage/recycling of materials. Ultimate objective is to recover potentially valuable resources while diverting from landfill what has traditionally been significant portion of waste system.

.3 Demolition: rapid destruction of structure with or without prior removal of hazardous materials.

.4 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, including but not limited to: corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health, well being or environment if handled improperly.

.5 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.6 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.7 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
- .1 Salvaging reusable materials from remodelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
- .2 Returning reusable items including pallets or unused products to vendors.

.8 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.

.9 Source Separation: acts of keeping different types of waste materials separate, beginning from first time they became waste.

.10 Waste Management Coordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related required submittal and reporting requirements.

1.5 PERFORMANCE REQUIREMENTS

.1 Divert a minimum of 75 percent of waste from landfill sites.

1.6 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit pre-demolition audit and deconstruction/disassembly plan prior to starting work in accordance with Section 01 35 73 - Procedures for Deconstruction of Structures.

.3 Submit copies of certified weigh bills, bills of lading, and used building material receipts from authorized disposal sites and reuse and recycling facilities for material removed from site to Departmental Representative on weekly basis.
- .1 Written authorization from Departmental Representative is required to deviate from haulers, facilities, and receiving organizations listed in Waste Reduction Workplan.

.4 Include following information:
- .1 Time and date of removal.
- .2 Description of materials.
- .3 Weight, volume, and quantity of material.
- .4 Breakdown of reuse, recycling and landfill percentages and quantities.
- .5 End destination of materials.

.5 Workers, haulers and subcontractors must possess current, applicable Certificates of Approval and permits to remove, handle and dispose of wastes categorized Provincially or Municipally as hazardous.
- .1 Provide proof of compliance within 24 hours upon written request of Departmental Representative.

1.7 QUALITY ASSURANCE

.1 Ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable Provincial and Municipal regulations.

1.8 STORAGE, HANDLING AND PROTECTION

.1 Do in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.9 ENVIRONMENTAL REQUIREMENTS

.1 Do Work in accordance with Section 01 35 43 - Environmental Procedures.

.2 Refer to Section 01 35 73 - Procedures for Deconstruction of Structures.

1.10 SITE CONDITIONS

.1 Existing Conditions.

.1 Should undocumented materials resembling spray or trowel applied asbestos or other designated substances be encountered in course of deconstruction, stop work, take preventative measures, and notify Departmental Representative immediately. Do not proceed until written instructions have been received.

.2 Label and package component parts of mechanical and electrical material specified for salvage in accordance with Departmental Representative's instructions or as specified to prevent damage or loss.

.2 Protection.

.1 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, landscaping, adjacent grades. Provide bracing, shoring, or underpinning as required. Repair damage caused by deconstruction as directed Departmental Representative.

.2 Support affected structures and, if safety of structure being deconstructed or adjacent structures and services appears to be endangered, take preventative measures. Cease operations and immediately notify Departmental Representative.

.3 Prevent debris from blocking surface drainage system and site services.

PART 2 - PRODUCTS

2.1 EQUIPMENT

.1 Leave equipment and machinery running only while in use, except where extreme temperatures prohibit shutting down.

.2 Use water efficient wetting equipment/trucks/attachments when minimizing dust.

.3 Demonstrate that tools 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 29.06 - Health and Safety Requirements.

.2 Disconnect and re-route electrical, telephone, cable TV, and communication service lines entering buildings to be deconstructed. Post warning signs on electrical lines and equipment which must remain energized to serve other products during period of demolition.

.3 Locate and protect utility lines. Do not disrupt active or energized utilities traversing site or designated to remain undisturbed.

.4 Disconnect and cap designated mechanical services.
- .1 Natural gas supply lines: remove in accordance with utility company requirements.
- .2 Storm sewer, sanitary sewer and water lines: remove in accordance with requirements of authority having jurisdiction.
- .3 Other underground services: remove and dispose of as indicated.

3.2 REMOVAL OF HAZARDOUS WASTES

.1 Prior to start of deconstruction work, remove contaminated or hazardous materials from site and dispose of at designated disposal facilities, in safe manner in accordance with TDGA and other applicable regulatory requirements, and in accordance with Section 02 81 01 - Hazardous Materials.

3.3 DISASSEMBLY

.1 Unless otherwise noted, materials removed from site and designated structures are property of Contractor.

.2 Throughout course of deconstruction pay close attention to connections and material assemblies. Employ workmanship procedures which minimize damage to materials and equipment.

.3 Ensure workers and subcontractors are briefed and trained to carry out work in accordance with appropriate deconstruction techniques.

.4 Project supervisor with previous deconstruction experience must be present on site throughout project.

.5 Deconstruct in accordance with CSA S350 and other applicable safety standards.

.6 Workers must utilize adequate fall protection and/or certified harness and belay systems where warranted.

.7 Maintain structural integrity of structure.

.8 Systematically remove finishes, furnishings, and mechanical and electrical equipment as indicated.

.9 Carefully remove windows and doors from structure.

.10 Disassemble non-loadbearing interior partitions and remove materials from structure.

.11 Disassemble in sequence: roof, interior loadbearing partitions, exterior walls, floors, and foundation. Pile caps and piles may remain.

.12 Wherever possible, transfer material assemblies from heights to ground level for easier disassembly. Take appropriate measures to ensure safety.

.13 Separate from waste stream, material designated for alternate disposal, in condition suitable for reuse and/or recycling, and as listed to required rates of diversion.

.14 Remove and store materials to be salvaged, in manner to prevent damage.
- .1 Store and protect in accordance with requirements for maximum preservation of material.
- .2 Handle salvaged materials as new materials.

.15 Source separate for recycling materials that cannot be salvaged for reuse including wood, metal, concrete and asphalt.

.16 Remove materials that cannot be salvaged for reuse or recycling and dispose of in accordance with applicable codes at licensed facilities.

.17 Demolition work, if employed, may utilize any method or combination of methods including, but not limited to, implosion, explosion, hydraulic or mechanical techniques. Secure the approval of all Authorities Having Jurisdiction for demolition work. Demolition work may only occur after hazardous materials are removed. Demolition work must not compromise the Performance Requirements identified in Subsection 1.5.1. Undertake any demolition work in accordance with the approved deconstruction/disassembly plan as per Section 01 35 73, Subsection 1.4.9.

3.4 TURN OVER

.1 Carefully remove and turn over to the Departmental Representative selected materials and components as noted below or on the Drawings. These materials and components include the following:
- .1 electrical switchgear
- .2 electrical transformer

.2 Inventory turned over materials.

.3 Crate and protect turned over materials for long-term storage.

.4 Deliver, unload and place in final storage position all turned over materials as directed by the Departmental Representative. Delivery will be to a location within 10 km of the site.

3.5 PROCESSING

.1 Designate location for processing of materials which eliminates double handling and provides adequate space to maintain efficient material flow.

.2 Denail, strip, and separate, materials to ensure best possible condition of salvaged materials.

.3 Keep processing area clean and free of excess debris.

.4 Supply separate, marked disposal bins for categories of waste material. Do not remove bins from site until inspected and approved by Departmental Representative.

.5 Separate processed materials into organized piles for stockpiling. Provide collection area for materials processed, listed, and designated for alternate disposal. Pile materials on pallets to facilitate transport off-site or to storage areas.

3.6 STOCKPILING

.1 Label stockpiles, indicating material type and quantity.

.2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.

.3 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

3.7 REMOVAL FROM SITE

.1 Transport material designated for alternate disposal by approved haulers to facilities and receiving organizations listed in Waste Reduction Workplan and in accordance with applicable regulations. Do not deviate from haulers, facilities, and 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.

3.8 CLEANING AND RESTORATION

.1 Keep site clean and organized throughout deconstruction.

.2 Upon completion of project, remove debris, trim surfaces and leave work site clean.

.3 Upon completion of project, reinstate landscaped areas, parking surfaces, walkways, curbs, roadways and light standards, affected by Work to condition which existed prior to beginning of Work.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 02 82 00.01 – Asbestos Abatement: Minimum Precautions.

.2 Section 02 82 00.02 – Asbestos Abatement: Intermediate precautions.

.3 Section 02 82 00.03 – Asbestos Abatement: Maximum precautions.

.4 Section 02 84 00 – PCB Remediation.

.5 Section 02 83 20 – Lead Abatement.

.6 Section 02 87 00 – Mercury Precautionary Measures.

.7 Section 02 89 00 – Silica Precautionary Measures.

1.2 REFERENCES

.1 Work site may involve contact with the following:
(refer to Schedule A: Designated Substances / Hazardous Materials within this section).

.1 Asbestos

.2 Lead

.3 Mercury

.4 Silica

.5 PCBs

.6 ODSs

.7 Miscellaneous Chemicals

.8 Coal and Soot Associated with former Boilers

.9 Rodent Droppings

.10 Mould

.2 Canadian Environmental Protection Act,1999 (CEPA 1999).

.1 Export and Import of Hazardous Waste Regulations (SOR/2002-300).

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 National Fire Code of Canada 2010.

.5 Transportation of Dangerous Goods Act (TDG Act) 1999, as amended (c. 34).

.6 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2003-400).

1.3 DEFINITIONS

.1 Dangerous Goods: product, substance, or organism that is specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 Hazardous Material: product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.3 Hazardous Waste: any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.4 Workplace Hazardous Materials Information System (WHMIS): Canada-wide system designed to give employers and workers information about hazardous materials used in workplace. Under WHMIS, information on hazardous materials is provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by combination of federal and provincial laws.

1.4 ACTION AND INFORMATION SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit to Departmental Representative current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.

.3 Submit hazardous materials management plan to Departmental Representative that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Co-ordinate storage of hazardous materials with 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 current National Fire Code of Canada requirements.

.4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.

.1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.

.2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative .

.5 Transfer of flammable and combustible liquids is prohibited within buildings.

.6 Do not transfer of flammable and combustible liquids in vicinity of open flames or heat-producing devices.

.7 Do not use flammable liquids having flash point below 38 degrees C, such as naptha or gasoline as solvents or cleaning agents.

.8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.

.9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.

.10 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 not mixed.

.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.

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

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

1.6 TRANSPORTATION

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

.2 If hazardous waste is generated on site:

.1 Co-ordinate transportation and disposal with Departmental Representative.

.2 Ensure compliance 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 Prior to shipping material obtain written notice from intended hazardous waste treatment or disposal facility that it will accept material and that it is licensed to accept this material.

.5 Label container[s] with legible, visible safety marks as prescribed by federal and provincial regulations.

.6 Ensure that trained personnel handle, offer for transport, or transport dangerous goods.

.7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.

.8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide a photocopy of completed manifest to Departmental Representative.

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

Part 2 Products

2.1 MATERIALS

.1 Only bring on site quantity of hazardous materials required to perform work.

.2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

Part 3 Execution

3.1 DISPOSAL

.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 landfills 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.

.8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:

.1 Hazardous wastes recycled in manner constituting disposal.

.2 Hazardous waste burned for energy recovery.

.3 Lead-acid battery recycling.

.4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian Council of Ministers of the Environment (CCME)
- .1 CCME PN 1326-2003, Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products.
- .2 CCME PN 1299-2006, Canadian Environmental Quality Guidelines.
  - .1 Chapter 7-2006, Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health.

.2 Canadian Federal Legislation
- .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
  - .1 Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations, SOR/2008-197
- .2 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.
- .3 Canada Labour Code (R.S. 1985, c. L-2).
  - .1 Part II (September 2000) - Occupational Health and Safety.
- .4 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Provide written storage tank description in accordance with Section 01 33 00 - Submittal Procedures.

.3 Provide the following information on storage tank:
- .1 Former contents.
- .2 Location.
- .3 Reason for removal.

.4 Provide Departmental Representative with copy of vapour removal test results.

.5 Forward affidavit of destruction of underground storage tanks to authority having jurisdiction.

1.3 QUALITY ASSURANCE

.1 Contractor must be licensed/certified by Province authorities having jurisdiction for removal of underground storage tanks.
- .1 License/certificate, title and number must accompany tender document.
- .2 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA, TDGA and applicable Provincial regulations.

1.4 DELIVERY, STORAGE AND HANDLING

.1 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 Divert metal materials from landfill to metal recycling facility approved by Departmental Representative.

.3 Segregate and deliver non-salvageable or non-recyclable materials, including waste liquids and sludges to Provincially/Territorially licensed waste facility.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 PREPARATION SAFETY AND SECURITY

.1 Conform to or exceed Federal and Provincial codes, local municipal by-laws, by-laws, and codes and regulations of utility authorities having jurisdiction. Comply with Section 45 of the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

.2 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Protection:
- .1 Meet safety requirements of Occupational Safety and Health, Canada Labour Code Part II and Regulations for Construction Projects.
- .2 Disconnect or remove source of ignition from vicinity of tank.
- .3 Provide temporary protection for safe movement of personnel and vehicle traffic.
- .4 Cut, braze or weld metal only in monitored areas established to be free of ignitable vapour concentrations.
- .5 Ground and bond metal equipment, including tanks and transfer pipes, before operating equipment or transferring flammable materials.
- .6 Use non-sparking tools and intrinsically safe electrical equipment.
- .7 Smoking is not permitted.

3.2 DRAINING

.1 Drain and flush piping into tank.

.2 Pump out liquid from tank
- .1 Use explosion proof, air driven or hand pump.

.3 Remove sludge from tank bottom.
- .1 Dispose of product and sludge in accordance with local, Provincial and Territorial regulations using waste disposal carrier licensed by Provincial/Territorial Environmental Agency having jurisdiction.

3.3 EXCAVATION TRENCHING AND BACKFILL

.1 Do work in accordance with Section 31 23 33.01 - Excavation, Trenching and Backfilling.

.2 Provide protective material around excavation.

.3 Provide constant supervision during excavation and backfilling.

.4 Excavation:
- .1 Excavate until top of tank and connections and openings are exposed.
- .2 Disconnect piping:
  - .1 Remove fill tube.
  - .2 Disconnect fill gauge, product and vent lines.

.3 Cap or plug open ends of lines that are not to be used further.
.4 Remove piping from ground.

.3 Temporarily plug tank openings.
.4 Continue excavation until tank is completely exposed.
.5 Temporarily stockpile on site soil in vicinity of tank, until waste classification can be established prior to final disposal.

.5 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, landscaping and adjacent grades. Provide bracing and shoring as required.

3.4 TANK REMOVAL

.1 Remove tank in accordance with CCME Code of Practice PN 1326 and/or applicable provincial standards and regulations, and place in secure location.

.2 Block tank to prevent movement.

.3 Contact Departmental Representative immediately if there is evidence of contamination in tank excavation, stop Work until further notice.

.4 Remove and replace contaminated soil and accumulated flammable or combustible liquid with clean fill common to local area in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3.5 VAPOUR REMOVAL

.1 Purging:
.1 Purge vapours to less than 10% of lower explosive limit (LEL).
.2 Verify with combustible gas metre.

3.6 CAPPING

.1 Plug holes after tank has been freed of vapours and before tank is moved from site.
.1 Leave vents open.

.2 Plug corrosion leak holes using screwed (boiler) plugs.

.3 Leave 3 mm vent hole in one plug to prevent tank from being subjected to excessive pressure differential caused by extreme temperature change.

3.7 SECURING AND REMOVAL FROM SITE

.1 Check vapour levels prior to transport:
.1 Remove vapour if required.

.2 Dispose of tank in accordance with local, Provincial, Federal or Territorial regulations.

.3 Truck removal:
.1 Secure tank on truck for transport to disposal site.
.2 Cut suitable openings in tank sides to render tank unusable.
.3 Ensure 3 mm vent hole located at uppermost point on tank.

3.8 WORKMANSHIP AND DISPOSAL

.1 Tanks destined for disposal:

.1 Dismantle, cut sufficient openings or otherwise render unusable.

END OF SECTION

SCHEDULE A: DESIGNATED SUBSTANCES/ HAZARDOUS MATERIALS [Note 1]

Environmental Issue	Area of Concern	Recommended Action
Asbestos	Friable and non-friable asbestos is present within the work area. Any disturbance or removal of these materials shall be performed by a qualified contractor. These materials are outlined within the survey report referenced within this section.	Appropriate asbestos abatement practices must be utilized during the removal of asbestos-containing materials, including the use of proper personal protective equipment, as per Ontario Occupational Health and Safety Act, R.S.O., 1990, O. Reg. 278/05, *Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, as amended*. Asbestos waste is to be disposed of in accordance with O. Reg. 347/90, as amended, *General Waste Management*. Perform asbestos disturbance or removal in accordance with the requirements of Sections 02 82 00.01, 02 82 00.02, and 02 82 00.03
Polychlorinated Biphenyls (PCBs)	PCBs are suspected present in select fluorescent light ballasts. One (1) oil-cooled transformer was observed disconnected and on a wood skid along the exterior west side lot of the building. One (1) pad mounted oil-cooled transformer was observed on the Southwest lawn adjacent to the building. These transformer may contain oil which contains PCBs.	Confirm PCB content of all light ballasts prior to disposal using *Identification of Lamp Ballasts Containing PCBs,* by Environment Canada EPS 2/CC/2 (revised), August 1991. Assume oil-cooled transformers contain oil which contains PCBs and treat as such. Oil may be subject to testing for PCB content. Any PCB-containing equipment removed shall be disposed of in accordance with Specification Section 02 84 00 *PCB Remediation*, O. Reg. 362/90, as amended; O. Reg. 347/90, as amended; and Transportation of Dangerous Goods Act.
Lead	Lead has been confirmed to be present in concentrations that may result in a health risk during demolition activities. Painted	If lead containing materials are disturbed, proper precautionary measures should be followed, as outlined in Specification Section 02 830 20 *Lead Abatement*,

Environmental Issue	Area of Concern	Recommended Action
	surfaces with confirmed concentrations of lead were noted within the work area. All paints/coatings shall be assumed to be lead containing. Emergency light batteries are suspected to contain lead. Solder used on copper pipes may contain lead. Old drain pipe joint caulking may contain lead.	O. Reg. 490/09, as amended; *Designated Substance*; *Ontario Ministry of Labour - Guideline: Lead on Construction Projects*. Lead is to be disposed of in accordance with O. Reg. 347/90, as amended, *General Waste Management*. TCLP analysis was completed on representative paints on metal brackets in the CHP Distribution Tunnel (T-L-01, T-L-02), grey painted floor slab (Basement)(L-01), ceramic tile (L-02), green, grey, white painted concrete block wall (L-03 to L-05). The TCLP results indicated that these paints and materials are not considered solid hazardous waste with respect to lead.
Mercury	Mercury vapour is present in fluorescent light tubes located throughout the work area. Mercury is suspected to be present in thermometers, thermostats, and other mechanical equipment.	Should fluorescent light tubes, thermostats, thermometers, pressure gauges, electrical switches and other mechanical equipment containing mercury be removed for recycling or disposal, as applicable, it shall be done in accordance with Specification Section 02 87 00 *Mercury Precautionary Measures,* O. Reg. 844, as amended, *Designated Substance – Mercury*; and O. Reg. 347/90, as amended, *General Waste Management*.
Silica	Free crystalline silica is present within concrete elements, concrete floor slabs, walls, foundations, drywall and hard plaster finishes throughout the project area. It is also present in pipe fittings and other insulation materials.	Appropriate work practices must be utilized during the disturbance of these structures in accordance with Specification Section 02 89 00 *Silica Precautionary Measures*, O. Reg. 845, as amended, *Designated Substance – Silica;* and *Ontario Ministry of Labour - Guideline: Silica on Construction Projects*.

Environmental Issue	Area of Concern	Recommended Action
Ozone-Depleting Substances	Suspect ODSs were observed within the facility in air dryers, air conditioning units and miscellaneous small refrigeration units.	The handling, transport and disposal of ODSs are governed by O. Reg 189/94, as amended, *Refrigerants* and Federal Halocarbon Regulation 2003. The ODS refrigerants must be captured and reclaimed by a licensed technician prior to dismantling or disposal.
Miscellaneous Chemicals	Miscellaneous chemicals (e.g. acids, bases, water treatment chemicals, aerosols, spray sealants, lubricants, cleaners, degreasers, compressor fluid, etc.) are present throughout the building. A bulk storage vat marked as containing a corrosive liquid was observed in the basement of the building. Solid water treatment materials (possibly ion exchange beads) spilling out from bags onto the concrete floor in the northeast section of the Make-up tank Level were also observed. Waste oil drums (approx. 200 L) were observed in the Basement and Garage area of the building. Two drums (approx. 200 L) with unknown contents were located on the exterior Southwest side of the building. Two (2) large propane tanks were located on the exterior West side of the building.	The handling and use of miscellaneous chemicals should be undertaken by those with proper training (e.g. Workplace Hazardous Materials Information System, etc.), and adhere to any applicable guidelines and/or regulations. Prior to building decommissioning, they should be re-used elsewhere (if appropriate) or disposed of appropriately. The transport and disposal of chemical waste is governed by the Transportation of Dangerous Goods Act, and O. Reg. 347/90 – General – Waste Management, as amended. Propane tanks, and any contents, should be handled and disposed of appropriately.
Coal and Combustion Material Associated with former Boilers	A limited visual evaluation of the Coal Bunkers showed some dust but no obvious coal debris. Soot and other debris were noted in the soot ('heavies") collectors at each of the induced fan units.	During decommissioning, measures to control residual dust levels (e.g. wetting) should be used to control possible dust emissions. Dermal and respiratory protection may be required. TCLP analysis was completed on a representative sample of soot collected from one of the soot collectors (SOOT – 1). The TCLP results indicated that the soot contains levels of arsenic that classify the soot as

Environmental Issue	Area of Concern	Recommended Action
		leachate toxic waste. The transport and disposal of this waste is governed by the Transportation of Dangerous Goods Act, and O. Reg. 347/90 – General – Waste Management, as amended.
Rodent droppings	Rodent droppings were observed on the Kitchen counter top and above the false ceiling in a few areas of the Ground Floor.	Animal fecal matter be cleaned and removed following the appropriate work procedures given in the document Mould Guidelines for the Canadian Construction Industry CCA 82-2004 published by the Canadian Construction Association (CCA 82-2004). Following clean-up, packaging and disposal of all animal fecal matter impacted waste should be performed in such a manner as to avoid cross-contamination of unaffected areas. Disposal of waste should be performed in accordance with local, municipal, provincial, and/or federal jurisdictions having authority.
Mould	Pipe insulation canvas on the pipes in the CHP Distribution Tunnel leading to Sir John Carling Building showed suspected mould growth.	If these pipes are to be disturbed by workers during the CHP Decommissioning project, workers should be notified of the presence of this suspect mould and appropriate Personal Protective Equipment (PPE) (e.g. respiratory and dermal protection) may be required (Refer to CCA 82-2004).

Note 1: This schedule only summarizes suspected and confirmed asbestos-containing materials and other designated substances and hazardous materials. Please refer to the below referenced reports for additional information. All contractors are to verify as-built conditions, quantities, and locations on site.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Comply with requirements of this Section when performing following work:

.1 Removal of asbestos-containing white caulking on exterior copper flashing at building entrance.

.2 Removal of asbestos-containing drain pipe joint caulking at cleanout in ground floor garage and/or where present.

.3 Installing or removing non-friable asbestos-containing transite panel, transite ceiling tile remnant, Light heat shielding, Mechanical ventilation dampeners, Gasket material on soot (”heavies”) collectors, and select boiler hatches, Metal fire doors with concealed “aircell” insulation core, or other non-friable asbestos-containing material, other than ceiling tiles, if the material is installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.

.4 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating above noted and other non-friable asbestos-containing material if,

.1 the material is wetted to control the spread of dust or fibres, and

.2 the work is done only by means of non-powered hand-held tools.

.5 Cut, shape, grind, drill, scrape or abrade materials mentioned above using hand powered tools.

.2 Refer to the Specification Section 01 14 25 – Designated Substance Report for details on asbestos-containing materials.

1.2 RELATED REQUIREMENTS

.1 Section 01 14 25 – Designated Substance Report.

.2 Section 01 35 29.06 - Health and Safety Requirements.

.3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal

.4 Section 02 82 00.02 – Asbestos Abatement: Intermediate Precautions.

.5 Section 02 82 00.03 – Asbestos Abatement: Maximum precautions.

.6 Section 02 62 00.01 – Hazardous Materials.

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 O.Reg. 347 – General Waste Management, as amended

.4 Ontario Ministry of Labour (MoL).

.1 Occupational Health and Safety Act, R.S.O 1990, c. O1 (OHSA)

.1 O.Reg. 278/05 – Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, as amended.

.5 Public Works and Government Services Canada, Departmental Policy 057 - Asbestos.

1.4 DEFINITIONS

.1 HEPA vacuum: 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: water with non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.

.3 Asbestos-Containing Materials (ACMs): materials that contain 0.5 percent or more asbestos by dry weight, identified under Existing Conditions including fallen materials and settled dust.

.4 Asbestos Work Area: area where work takes place which will, or may, disturb ACMs.

.5 Authorized Visitors: Departmental Representative, and representative(s) of regulatory agencies.

.6 Competent worker: 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 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: 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: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.9 Occupied Area: any area of the building or work site that is outside Asbestos Work Area.

.10 Polyethylene: 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.

.11 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Sprayer must have appropriate capacity for work.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 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.

.3 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.

.4 Submit proof of Contractor's Asbestos Liability Insurance.

.5 Submit to the Departmental Representative necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.

.6 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.

.7 Submit proof satisfactory to Departmental Representative that employees have appropriate respirator fitting and testing. Workers must be fit-tested (qualitative as a minimum) with respirator that is personally issued.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial/Territorial, 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 Perform construction occupational health and safety in accordance with Section 01 35 29.14 - Health and Safety Requirements.

.2 Safety Requirements: worker protection.

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

.1 Air purifying half-mask 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 shall 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.

.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 shall be provided within or close to the Asbestos Work Area.

.5 Ensure workers wash hands and face when leaving Asbestos Work Area.

.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 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 reuse, and 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 licensed landfill for burial.

1.8 EXISTING CONDITIONS

.1 Cast Iron Drain Pipe Bell Joint Caulking at cleanout in ground floor garage contains 40% Chrysotile Asbestos.

.2 Transite panel contains 20% Chrysotile Asbestos.

.3 Transite ceiling tile remnants on concealed ceiling tracking in ceiling space of Ground Floor Kitchen and Front Office are assumed to contain asbestos.

.4 Light heat shielding in the ground floor storage room off garage is assumed to contain asbestos.

.5 Mechanical ventilation dampeners on the basement and 5th floor are assumed to contain asbestos.

.6 Gasket material on soot (”heavies”) collectors, and select boiler hatches are assumed to contain asbestos.

.7 White exterior caulking at copper flashing at building entrance contains 5% Chrysotile Asbestos.

.8 Metal fire doors on the ground floor have an “aircell” insulation core which is assumed to contain asbestos.

.9 Reports and information pertaining to material containing Chrysotile asbestos to be handled, removed, or otherwise disturbed and disposed of during this Project are bound into this specification, Section 01 14 25 – Designated Substance Report.

.10 Notify Departmental Representative of asbestos-containing 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.

1.9 SCHEDULING

.1 Hours of Work: perform work involving asbestos abatement located at the Building during hours specified by Departmental Representative. Include in Contract Sum additional costs to perform any work required outside of normal working hours.

1.10 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.

.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 reinforced fabric bonded both sides with polyethylene.

.2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.

.3 Waste Containers: 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.

.3 Labelling requirements: affix pre-printed cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.

.4 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.

.5 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

Part 3 Execution

3.1 PROCEDURES

.1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.2 Before beginning Work, isolate Asbestos Work Area using, minimum, pre-printed 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.

.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 Asbestos Work Area where dust and contamination cannot otherwise be safely contained.

.4 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.

.4 Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.

.5 Clean-Up:

.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; wet and fold these items to contain dust, then place in plastic bags.

.3 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.

.4 Seal waste bags and remove 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 Work areas and adjacent areas affected by Work using HEPA vacuum.

3.2 INSPECTION

.1 Perform inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviation(s) from these requirements that have not been approved in writing by Departmental Representative may result in Work stoppage, at no cost to Departmental Representative.

.2 Departmental Representative may inspect Work at any time during the project 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.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Comply with requirements of this Section when performing following Work:

.1 Glovebag and removal of good condition friable asbestos-containing insulation from piping (e.g. Aircell, layered cardboard wrap).

.2 Glovebag and removal of good condition friable asbestos-containing grey cement compound insulation from pipe fittings/elbows.

.3 The 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 a building.

.2 Refer to the Specification Section 01 14 25 – Designated Substance Report for details on asbestos-containing materials.

1.2 RELATED SREQUIREMENTS

.1 Section 01 14 25 – Designated Substance Report.

.2 Section 01 35 29.06 - Health and Safety Requirements.

.3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal

.4 Section 02 82 00.01 – Asbestos Abatement: Minimum Precautions.

.5 Section 02 82 00.03 – Asbestos Abatement: Maximum precautions.

.6 Section 02 62 00.01 – Hazardous Materials.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.205-94, Sealer for Application of Asbestos-Fibre Releasing Materials.

.2 Department of Justice Canada (Jus).

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.4 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.5 Underwriters' Laboratories of Canada (ULC).

.6 O.Reg. 347 – General Waste Management, as amended

.7 Ontario Ministry of Labour (MoL).

.1 Occupational Health and Safety Act, R.S.O 1990, c. O1 (OSHA)

.1 O.Reg. 278/05 – Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, as amended

.8 Public Works and Government Services Canada, Departmental Policy 057 - Asbestos.

1.4 DEFINITIONS

.1 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.

.2 Asbestos-Containing Materials (ACMs): materials that contain 0.5 percent or more asbestos by dry weight, identified under Existing Conditions Article, including fallen materials and settled dust.

.3 Asbestos Work Area: area where work takes place which will, or may disturb ACMs.

.4 Authorized Visitors: Departmental Representative, and representative(s) of regulatory agencies.

.5 Competent worker: 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 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.

.6 Friable Material: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.

.7 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.

.5 Must incorporate internal closure strip if it is to be moved or used in more than one specific location.

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

.9 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.10 Occupied Area: any area of building or work site that is outside Asbestos Work Area.

.11 Polyethylene: 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: 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 ACTION AND INFORMATION SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 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.

.3 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.

.4 Submit proof of Contractor's Asbestos Liability Insurance.

.5 Submit to the Departmental Representative necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.

.6 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.

.7 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 workers.

.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:

.1 encapsulants;

.2 amended water;

.3 slow-drying sealer.

.10 Submit proof satisfactory to Departmental Representative that employees have appropriate respirator fitting and testing. Workers must be fit-tested (qualitative as a minimum for Half-face respirator, quantitative for Full-face respirator) with respirator that is personally issued.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial/Territorial 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 Do construction occupational health and safety in accordance with Section 01 35 29.14 - Health and Safety Requirements for Contaminated Sites.

.2 Safety Requirements: worker and visitor protection.

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

.1 Air purifying half-mask 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.

.1 Full-face respirator required for work described in Part 1, Section 1.1.1.7 when material is not wetted.

.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 shall 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.

.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.

.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.

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

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 reuse, and 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 licensed landfill for burial.

1.8 EXISTING CONDITIONS

.1 Materials as described in Section 1.9 of Section 02 82 00.01 – Asbestos Abatement: Minimum Precautions.

.2 Minor debris on top of the ceiling slab of the Steam Tunnel entrance in the Basement is suspected to consist of asbestos-containing pipe fitting insulation.

.3 Metal clad cap insulation on a header in the Basement contains 20% Chrysotile asbestos.

.4 An end cap insulation on the High Temperature Hot Water pipe run contains 60% Chrysotile asbestos.

.5 Grey pipe elbow insulation on domestic water pipes contains 60% Chrysotile asbestos.

.6 Select pipe elbow insulation (painted red) contains 50% Chrysotile asbestos.

.7 Layered Cardboard Wrap (antisweat) insulation on domestic water pipes and drain pipes contains 3 - 40% Chrysotile asbestos.

.8 Grey parging insulation over white non-asbestos insulation on Emergency Generator Pipe elbows and hangers contains 0.71% Chrysotile asbestos.

.9 Insulation on middle section of induced fan units contains contains 5% Chrysotile and 1% Amosite asbestos.

.10 Much of the pipe insulation in the Basement is non-asbestos (e.g. fiberglass, non-asbestos white insulation, etc.). However, pipe fitting insulation type was inconsistent and varied between asbestos and non-asbestos applications, and in some cases both applications present on the same fitting.

Consider all pipe fitting insulation as asbestos-containing for abatement purposes.

.11 Asbestos-containing grey parging insulation over white non-asbestos insulation was noted on Emergency Generator Pipe elbows and hangers in the Ground Floor Diesel Room. Asbestos precautions must be used when disturbing materials at these locations.

.12 Reports and information pertaining to material containing chrysotile and amosite asbestos to be handled, removed, or otherwise disturbed and disposed of during this Project are bound into this specification, Section 01 14 25 – Designated Substance Report.

.13 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 SCHEDULING

.1 Hours of Work: perform work involving asbestos abatement located at the Building during hours specified by Departmental Representative. Include in Contract Sum additional costs to perform any work required outside of normal working hours.

1.10 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, at minimum:

.1 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.

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: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in concentration to provide thorough wetting of asbestos-containing material.

.3 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.

.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:

.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: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.

.6 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.

.1 Sealer: flame spread and smoke developed rating less than 50 and be compatible with new fireproofing.

.7 Encapsulant: penetrating type conforming to CAN/CGSB-1.205.

Part 3 Execution

3.1 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.

3.2 PROCEDURES

.1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements for Contaminated Sites.

.2 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)'.

.3 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.

.4 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 walls containing drywall joint compound, and when removing asbestos containing material from piping or equipment and the "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.

.5 Before removing non-asbestos suspended ceilings, remove any applicable asbestos-containing dust and/or debirs on upper surfaces using HEPA vacuum equipment.

.1 Remove and clean surfaces of ceiling panels using HEPA vacuum prior to removal and appropriate disposal/recycling.

.6 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.

.7 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.

.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.

.8 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 at no additional costs to Departmental Representative.

.9 Clean-up:

.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.

3.3 AIR MONITORING

.1 All areas outside of asbestos work areas, from beginning of work until completion of cleaning operations are subject to air monitoring by Departmental Representative in accordance with PWGSC requirements.

.1 Contractor shall be responsible for ensuring fibre concentrations within the enclosure does not exceed worker exposure limits in accordance with applicable Provincial Occupational Health and Safety regulations.

.2 If air monitoring shows that areas outside of asbestos work area are contaminated, enclose, maintain and clean these areas in same manner as that applicable to Asbestos Work Areas.

.1 Stop work and clean areas outside of Asbestos Work Areas when PCM measurements exceed 0.05 f/cc and correct procedures.

.2 Re-clean Asbestos Work Areas when PCM measurements exceed 0.05 f/cc upon completion of work.

.3 All required cleaning, re-cleaning, additional air testing and/or inspections will be at no extra charge to Departmental Representative.

.3 Ensure that respiratory safety factors are not exceeded.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Comply with requirements of this Section when performing following work:

.1 Removal or disturbance of more than one square metre of friable asbestos-containing piping insulation (e.g. Aircell, layered cardboard wrap).

.2 Removal or disturbance of more than one square metre of friable asbestos-containing duct insulation (e.g. asbestos-containing induction fan insulation).

.3 Removal or disturbance of more than one square metre of friable asbestos-containing grey cement compound from pipe fittings/elbows, where the glove bag method is not used;

.4 Removal or disturbance of more than one square metre of friable asbestos-containing material during the repair, alteration, maintenance or demolition of all or part of a building.

.5 Repairing, altering or demolishing all or part of boilers or similar structures that are made in part of refractory materials that are asbestos-containing materials.

.2 Refer to the Specification Section 01 14 25 – Designated Substance Report for details on asbestos containing materials.

1.2 RELATED REQUIREMENTS

.1 Section 01 14 25 – Designated Substance Report.

.2 Section 01 35 29.06 - Health and Safety Requirements.

.3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.4 Section 02 82 00.01 – Asbestos Abatement: Minimum Precautions.

.5 Section 02 82 00.02 – Asbestos Abatement: Intermediate Precautions.

.6 Section 02 62 00.01 – Hazardous Materials.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.205-03, Sealer for Application to Asbestos-Fibre-Releasing Materials.

.2 Canadian Standards Association (CSA International).

.3 Department of Justice Canada.

.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 O.Reg. 347 – General Waste Management, as amended

.7 Underwriters' Laboratories of Canada (ULC).

.8 Ontario Ministry of Labour (MoL).

.1 Occupational Health and Safety Act, R.S.O 1990, c. O1 (OSHA)

.1 O.Reg. 278/05 – Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, as amended

.9 Public Works and Government Services Canada, Departmental Policy 057 - Asbestos.

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 percent or more asbestos by dry weight, identified under Existing Conditions Article, including fallen materials and settled dust.

.4 Asbestos Work Area: Area where actual removal and sealing and enclosure of spray or trowel-applied asbestos-containing materials takes place.

.5 Authorized Visitors: Departmental Representative, and representative(s) of regulatory agencies.

.6 Competent worker: 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 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 Material: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.

.10 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.

.11 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.

.12 Non-Friable Materials: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.13 Occupied Area: any area of building or work site that is outside Asbestos Work Area.

.14 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.

.15 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 ACTION AND INFORMATION 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 employees have had instruction on hazards of asbestos exposure, respirator use, dress, use of showers, entry and exit from work areas, and aspects of work procedures and protective measures. 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.

.3 Submit layout of proposed enclosures and decontamination facilities to Departmental Representative for review.

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

.5 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.

.6 Submit proof of Contractor's Asbestos Liability Insurance.

.7 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit-tested (quantitative) 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/Territorial 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 29.14 - Health and Safety Requirements for Contaminated Sites.

.2 Safety Requirements: worker and visitor protection.

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

.1 Full-facepiece respirator equipped with HEPA (P-100) filter cartridges, personally issued to worker and marked as to efficiency and purpose, and acceptable to Authority having jurisdiction as suitable for type of asbestos and level of asbestos exposure in Asbestos Work Area. If disposable type filters are used, provide sufficient filters so that 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 penetration of asbestos fibres, consisting of full-body covering including head covering with snug-fitting cuffs at wrists, ankles, and neck.

.2 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 worksuits 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.

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

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

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

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

.7 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 reuse, and 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 licensed landfill for burial.

1.8 EXISTING CONDITIONS

.1 Materials as described in Section 1.9 of Section 02 82 00.01 – Asbestos Abatement: Minimum Precautions.

.2 Materials as described in Section 1.8 of Section 02 82 00.02 – Asbestos Abatement: Intermediate Precautions.

.3 Grey/beige parging insulation on the floor and sides of the Return Header of Boiler #1 contains 1% Chrysotile Asbestos. This material is also suspected present in the same areas of Boiler # 2 & 3.

.4 Grey/beige castable parging insulation in the Fire Box side wall of Boiler #1 contains 9.79% Chrysotile Asbestos. This material was not seen in the same areas of Boiler # 2 & 3.

.5 Parging insulation on the upper side walls of Boiler #1, #2 & #3 contains 1% Tremolite, 1 % Chrysotile Asbestos.

.6 Brown insulation concealed beneath the floor of Boiler #1 contains 40% Amosite. This material is also suspected present concealed beneath the floors of Boiler # 2 & 3.

.7 It was reported that boiler materials were removed and replaced with other material as part of boiler fit-ups over the years. These fit-ups are not well documented. The Boiler sampling program indicates that older asbestos-containing materials are indeed present at the boiler base and concealed beneath the boiler floors while firebox materials did not contain asbestos with the exception of Castable material noted at the Boiler #1, Fire Box Side Wall. Asbestos-containing Side Wall parging was then noted at the upper level of all three boilers. Given the inconsistencies between boiler material sampling results, treat all boiler materials as asbestos-containing for abatement purposes.

.8 Reports and information pertaining to material containing chrysotile, amosite and tremolite asbestos to be handled, removed, or otherwise disturbed and disposed of during this Project are bound into this specification, Section 01 14 25 – Designated Substance Report.

.9 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 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/Territorial, Department of Labour.

.4 Disposal Authority.

.2 Inform sub-trades of presence of friable 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 asbestos abatement located at the Building during hours specified by Departmental Representative. Include in Contract Sum additional costs to perform any work required outside of normal working hours.

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.

.4 Limitations of equipment.

.3 Instruction and training must be provided by competent, qualified person.

.4 Every worker involved in a Type 3 operation must have successfully completed the Asbestos Abatement Worker Training Program approved by the Ministry of Training, Colleges and Universities.

.5 Every supervisor of a worker involved in a Type 3 operation must have successfully completed the Asbestos Abatement Supervisor Training Program approved by the Ministry of Training, Colleges and Universities.

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 mixed with water in concentration to provide adequate penetration and wetting of asbestos-containing material.

.5 Asbestos waste containers: Metal or fibre - type acceptable to dump operator with tightly fitting covers and 0.15 mm minimum thickness sealable polyethylene liners.

.1 Label containers in accordance with applicable Regulations. Label in both official languages.

.6 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.

.1 Sealer: flame spread and smoke developed rating less than 50 and be compatible with new fireproofing.

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 area using HEPA vacuum and remove from work area to an appropriate temporary location.

.3 Preclean fixed casework, plant, and equipment within proposed work area(s), using HEPA vacuum and cover with polyethylene sheeting sealed with tape.

.4 Clean proposed work area(s) 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 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.

.6 Seal off openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.

.7 Cover floor and wall surfaces with polyethylene sheeting sealed with tape. Use one layer 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.

.8 Build airlocks at entrances to and exits from work area(s) so that work area(s) are always closed off by one curtained doorway when workers enter or exit.

.9 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)".

.10 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.

.11 Maintain emergency and fire exits from work area(s), or establish alternative exits satisfactory to Fire Commissioner of Canada.

.12 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.

.13 After preparation of work area(s) and Decontamination Enclosure Systems remove plaster ceilings, including lath, furring, channels, hangers, wires, clips, and dispose of as contaminated waste in specified containers. Spray ceiling 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 area(s), with two curtained doorways, one to Shower Room and one to work area(s). Install portable toilet, waste receptor, and storage facilities for workers' shoes and protective clothing to be reworn in work area(s). 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. 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 one layer 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 polyethyene 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 area(s) 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 After wire brushing and/or wet sponging to remove visible asbestos, wet clean and/or HEPA vacuum entire work area including Equipment and Access Room, and equipment used in process. After inspection by project Departmental Representative apply continuous coat of slow-drying sealer to surfaces of work area. Allow at least 18 hours with no entry, activity, ventilation, or disturbance other than operation of negative pressure units during this period. Negative pressure units are to remain in place and operational until acceptable clearance air sampling results are obtained by Departmental Representative.

3.4 FINAL CLEANUP

.1 Following cleaning specified in 3.3.5 above, and when air sampling by Departmental Representative, specified in section 3.6.4, shows that asbestos levels inside work area enclosure(s) do not exceed 0.01 fibres/cc (as determined by membrane filter method at 400-500X magnification phase contrast illumination, as described in NIOSH 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. 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, Departmental Representative will collect air samples on daily basis outside of work area enclosure(s) in accordance with industry standard practice and PWGSC DP-057.

.1 Contractor shall be responsible for monitoring inside in accordance with applicable Provincial/Territorial Occupational Health and Safety Regulations.

.2 Contractor shall ensure that respiratory safety factors for Workers are not exceeded.

.2 If air monitoring shows areas outside of work area are contaminated, enclose, maintain and clean these areas in same manner as that applicable to Asbestos Work Areas.

.1 Stop work and clean areas outside of Asbestos Work Areas when PCM measurements exceed 0.05 f/cc and correct procedures.

.2 All required cleaning, re-cleaning, additional air testing and/or inspections will be at no extra charge to Departmental Representative.

.3 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, Departmental Representative will perform air monitoring within Asbestos Work Area.

.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.

.4 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.7 INSPECTION

.1 Perform inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviation(s) from these requirements that have not been approved in writing by Departmental Representative may result in Work stoppage, at no cost to Departmental Representative.

.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.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Lead abatement procedures for the removal/disturbance/repair of lead-containing paint(s) and other lead-containing surface coating materials on various building components, if required to accommodate the project scope of work.

.2 Any other work that disturbs lead-containing materials and materials suspected of containing lead, including the following: solder on copper pipes, emergency light batteries, and cast iron drainpipe caulking.

.3 Refer to Specification Section 01 14 25 – Designated Substance Report for details on lead-containing materials.

1.2 RELATED REQUIREMENTS

.1 Section 01 14 25 – Designated Substance Report.

.2 Section 01 35 29.06 - Health and Safety Requirements.

.3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.4 Section 02 82 00.01 – Asbestos Abatement: Minimum Precautions.

.5 Section 02 82 00.02 – Asbestos Abatement: Intermediate Precautions.

.6 Section 02 82 00.03 – Asbestos Abatement: Maximum Precautions.

.7 Section 02 62 00.01 – Hazardous Materials.

1.3 REFERENCES

.1 Department of Justice Canada.

.1 Canadian Environmental Protection Act (CEPA), 1999.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.3 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.4 Ontario Ministry of Environment (MoE).

.1 R.R.O. 1990, Reg. 347, General – Waste Management, as amended.

.5 Ontario Ministry of Labour (MoL).

.1 Occupational Health and Safety Act, R.S.O. 1990, c. O.1 (OHSA).

.1 O.Reg. 213/91, Construction Projects.

.2 R.R.O. 1990, Regulation 490/09, Designated Substances, as amended.

.2 Guideline: Lead on Construction Projects, September 2004 as revised.

.6 Federal Canada Consumer Product Safety Act's Surface Coating Materials Regulations SOR/2005-109, as amended

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 unless Site Conditions dictate otherwise.

.2 Authorized Visitors: Departmental Representatives or designated representatives, and representatives of regulatory agencies.

.3 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed by placing two overlapping sheets of polyethylene over 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. Reinforce free edges of polyethylene with duct tape and weight bottom edge to ensure proper closing. Overlap each polyethylene sheet at openings not less than 1.5 m on each side unless Site Conditions dictate otherwise.

.4 Lead-Containing Paint: Paint that contains lead in concentrations (typically greater than 90 parts per million (ppm)) that may result in elevated airborne lead exposure during operations that disturb the paint,

.5 Occupied Area: any area of building or work site that is outside the Lead Work Area.

1.5 ACTION AND INFORMATION SUBMITTALS

.1 One (1) week prior to the start of abatement work, submit proposed methodology for abatement procedures for review by Departmental Representative. The proposed methodology shall include:

- .1 Products to be used complete with MSDS information.
- .2 List of protective equipment to be used by workers.
- .3 Plan identifying area(s) of work for abatement procedures.
- .4 Requirements for engineering controls, ventilation, etc.
- .5 Requirements for access to and egress from the Lead Work Area.
- .6 A written Health and Safety Plan specific to work of this Section. As a minimum this document must include:
  - .1 Classification of all lead abatement work in accordance with the criteria used in the document Guideline: Lead on Construction Projects issued by the Ontario Ministry of Labour.
  - .2 The identity of the “competent person” who will, on behalf of the Contractor, perform regular inspections of the lead abatement activities to prevent dangerous, unhealthy or unsafe conditions. The “competent person” must be on site at all times while lead abatement activities are in progress.
  - .3 A description of the equipment and materials, controls, crew size, job responsibilities, and operations and maintenance procedures for each activity involved in the work of this Section.
  - .4 A description of the specific control methods to be used in the lead-containing material abatement process.

.5 A strategy to ensure that personnel are not exposed to airborne lead or other contaminants in concentrations that exceed the current Time Weighted Average Exposure Value (TWAEV).

.6 A description of the medical surveillance program in place for lead abatement workers.

.7 Names of products to be used in lead abatement work.

.2 Before beginning work:

.1 Submit proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead exposure, respirator use, dress, use of showers, entry and exit from work areas, and aspects of work procedures and protective measures.

.2 Submit proof in the form of a certificate that supervisory personnel have attended a lead-containing material abatement course, of not less than 1-day duration.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to lead, provided that in case of conflict among those requirements or with this specification, the more stringent requirements apply. Comply with regulations in effect at time work is performed.

.2 Health and Safety:

.1 Safety Requirements: worker and visitor protection.

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

.2 Washing facilities consisting of a wash basin, water, soap and towels shall be provided by the Contractor. All workers shall use these washing facilities before eating, drinking, smoking or leaving the work site. Washing facility areas are to be designated by Departmental Representative

.3 Protective equipment and clothing to be worn by workers while in the Lead Work Area includes:

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

.2 Respirator, personally issued to worker and marked as to efficiency and purpose, and acceptable to Authority having jurisdiction as suitable for level of lead exposure in the Lead Work Area. If disposable type filters are used, provide sufficient filters so that workers can install new filters following disposal of used filters and before re-entering contaminated areas.

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

.5 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 the Lead Work Area.

1.7 WASTE MANAGEMENT AND DISPOSAL

.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 Disposal of lead waste, including wash and rinse water, generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Label containers with appropriate warning labels.

.4 Provide manifests describing and listing waste created. Transport containers by approved means to licensed facility for disposal.

1.8 EXISTING CONDITIONS

.1 Lead has been confirmed to be present in concentrations that may result in a health risk during demolition activities. Select representative samples of materials with lead-containing surfacing materials have confirmed that materials are non-hazardous for disposal. Reports and information pertaining to lead-containing materials to be handled, removed, or otherwise disturbed and disposed of during this Project are available for inspection at the office of the Departmental Representative.

Part 2 Products

2.1 MATERIALS

.1 All materials brought to project site must be in good condition and free of lead dust. Disposable items must be of new materials only.

.2 Lead Cleaning Agent: A cleaning agent suitable for lead dust. Acceptable products:

.1 Detergents with a high phosphate content (containing at least 5% trisodium phosphate).

.2 Phosphate-free lead dissolving agent.

.3 FR polyethylene: minimum 0.15 mm thick, woven fibre reinforced fabric bonded both sides with polyethylene.

.4 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions.

2.2 EQUIPMENT

.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 Sprayer: Garden reservoir type, low velocity, capable of producing a mist or fine spray.

Part 3 Execution

3.1 PREPARATION

.1 Implement lead precautionary measures appropriate to the work completed in accordance with MOL Guideline: Lead on Construction Projects, September 2004 as revised.

.2 Type 1 Work Areas:

.1 Install polyethylene drop sheets below lead operations which produce or may produce dust, chips, or debris containing lead.

.3 Type 2 Work Areas:

.1 Install polyethylene drop sheets below lead operations which produce or may produce dust, chips, or debris containing lead.

.2 Post signs in sufficient numbers to warn of the lead hazard. There shall be a sign, at least, at each entrance to the Lead Work Area. The signs shall display the following information in large, clearly visible letters using both official languages:

.1 Lead dust, fume or mist hazard.

.2 Access to the work area is restricted to authorized persons.

.3 Respirators must be worn in the work area.

.4 Type 3 Work Areas:

.1 Post signs in sufficient numbers to warn of the lead hazard. There shall be a sign, at least, at each entrance to the Lead Work Area. The signs shall display the following information in large, clearly visible letters using both official languages:

.1 Lead dust, fume or mist hazard.

.2 Access to the work area is restricted to authorized persons.

.3 Respirators must be worn in the work area.

.2 Barriers, Partial Enclosures and Full Enclosures: Barriers, partial enclosures, and full enclosures shall be constructed to separate the Lead Work Area from the rest of the project. Barriers shall only be used where full and partial enclosures are not practical.

.1 Barriers:

.1 Ropes or barriers do not prevent the release of contaminated dust or other contaminants into the environment. However, they can be used to restrict access of workers who are not adequately protected with proper PPE, and also prevent the entry of workers not directly involved in the operation. Ropes or barriers shall be placed at a distance far enough from the operation that allows the lead-containing dust to settle. If this is not achievable, warning signs should be posted at the distance where the lead-containing dust settles to warn that access is restricted to persons wearing PPE.

.2 Partial Enclosures:

.1 Partial enclosures allow some emissions to the atmosphere outside of the enclosure. Partial enclosures

may consist of vertical tarps and floor tarps so long as the tarps are overlapped and securely fixed together at the seams. A partial enclosure is not a suitable containment system if significant dust is being generated.

.3 Full Enclosures:

.1 Full enclosures are tight enclosures (with tarps that are generally impermeable and fully sealed joints and entryways). Full enclosures allow minimal or no fugitive emissions to reach the environment outside of the Lead Work Area. For full enclosures, the following requirements shall be met:

.1 The enclosure shall be constructed of windproof materials that are impermeable to dust.

.2 The enclosure shall be supported by a secure structure.

.3 All joints in the enclosure shall be fully sealed.

.4 Entrances to the enclosure shall be equipped with air locks.

.5 The escape of abrasive and debris from the enclosure shall be controlled, at air supply points, by the use of baffles, louvers, flap seals and filters.

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

.1 Construct Worker Decontamination Enclosure System as close to the work area as possible in area specified by Departmental Representative. Submit layout of proposed enclosures and decontamination facilities including location to Departmental Representative for review.

.2 Equipment and Access Room: build an Equipment and Access Room between Shower Room and Lead Work Area, with two curtained doorways, one to Shower Room and one to Lead Work Area. Install a waste receptor and storage facilities for workers' shoes and protective clothing to be reworn in Lead Work Area. Build and 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.

.3 Shower Room: build a 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 or fewer workers. Provide constant supply of hot and cold, or warm (between 40°C and 50°C) potable water. Provide piping and connect to water sources and drains. Provide soap, clean towels, and appropriate containers for disposal of used respirator filters.

.4 Clean Room: build a 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 a mirror to permit workers to fit respiratory equipment properly.

.4 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.

.5 Do not begin lead abatement work until:

.1 Arrangements have been made for disposal of hazardous waste, as applicable.

.2 Arrangements have been made for containing, filtering, testing and disposal of waste water.

.3 Work areas, decontamination enclosures and parts of project site 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.

.8 Departmental Representative has reviewed preparatory work and provided written approval for lead abatement work to proceed.

3.2 SUPERVISION

.1 Minimum of one Supervisor for every ten or fewer workers is required.

.2 Approved Supervisor must remain within Lead Work Area during disturbance, removal, or other handling of lead-containing paint and other lead contaminated materials.

3.3 LEAD REMOVAL

.1 The removal or disturbance of asbestos-containing materials coated/covered with lead-containing coatings/materials must also be performed using appropriate asbestos precautions as outlined in the relevant Sections.

.1 Section 02 82 00.01 – Asbestos Abatement, Minimum Precautions.

.2 Section 02 82 00.02 – Asbestos Abatement, Intermediate Precautions.

.2 Where lead-paint removal is required, before removing lead-containing paint, lead-containing surface coatings, or disturbing other lead contaminated materials:

.1 Prepare site.

.2 Spray surfaces to be disturbed, unless wetting creates a hazard, that are finished with lead-containing coatings, with water using airless spray equipment capable of providing a “mist” application to prevent the release of dust.

.3 Prohibited methods of lead-containing surface coating removal include:

.1 Dry scraping.

.2 Open flame burning, torching, fossil fuel-powered heat plates, welding, cutting torches, and heat guns operating at temperatures greater than 590°C.

.3 Machine grinding or sanding without a HEPA-filtered exhaust tool.

.4 Hydroblasting or high-pressure water wash.

.5 Abrasive blasting or sandblasting.

.6 Chemical paint removers containing methylene chloride.

.4 Methods of lead-material material removal that may be used, pending approval from the Departmental Representative, include:

.1 Electric-powered flameless heat guns that operate at temperatures less than 230°C followed by manual scraping with round edge scrapers.

.2 Mechanical removal methods such as HEPA sanding and wet scraping.

.3 Chemical removal methods that use non-caustic strippers.

.4 Other method(s) at the sole discretion of the Departmental Representative.

.5 Test Area Mock-ups:

.1 Prepare a test area as directed by the Departmental Representative, not less than 0.3m² in surface area, for each type of substrate that requires lead-containing surface coating removal.

.2 Remove the paint from each test area using a method listed in Item 3.3.4. above to allow the Departmental Representative to evaluate the effectiveness of the method on that particular substrate.

.3 Once a test area mock-up has been approved by the Departmental Representative, this will represent the standard of acceptance for that type of substrate.

.6 Exterior lead-containing green painted wooden doors must be packaged and disposed of as Hazardous Waste with respect to lead.

.1 Handle lead-containing green painted wooden doors in such a manner so as to prohibit generation and/or ingestion of lead dust.

.7 Lead-containing emergency light batteries must be disposed of appropriately and recycled where possible.

.1 Handle lead-containing batteries in such a manner so as to prohibit generation and/or ingestion of lead dust.

.8 Use appropriate lead precautions when handling bell joints containing lead caulking.

.1 Handle bell joints in such a manner so as to prohibit generation and/or ingestion of lead dust.

.9 Use appropriate lead precautions when handling lead-containing solder on piping.

.1 Handle lead-containing solder on piping in such a manner so as to prohibit generation and/or ingestion of lead dust.

.10 At completion of lead-containing surface coating removal (if required), perform the following clean-up:

.1 Wait at least 1-hour after active lead abatement work has ceased to allow airborne lead particles to settle.

.2 HEPA vacuum all surfaces within the Lead Work Area. Start vacuuming at the highest levels furthest from the Decontamination Facilities and work progressively downwards towards the Decontamination Facilities.

.3 Wash all surfaces with Lead Cleaning Agent and rinse with clean water. Start washing and rinsing at the highest levels furthest from the Decontamination Facilities and work progressively downwards towards the Decontamination Facilities.

.4 Repeat HEPA vacuuming, washing and rinsing as required to achieve clearance criteria.

3.4 FINAL CLEANUP

.1 Following cleaning specified in Item 3.3.10 above, and, if required by Departmental Representative, when the Lead Work Area has met the air monitoring and residual lead dust levels specified in Item 3.5, as well as inspection criteria specified in Item 3.6 proceed with final cleanup.

.2 Remove polyethylene sheet by rolling it towards the centre of the Lead Work Area. Immediately vacuum any visible paint chips, particles, dust and debris observed during cleanup using HEPA vacuum equipment.

.3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in sealed labelled waste containers for transport.

.4 Include in clean-up Work areas, Equipment and Access Room, Shower Room, and other contaminated enclosures.

.5 Include in clean-up sealed waste containers and equipment used in Work and remove from work areas, at appropriate time in cleaning sequence.

.6 A final check may be carried out to ensure that no lead dust or debris remains on surfaces as a result of dismantling operations.

3.5 AIR MONITORING AND SURFACE WIPE SAMPLING

.1 From beginning of Work until completion of cleaning operations, the Departmental Representative may be on site to collect air samples either inside or outside of the Lead Work Area in accordance with standard methods for workplace air sampling and analysis.

.1 This air monitoring does not relieve the Contractor of any responsibility for air monitoring inside the Lead Work Area to verify that the respiratory protection in use provides a suitable protection factor.

.2 Use results of air monitoring inside the Lead 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 airborne lead concentrations are above the protection factor of respirators in use, the Contractor shall:

.1 Stop abatement.

.2 Introduce more stringent engineering controls.

.3 Use a higher protection factor in respiratory protection for persons inside the Lead Work Area.

.2 If air monitoring shows that airborne lead concentrations outside the Lead Work Area exceed 0.025 mg/m³, the Contractor shall maintain and clean these areas, in same manner as applicable to the Lead Work Area, at no additional cost to the Client.

.3 Final clearance air monitoring will be performed at the sole discretion of the Departmental Representative.

.1 Final air monitoring results must show airborne lead levels less than 0.005 mg/m³.

.2 If air monitoring results show airborne lead levels in excess of 0.005 mg/m³, the Contractor shall re-clean the Lead Work Area.

.3 Repeat as necessary until airborne lead levels are less than 0.005 mg/m³.

.4 The following criteria shall be used to define an acceptable level of cleanliness after lead abatement activities:

.1 Where removal of paint coatings has been performed to accommodate the project scope of work:

.1 Visibly free of paint(s) and primers(s).

.2 Residual lead dust concentration less than:

.1 430 micrograms/square metre for interior floor surfaces

.2 2,691 micrograms/square metre for interior windowsills

.3 8,611 micrograms/square metre for exterior surfaces

3.6 INSPECTION

.1 Perform inspections of Lead Work Area to confirm compliance with specification and requirements of authorities having jurisdiction. Deviation from these requirements that have not been approved in writing by the Departmental Representative may result in Work stoppage, at no cost to Departmental Representative.

.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 a leakage of liquid, dust or fume from the Lead Work Area has occurred or is likely to occur the 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.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This section specifies requirements and procedures and materials required for the safe handling, management, storage, and disposal of polychlorinated biphenyl (PCB) material.

.2 PCBs are present in select fluorescent light ballasts associated with light fixtures located throughout the Building. Refer to Specification Section 01 14 25 – Designated Substance Report for further details regarding PCB-containing light fixture ballasts.

.3 Oil which contains PCBs is suspected present in one (1) oil-cooled transformer observed disconnected and on a wood skid along the exterior west side lot of the building, and in one (1) pad mounted oil-cooled transformer observed on the Southwest lawn adjacent to the building.

1.2 RELATED REQUIREMENTS

.1 Section 01 14 25 – Designated Substance Report.

.2 Section 01 35 29.06 - Health and Safety Requirements.

.3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.4 Section 02 62 00.01 – Hazardous Materials.

1.3 REFERENCES

.1 American Board of Industrial Hygiene (ABIH).

.2 Department of Justice Canada (Jus)/CEPA SOR/92-507-SOR/2000-102, Storage of PCB Material Regulations.

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.3 Environment Canada.

.1 *Identification of Lamp Ballasts Containing PCBs,* by Environment Canada EPS 2/CC/2 (revised), August 1991.

.2 Manual for Spills of Hazardous Materials - 1985.

.4 Ontario Environmental Protection Act, R.R.O 1990,

.1 General – Waste Management, O. Reg 347/09, as amended by O. Reg 337/09.

.2 Waste Management – PCB's, O. Reg 362, as amended by O. Reg 232/11.

.3 Mobile PCB Destruction Facilities, R.R.O. Regulation 352/90.

.5 Revised federal *PCB Regulations* (SOR/2008-273), September 2008.

.6 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.4 ACTION AND INFORMATIONAL 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.

1.5 CONTROL SUBMITTALS

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

.2 Record keeping: maintain and make available for review by 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.

1.6 QUALITY ASSURANCE

.1 Co-ordinate with Section 01 45 00 - Quality Control.

.2 Instruct personnel on dangers of PCB exposure, on respirator use, decontamination and applicable Federal, Provincial/Territorial 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 the building, site, buildings surrounding the site, and environment.

1.7 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.

1.8 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 Departmental Representative.

.2 Ensure personnel are familiar with and understand current PCB waste management procedures and use of personnel 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 licensed 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 (e.g., 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 Revised federal *PCB Regulations* (SOR/2008-273).

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 2.0 metres high, with lockable entrance.

.6 Smoking is not permitted within 15m of the 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.

.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 or closed-head double-bung steel drum.

.4 Paint or treat 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 and 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 and siding sealed with durable PCB-resistant coating.

.4 Floor Opening, Floor Drains and Sumps.

.1 Closed and sealed to prevent escape of liquid.

2.5 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/m^3.

.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/m^3 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.

2.6 WARNING SIGNS AND LABELS

.1 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 at least 150 x 150 mm, as approved by Departmental Representative in accordance with Manual of Spills of Hazardous Materials.

.2 Label containers of equipment, and drained containers containing chlorobiphenyls in concentration exceeding 1% with non-serialized, black and white, "ATTENTION PCB" label, measuring at least 150 x 150 mm, as approved by Departmental Representative in accordance with Manual of Spills of Hazardous Materials.

.3 Label containers of PCB material and drained containers of PCB material with chlorobyphenyl concentration exceeding 50 parts per million by weight with non-serialized, Warning Label for PCB-Contaminated Equipment as approved by Departmental Representative.

.4 Label doors to storage sites, fencing and other security barriers enclosing storage sites with non-serialized, black and white, "ATTENTION PCB" label, as approved by Departmental Representative in accordance with Manual of Spills of Hazardous Materials.

.5 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 29.14 - Health and Safety Requirements for Contaminated Sites.

.2 Store PCB waste materials in accordance with Revised federal *PCB Regulations* (SOR/2008-273).

.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/Territorial 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.

.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 TRANSORMERS

.1 Assume transformers mentioned in Part 1, Section 1.1.3 contain oil which contains regulated amounts of PCBs.

.1 Oil suspected of containing PCBs is subject to testing by Departmental Representative to verify PCB content.

.1 If analysis is performed on oil and the concentration is found to be less than 50 ppm, discuss appropriate disposal actions with departmental representative.

.2 Should the oil contain regulated amounts of, or is assumed to contain, PCBs the following applies.

.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 either retrofilling or on-line chemical treatment.
.2 PCB fluid concentration no greater than 50 ppm verified by 90-day test.
.2 Askarel transformers:
.1 Decontaminate by either series retrofilling, or 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 years at five year intervals.
.5 Porous materials:
.1 Considered PCB waste unless shown otherwise.
.2 Destroyed by methods approved for PCB waste.

.3 Recycling of Transformers:
.1 Dielectric fluid concentration.
.2 PCB fluid concentration no greater than 50 ppm verified by 90-day test in accordance with The PCB Waste Management Regulations O. Reg 232/11.

.2 Surface contamination:
.1 Solvent cleaned:
.1 10 ug/100 cm^2.
.2 Shredded and incinerated:
.1 Less than 0.5 ppm by weight.

.3 In all cases, transformer handling, PCB oil remediation, and transformer disposal methodology must be submitted to Departmental Representative for review and approval prior to remedial operations.

3.6 HANDLING PCB BALLASTS

.1 Handle light ballasts using protective gloves and coveralls appropriate for preventing dermal exposure to any leaking oil.

.2 Confirm PCB content of all light ballasts prior to disposal using *Identification of Lamp Ballasts Containing PCBs*, by Environment Canada EPS 2/CC/2 (revised), August 1991, or other appropriate references.

.1 If the PCB content of a ballast cannot be readily determined using appropriate references, assume that ballast contains PCBs and treat ballast as such.

.3 Sort/separate PCB-containing ballasts from non-PCB ballasts.

.4 Package and dispose of PCB ballasts and contaminated PPE accordingly.

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 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 Departmental 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 absorbents as approved by Departmental Representative.

.11 Wipe contaminated area with rags and kerosene, fuel oil or 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 chlorobyphenyl concentrations are above permissible exposure levels.

.2 Use when entering closed vessels.

.3 Use in emergency situations.

.5 Permissible exposure limit.

.1 0.05 milligram of PCBs per cubic metre of air, averaged over 8 hours.

.6 Fire protection.

.1 Wear totally encapsulated suit and self-contained breathing apparatus with full facepiece 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 chlorobyphenyl (54% chlorine) is handled, processed or stored.

.3 Wash hands thoroughly with soap or mild detergent and water after handling liquid chlorobyphenyl (54% chlorine).

3.9 TRANSPORTATION AND DISPOSAL

.1 Furnish labour, materials, and equipment necessary to store, transport, and dispose of PCB contaminated material in accordance with Federal, Provincial/Territorial and Municipal requirements.

.2 Prepare and maintain waste shipment records and manifests as required.

.3 Transport PCB contaminated-equipment in approved containers with removable heads in accordance with TDGA.

.4 Store liquid PCBs in Specification approved containers in accordance with TDGA.

.5 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.

.6 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.

.7 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.

.8 Reports.

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

3.10 FIELD QUALITY CONTROL

.1 Owners or Operators of Construction/Storage Sites.

.1 All PCB remedial work is subject to evaluation by departmental representative.

.2 At request of departmental representative, measure concentration of PCBs in accordance with CEPA SOR/92-507 - Storage of PCB Material Regulations.

.3 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.

.4 Immediately repair or replace drum, container or equipment found to be leaking PCBs.

.5 Immediately clean up contaminated area.

.6 Ensure controlled access to storage site to prevent entry by unauthorized persons.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 02 82 00.01 Asbestos Abatement - Minimum Precautions

.2 02 82 00.02 Asbestos Abatement - Intermediate Precautions

.3 02 82 00.03 Asbestos Abatement - Maximum Precautions

1.2 REFERENCES

.1 American Conference of Governmental Industrial Hygienists (ACGIH), Bioaerosols Assessment and Control 1999.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 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

.4 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.

.5 United States Environmental Protection Agency (EPA), Mould Remediation in Schools and Commercial Buildings, 2001.

1.3 DEFINITIONS

.1 Authorized Visitors: Engineers, Consultants or designated representatives, and representatives of regulatory agencies.

.2 Cleaning solution: detergent solution

.3 Competent person: individuals 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: remediation contractor providing demolition and removal services as defined in specifications.

.5 Critical barrier or enclosure: minimum of two separate layers of 0.15 mm fibre reinforced polyethylene sheeting (FRPS) 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: 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 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 with fibre reinforced adhesive tape and weight bottom edge to ensure proper closing. Space curtained doorways minimum of 2 metres apart.

.7 Decontamination Room: 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): rip-proof polyethylene sheeting with fibre reinforced adhesive tape added along edges.

.9 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining particles greater than 0.3 microns at 99.97% efficiency.

.10 HVAC: 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 (MCWA): specific area or location where actual work is being performed or such other area of facility which it has been determined may be hazardous to public health as result of mould remediation.

.12 Negative pressure: 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: areas of building or work site that are outside Mould Contaminated Work Area.

.14 PPE: Personnel Protective Equipment.

.15 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray; with 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 control submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 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.

.3 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 supervisor for every ten trained workers.

.4 Submit proof of qualifications of both remediation supervisor and subcontractors including relevant job experience to project.

.5 Submit layout of proposed enclosures and decontamination facilities to Departmental Representative for review.

.6 Submit Provincial and/or local requirements for Notice of Project form.

.7 Submit proof of Contractors Liability Insurance for dealing with hazardous materials.

.8 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.

.9 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.
- .3 Disinfecting of equipment.
- .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 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 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 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.

1.11 HOURS OF WORK

.1 Typical work schedule - perform work during normal working hours. Be available to work continuously from beginning to end of project.

Part 2 Products

2.1 MATERIALS

.1 Drop Sheets: fibre reinforced polyethylene 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.

.2 Disposal bags: dust-tight 0.15 mm clear polyethylene waste bags.

.3 Wetting Agent: water to mist mould-containing material.

.4 Cleaning solution: detergent solution for damp wipe and/or mop.

.5 Fibre reinforced adhesive tape: 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 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: suitable for use with microbial contamination and must be able to withstand de-contamination.

.2 Personnel protective equipment (protective clothing, personal respiratory filter cartridges, HEPA air filters, etc.) provide in sufficient quantities for duration of project.

.3 Exhaust air fan systems: 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: 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: HEPA filters.

.6 Ladders and/or scaffolds: adequate length, strength and sufficient quantity to support work schedule.

Part 3 Execution

3.1 PREPARATION OF MOULD CONTAMINATED WORK AREAS (GREATER THAN 10 SQUARE METRES 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 supervisor for every ten 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 Do not use compressed air to clean up or remove dust from surfaces.

.6 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 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.

.7 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 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.

.8 Seal floor and wall surfaces within enclosure which are not to be removed as microbial waste with minimum of 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.

.9 Build worker Decontamination Room at exits from work areas.

.10 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.

.11 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.

.12 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: build Decontamination Room between Mould Contaminated Work Areas, with two curtained doorways, one to Mould Contaminated Work Area and one to uncontaminated areas. 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.

.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 Departmental Representative.

3.4 MICROBIAL REMEDIATION WORK AREAS

.1 Commence mould remediation work when:

.1 Mould Contaminated Work Areas and decontamination enclosures are effectively segregated from parts of building required to remain in use. Enclosures are to be inspected by Departmental Representative.

.2 Tools, equipment and materials waste containers are on site.

.3 Building security has been set up.

.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 where materials containing mould are to be cut or scraped. Perform work to reduce dust creation to lowest levels practicable.

.5 Remove microbially contaminated materials 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 Where designed waste container is not used, remove sealed containers containing mould waste and dispose following specified procedures.

.8 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.

3.5 REPAIR AND CLEAN-UP

.1 Dispose of used fibre reinforced polyethylene sheets, used fibre reinforced adhesive tape, cleaning material, clothing, and contaminated waste.

.2 Include sealed waste containers and equipment used in Mould Contaminated Work Areas in cleanup and removed from work areas, via Decontamination Room.

3.6 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 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.

.4 Remove waste bags and/or containers from site and dispose. There are no special requirements for disposal of mouldy materials, as such they can be disposed of in landfill.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This section specifies requirements and procedures for mercury precautionary measures. This section conforms to the requirements of the Ontario Occupational Health and Safety Act, R.S.O. 1990, O. Reg. 490/09, as amended, Designated Substances.

.2 Mercury vapour is assumed to be present within thermometers, thermostats, fluorescent light tubes, and High-intensity Discharge (HID) lamps, located throughout the Building.

.1 Comply with the requirements of this Section when performing the following work:

.1 Removal and disposal of equipment containing mercury.

.2 Removal and disposal of all fluorescent light tubes/HID Lamps.

.3 Refer to the Specification Section 01 14 25 for details on mercury-containing equipment.

1.2 RELATED REQUIREMENTS

.1 Section 02 81 01 – Schedule A Hazardous Materials Table.

1.3 REFERENCES

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

.2 Provincial legislation

.1 Ontario Occupational Health and Safety Act, R.S.O. 1990, O. Reg. 490/09, as amended, *Designated Substances*.

.2 Ontario Environmental Protection Act, R.R.O. 1990, O. Reg. 347, as amended, *General Waste Management*.

.3 Federal legislation

.1 Transportation of Dangerous Goods Act, 1992.

1.4 DEFINITIONS

.1 **Dangerous Goods:** product, substance, or organism that is specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 **Hazardous Material:** product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.3 **Hazardous Waste:** any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.4 **Hazardous Material Workplan**: A brief report identifying the location and quantities of hazardous materials and the methods that will be used to remove, store, transport and dispose of them.

.5 **Workplace Hazardous Materials Information System (WHMIS):** Canada-wide system designed to give employers and workers information about hazardous materials used in workplace. Under WHMIS, information on hazardous materials is provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by combination of federal and provincial laws.

1.5 ACTION AND INFORMATION SUBMITTALS

.1 Submit temporary waste location and description including:

.1 Precise location of mercury waste.

.2 Container storage method used.

.3 Spill containment features in place at storage site.

.4 Security measures in place at storage site.

.2 Identification of the following, for approval by the Departmental Representative:

.1 Licensed hauler, with a valid Certificate of Approval from the Ontario Ministry of the Environment (MOE) for a Waste Management System to transport the associated waste material.

.2 Authorized waste disposal or recycling location for the mercury materials.

.3 Mercury Abatement Section within Hazardous Materials Work Plan.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Ensure all personnel are familiar with and understand current mercury waste management procedures and use of personnel protection equipment and clean-up techniques.

.2 Dispose of Mercury Waste in accordance with Ontario Environmental Protection Act, R.R.O. 1990, O. Reg. 347, as amended, *General Waste Management*.

.1 Recycle Mercury components where possible.

1.7 RECORD KEEPING

.1 Maintain and make available for review by the Departmental Representative or authorities having jurisdiction:

.1 Receipt of waste/recyclable material showing:

.1 Date of receipt of waste/recyclable material.

.2 Description of mercury waste/recyclable material including quantity.

.3 Condition of mercury waste/recyclable material.

.4 Source of mercury waste/recyclable material.

.5 Name of carrier of mercury waste/recyclable material.

.6 Name of individual who accepted receipt of mercury waste/recyclable material.

.2 Removal of waste/recyclable material showing:

.1 Date of removal of mercury waste/recyclable material.
.2 Description of mercury waste/recyclable material including quantity.
.3 Condition of mercury waste/recyclable material.
.4 Name of carrier of mercury waste/recyclable material.
.5 Destination of mercury waste/recyclable material.
.6 Name of individual authorizing transport of mercury waste/recyclable material.

1.8 PERMITS

.1 Contractor is responsible to obtain all necessary permits, licenses and approvals to conduct the abatement (e.g. Ontario Ministry of the Environment (MOE) waste generating number, etc.).

Part 2 Products

2.1 MATERIALS

.1 Cardboard Containers: Manufacturer's cardboard container suitable for packaging light tubes (closed, with no lamp ends exposed) or other equivalent containers.

.2 Containment Drums: New 20 L metal pails with handles and sealable lids. Free from rust and punctures. Provided by Contractor.

.3 Drum Liners: clear polyethylene bags, 0.15 mm thick.

.4 Vermiculite: pre-packed, Industrial Grade 3, containing no asbestos.

2.2 EQUIPMENT

.1 Mercury Spill Response Kit consisting of:

.1 HEPA vacuum dedicated for use with mercury spills.
.2 Mercury absorbent materials in sufficient quantity.
.3 Air-purifying cartridge respirators with mercury absorbing cartridges and an end-of-life service indicator.
.4 Surgical gloves to prevent skin exposure when handling droplets of mercury. HEPA vacuum dedicated for use with mercury spills.
.5 Neutralizing compound such as 20% calcium polysulfide or 20% sodium thiosulfide to clean spilled surfaces. Surgical gloves to prevent skin exposure when handling droplets of mercury.

Part 3 Execution

3.1 PROCEDURES

.1 Fluorescent light tubes containing mercury vapour should be carefully removed to prevent breakage, stored in manufacturer's cardboard container (closed, with no lamp ends exposed) or other equivalent containers, and then transported to an approved recycling facility.

.2 Adequate ventilation should be employed immediately if a number of fluorescent light tubes are accidentally broken.

.3 Place polyethylene drum liner in containment drum. Pour a minimum of 100 mm layer of vermiculite into liner. Place mercury items in containment drum in a manner to prevent breakage. When full, or all items are placed in drum, seal liner bag with duct tape and place appropriate label on outside of containment drum.

.4 Thermometers, barometers and other mechanical components containing mercury should be carefully removed, stored in a Containment Drum with Drum Liner, and then transported to an approved hazardous recycling or waste disposal facility.

.5 Handle and dispose of contaminated waste as required by O. Reg. 347, as amended and the Federal Transportation of Dangerous Goods Act.

.6 Completed copies of waste manifests or landfill site receipts should be provided to the Departmental Representative.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This section specifies requirements and procedures for silica precautionary measures. This section conforms to the requirements of the Ontario Occupational Health and Safety Act, R.S.O. 1990, O. Reg. 490/09, as amended, Designated Substances.

.2 Comply with the requirements of this Section when performing the following work:

.1 Work at site which may involve contact with silica dust generated through such processes as sawing, cutting, grinding, blasting and/or breaking of the silica containing material.

.3 Silica is present in concrete elements, brick and mortar, plaster, etc. located throughout the Building. Refer to the Specification Section 01 14 25 – Designated Substance Report for details on silica-containing materials.

1.2 RELATED REQUIREMENTS

.1 Section 02 81 01 – Schedule A: Hazardous Materials Table.

1.3 REFERENCES

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

.2 Federal Legislation

.1 Canada Labour Code and associated regulations.

.3 Provincial legislation

.1 Ontario Occupational Health and Safety Act, R.S.O. 1990, O. Reg. 490/09, as amended, Designated Substances.

1.4 DEFINITIONS

.1 **Dangerous Goods:** product, substance, or organism that is specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 **Hazardous Material:** product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.3 **Hazardous Waste:** any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.4 **Hazardous Material Workplan:** A brief report identifying the location and quantities of hazardous materials and the methods that will be used to remove, store, transport and dispose of them.

.5 **Workplace Hazardous Materials Information System (WHMIS):** Canada-wide system designed to give employers and workers information about hazardous

materials used in workplace. Under WHMIS, information on hazardous materials is provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by combination of federal and provincial laws.

1.5 PRECAUTIONARY MEASURES AND PROCEDURES

.1 Execute work by methods to minimize raising silica dust from demolition operations. Where practical, wet methods or a dust collection system should be used to reduce dust, with consideration of heritage requirements regarding the use of water.

.2 Adequate ventilation, including local exhaust ventilation, should be maintained to prevent the accumulation and recirculation of harmful concentrations of free crystalline silica in the work area.

.3 As practical, processes that generate silica dust should be completed in enclosed areas wherever possible to prevent the spread of silica dust outside of the work area.

.4 Implement and maintain silica dust control measures during work to ensure that silica levels do not exceed allowable limits.

.5 Departmental Representative may stop work at any time when release of silica dust to adjacent area is suspected. Contractor must discuss procedures that are proposed to resolve the problem. Make all necessary changes to operations prior to resuming any demolition activities that may cause release of silica dust at no extra cost to the Departmental Representative.

.6 Silica dust should be cleaned from machinery and work surfaces by wet sweeping, the use of sweeping compounds, or vacuum cleaners fitted with a HEPA filter to prevent the recirculation of dusty air. Cleaning methods such as blowing with compressed air or dry sweeping should be avoided. Where exposure to free crystalline silica occurs, protective work clothing should be vacuumed before removal.

.7 Store material containing silica dust in closed containers or use other appropriate means to prevent dust from becoming airborne.

1.6 PERSONAL PROTECTIVE EQUIPMENT

.1 Anticipated levels of personal protection based on work activity involving silica dust are listed below and are in addition to the personal protective equipment required for the completion of the demolition activities.

.1 Air purifying half-mask respirator equipped with HEPA filter cartridges or supplied-air type, personally issued to the worker and marked as to efficiency and purpose, and acceptable to the Provincial Authority having jurisdiction as suitable for silica and the level of silica exposure in the Work Area. If disposable type filters are used, provide sufficient filters so that workers can install new filters following disposal of used filters and before re-entering contaminated areas.

.1 If higher levels of silica dust are suspected, generated, anticipated, etc. the use of respiratory protection appropriate for the exposure is required.

.2 Eye Protection: Goggles, Safety glasses with side shields, or Face shield.

.3 If requested by a worker,

.1 Hand Protection: Gloves

.2 Clothing: Full body protective clothing

1.7 AIR MONITORING

.1 If air monitoring shows that work areas contain crystalline silica above the specified action levels, these areas shall be cleaned by previously outlined methods at no additional cost to the Departmental Representative.

1.8 PERMITS

.1 Contractor is responsible to obtain all necessary permits, licenses and approvals to conduct the abatement (e.g. Ontario Ministry of the Environment (MOE) waste generating number, etc.).

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION