Part 1 GENERAL

1.1 Fire Safety Requirements

.1 Comply with both the National Building Code of Canada 2010 (NBC) and the National Fire Code of Canada 2010 (NFC) for safety of persons in buildings in the event of a fire and the protection of buildings from the effects of fire, as follows;

- .1 The NBC: for fire safety and fire protection features that are required to be incorporated in a building during construction.
- .2 The NFC:
  - .1 The on-going maintenance and use of the fire safety and fire protection features incorporated in buildings.
  - .2 The conduct of activities that might cause fire hazards in and around buildings.
  - .3 Limitations on hazardous contents in and around buildings.
  - .4 The establishment of fire safety plans.
  - .5 Fire safety at construction and demolition sites.

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.2 Welding and cutting:

- .1 At least one week prior to commencing cutting, welding or soldering procedure, provide to Departmental Representative:
  - .1 Notice of intent, indicating devices affected, time and duration of isolation or bypass.
  - .2 Completed welding permit as defined in NFC.
  - .3 Return welding permit to Departmental Representative immediately upon completion of procedures for which permit was issued.
- .2 "Fire Watchers" as described in NFC shall be assigned when welding or cutting operations are carried out in areas where combustible materials within 15m may be ignited by conduction or radiation.

.3 Immediately upon completion of work, restore fire protection systems to normal operation and verify that all devices are fully operational.

.4 Inform fire alarm system monitoring agency and local Fire Department immediately prior to isolation and immediately upon restoration of normal operation.

1.2 Signs

.1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices in both official languages or by the use of commonly-understood graphic symbols to the Departmental Representative's approval.

.2 No advertising will be permitted on this project.

1.3 Cost Breakdown

.1 Before submitting first progress claim submit breakdown of Contract Amount in detail as directed by Departmental Representative and aggregating the Contract Amount. After approval by Departmental Representative cost breakdown will be used as the basis of progress payments.

END OF SECTION

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract occurs at the Central Experimental Farm (CEF), Ottawa, Ontario.

.2 The Work includes two distinct parts:

.1 Part 1 is the deconstruction and demolition of the Central Heating Plant (CHP) Building and related nearby site development.

.2 Part 2 is the abandonment of the Tunnel Distribution System (TDS) leading from the CHP to other buildings on the CEF and filling it with lightweight cellular concrete fill.

.3 Part 1 - Refer to Drawing A-100, Site Plan - Limit of Contract Area. Unless otherwise noted the work for Part 1, within Limit of Contract Area includes:

.1 Hard Landscape:

.1 Remove roads, asphalt parking areas, areas of unit pavers, sidewalks, stairs, and curbs.

.2 Remove signs, light standards, flagpoles, security cameras, retaining walls along with footings.

.3 Grade disturbed areas to blend with adjacent grades.

.4 Backfill excavations to match adjacent grades. Provide layer of topsoil and sod at areas of removals.

.2 Soft Landscape:

.1 Remove only designated trees and plant materials.

.2 Protect all other trees and plant materials from damage.

.3 Protect grassed areas from damage.

.4 Repair any damage to grassed areas by installation of sod.

.3 Buried Utilities:

.1 Remove water mains, storm sewers, sanitary sewers, gas lines, high and low voltage electrical cables and conduit, telephone cables and conduit, cable lines and conduit, and fibre optic cable and conduit. Refer to drawings.

.2 Remove manholes and thrust blocks.

.3 Backfill excavations to match adjacent grades. Provide layer of topsoil and sod at areas of removals.

.4 Remove underground storage tanks.

.4 CHP Building:

.1 Remove asbestos containing materials, mould and all other Designated Substances and Hazardous Materials.

.2 Remove loose furniture, equipment and debris.

.3 Demolish and/or deconstruct the entire building including heating plant equipment, finishes, partitions, stairs, catwalks, mechanical and electrical systems, exterior wall assembly, roof and structure including slabs, columns, and shear walls.

.4 Demolish and/or deconstruct the entire basement and foundations including slab on grade, strip footings and foundation walls.

.5 Piles, pile caps and grade beams may remain abandoned in place.

.6 Backfill excavations. Provide layer of topsoil and sod at areas of removals.

.4 Part 2 - Refer to Drawing D-100, Tunnel Distribution System Plan (TDS). Unless otherwise noted, the work for Part 2 includes:

.1 Remove asbestos containing materials, mould and all other Designated Substances and Hazardous Materials.

.2 Remove all piping, conduit, wiring and mechanical, electrical and communications components.

.3 At the junctions of the TDS with direct buried distribution branches, sever the piping and conduit as it exits the TDS.

.4 Provide formwork to seal all openings in the floor or walls of the TDS to prevent fill from seeking out.

.5 At the termination point of the TDS with Building 20 - K. W. Neatby Building, remove the access door and frame. Infill the door opening with concrete block. Paint to match adjacent wall colour. Reinforce and brace the existing and new concrete block walls to contend with imposed loads during the installation of concrete fill.

.6 Completely fill the interior of the TDS with lightweight cellular concrete fill.

.7 Utilize access and ventilation shafts to place the fill. Where necessary, and with the Departmental Representative's approval, create new openings to place the fill.

.8 Remove manholes, access hatches and ventilation shafts from the point of intersection at the top of the roof slab of the TDS to grade. Backfill excavations to match adjacent grades. Provide layer of topsoil and sod at areas of removals.

.5 Remove all demolished materials from site. Divert a minimum 75% of waste materials from landfill to recycling or reuse facilities. Refer to Section 01 74 21 – Construction / Demolition Waste Management and Disposal.

.6 Removed materials may be used as backfill provided they are processed to remove foreign materials and are reduced to an acceptable size in accordance with OPSS 1010. These removed materials include cast-in-place reinforced concrete, precast concrete, concrete block, unit pavers, glass, ceramic tile, brick, granular stone base courses and other materials. Refer to Section 31 23 33.01 – Excavating, Trenching and Backfilling.

.7 Demolition may use any legal method acceptable to Authorities Having Jurisdiction, except implosion.

.8 Repair and make good all damaged services, roadways, hard and soft landscape elements affected by Work both inside and outside of the Limit of Contract Area.

1.2 WORK BY OTHERS

.1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Departmental Representative.

.2 Co-ordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Departmental Representative, in writing, any defects which may interfere with proper execution of Work.

1.3 CONTRACTOR USE OF PREMISES

.1 Generally unrestricted use of site, identified as Limit of Contract Area, until Interim Completion. Refer to Section 01 14 00 - Work Restrictions.

.2 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.3 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.4 OWNER OCCUPANCY .1 CHP and TDS will be vacant during entire deconstruction period.

1.5 EXISTING SERVICES .1 All existing services, including power, water, natural gas and telecommunications, serving the CHP and TDS will be terminated by Departmental Representative prior to takeover by the Contractor.

.2 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.

.3 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic.

.4 Provide alternative routes for personnel, pedestrian and vehicular traffic.

.5 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.

.6 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

.7 Provide temporary services when directed by Departmental Representative to maintain critical CEF site systems.

.8 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

.9 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.

.10 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.11 Record locations of maintained, re-routed and abandoned service lines.

.12 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.6 DOCUMENTS REQUIRED .1 Maintain at job site, one copy each document as follows:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Standards, Regulations, Guidelines and other documents referenced in the Specifications.
- .4 Addenda.
- .5 Reviewed Shop Drawings.
- .6 List of Outstanding Shop Drawings.

.7 Change Orders.
.8 Other Modifications to Contract.
.9 Field Test Reports.
.10 Copy of Approved Work Schedule.
.11 Health and Safety Plan and Other Safety Related Documents.
.12 Submissions made to, and documents received from, Authorities Having Jurisdiction.
.13 Original Construction Documents.
.14 Other documents as specified.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 USE OF SITE AND FACILITIES .1 Execute work with least possible interference or disturbance to normal use of Central Experimental Farm (CEF) site. Make arrangements with Departmental Representative to facilitate work as stated.

.2 Maintain existing services to other buildings on CEF site and provide for personnel and vehicle access.

.3 Where security is reduced by work provide temporary means to maintain security.

.4 Closures: protect work temporarily until work is completed.

.5 Construct barriers in accordance with Section 01 56 00 - temporary Barriers and Enclosures.

1.2 SCHEDULE RESTRICTIONS .1 Refer to drawings for construction area and proposed access routes. Keep all construction activities within the Limit of Contract Areas.

.2 Between award of contract and 1 November 2014:
.1 No work related to the demolition or deconstruction of the CHP may occur; however minor non-disruptive work may occur within the CHP and TDS south of the NCC Driveway.
.2 No erection of Perimeter Safety Fence near the CHP.
.3 No use of Contractor Staging Area near the CHP.
.4 Work related to the TDS north of the NCC Driveway and east of Birch Drive may occur.

.3 The Contractor Staging Area near the CHP will be turned over to the Contractor on 1 November 2014.

.4 Between 1 November 2014 and 16 April 2015:
.1 Work related to the general demolition or deconstruction of the CHP may occur.
.2 Perimeter Safety Fence at the CHP must be in place.
.3 Contractor Staging Area may be used.
.4 Work related to the full TDS may occur.

.5 Complete the demolition of CHP and complete site reinstatement at the CHP by 16 April 2015.

.6 The Contractor Staging Area near the CHP must be turned over to PWGSC before 16 April 2015. Remove Perimeter Safety Fence at the CHP.

.7 After 16 April 2015:
.1 Work related to the full TDS may occur.

1.3 VEHICLE RESTRICTIONS .1 Comply with the approved Traffic Management Plan. See Section 01 52 00 - Construction Facilities.

.2 Do not block public vehicular access to public parking areas without redirecting vehicles to alternate routes as in accordance with the approved Traffic Management Plan.
.1 At all times maintain and protect public vehicular access from Prince of Wales Drive to the Canada Agriculture Museum Public Parking Lot. Provide bilingual directional way-finding signage for the public.

.3 Do not block public pedestrian access to the Museum or Ornamental Gardens without redirecting the public to alternate routes as in accordance with the approved Traffic Management Plan.

.1 At all times maintain and protect public pedestrian access from the Canada Agriculture Museum Public Parking Lot south of the CHP, along the west side of the CHP Deconstruction Area, to the Canada Agriculture Museum Buildings in general and Buildings 91A and 151 in particular. Provide bilingual directional way-finding signage for the public.

.2 At all times maintain and protect public pedestrian access from the Canada Agriculture Museum Public Parking Lot south of the CHP, along the west and north sides of the CHP Deconstruction Area, to the Ornamental Gardens in general and the Preston Lilac Collection in particular. Provide bilingual directional way-finding signage for the public.

.4 Do not encumber the Canada Agriculture Museum Public Parking Lot or access roadways with construction or workers' vehicles.

.5 With the permission of the Departmental Representative, workers may use the public parking lots to park their vehicles but must pay for parking and observe all parking regulations and restrictions. These vehicles must be parked as far away from the Museum as possible to preserve the closer spaces for the public. The Departmental Representative may withdraw permission at any time.

.6 Do not use the Canada Agriculture Museum Public Parking for construction activities.

1.4 EXISTING SERVICES

.1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission in writing.

.2 Where Work involves terminating, breaking into or connecting to existing site services, give Departmental Representative 48 hours of notice for necessary interruption of site services throughout course of work. Keep duration of interruptions to a minimum. Carry out interruptions after normal working hours and preferably on weekends.

.3 Provide for pedestrian and vehicular traffic.

.4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 – GENERAL

1.1 REGULATORY REQUIREMENTS

.1 An investigation into the presence of designated substances for the Central Experimental Farm (CEF), Central Heating Plant (CHP) Decommissioning and Deconstruction at Building 78, Prince of Wales Drive, Ottawa, Ontario, was performed in order to meet the requirements of Section 30 of the *Ontario Occupational Health and Safety Act, Revised Statutes of Ontario, 1990, Chapter 0.1*. The *Canada Labour Code* also stipulates under Part II, Section 124 that every employer shall ensure that the health and safety at work of every person employed by the employer is protected. By having a Designated Substances Report (DSR) completed, the Departmental Representative will be able to inform his or her employees, contractors, and tenants of any designated substances that may be present and possibly disturbed throughout the duration of the project. The informed Departmental Representative will then be able to impose appropriate health and safety precautions for all applicable personnel as required. The *Guide to Green Government* sets out the policy requirements for the federal government to meet or exceed federal environmental statutes and regulations, and the emulation of best practices from the public and private sector. Within the *Guide to Green Government*, pollution prevention efforts are required in federal projects. Pollution prevention is defined as the use of processes, practices, materials, products or energy that avoid or minimize the creation of pollutants and waste, and reduce overall risk to human health and environment. These policies must be adhered to throughout the duration of any of the scheduled decommissioning/demolition work to be performed at the CEF CHP including the Distribution Tunnel.

.2 The designated substances identified in the *Occupational Health and Safety Act* and its corresponding regulations are:

.1 **Acrylonitrile**: "Designated Substances"
O. Reg 490/09, as amended.

.2 **Arsenic**: "Designated Substances"
O. Reg 490/09, as amended.

.3 **Asbestos**

.1 "Designated Substances"
O. Reg 490/09, as amended.

.2 "General – Waste Management"
O. Reg 347/09, as amended

.3 "Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations"
O.Reg 278/05 (as amended)

.4 *PWGSC Departmental Policy DP 057 – "Asbestos Management"*

.4 **Benzene**: "Designated Substances" *O. Reg 490/09,* as amended.

.5 **Coke Oven Emissions**: "Designated Substances" *O. Reg 490/09,* as amended.

.6 **Ethylene Oxide**: "Designated Substances" *O. Reg 490/09,* as amended.

.7 **Isocyanates**: "Designated Substances" *O. Reg 490/09,* as amended.

.8 **Lead:**

.1 "Designated Substances" *O. Reg 490/09,* as amended.

.2 "General – Waste Management" O. Reg 347/09, as amended

.3 Hazardous Products Act's *Surface Coating Materials Regulations* SOR/2005-109, as amended (2011)

.9 **Mercury**:

.1 "Designated Substances" *O. Reg 490/09,* as amended.

.2 "General – Waste Management" O. Reg 347/09, as amended

.10 **Silica**: "Designated Substances" *O. Reg 490/09),* as amended.

.11 **Vinyl Chloride**: "Designated Substances" *O. Reg 490/09,* as amended.

.3 All contractors requesting tenders from subcontractors shall furnish this report to subcontractors.

1.2 VALIDITY DATE

.1 DST Consulting Engineers Inc. (DST), conducted the on-site survey for this report on November 1, 2, 14, 27, and December 5, 2012 (DST File No. BE-OT-015686) & January 10, 2013 (DST File No. BE-OT-015746)

.2 DST staff completed a visual inspection of building materials for the presence of suspected designated substances within the project area. A limited visual evaluation of the Coal Bunkers was performed from the Basement access hatches and a ground floor garage wall opening. The CHP Distribution Tunnel was also accessed and surveyed. The Boilers were also accessed for material sample collection.

.1 The scope of work for this report involved a visual inspection of building materials and

contents for the presence of suspected designated substances within the CEF CHP on November 1, 2 & 14, 27, and December 5, 2012. The CHP Distribution Tunnel was accessed and surveyed on November 27, 2012. The Boilers were accessed for material sample collection on December 5, 2012. Another site visit to collect samples from the CHP and CHP Distribution Tunnel was conducted on January 10, 2013.

.2 From the visual inspection, suspect materials were sampled and analyzed, for select designated substances. On the basis of this inspection, a total of fifty (50) bulk samples of suspected asbestos-containing material were collected. A total of eight (8) bulk samples of suspected lead-containing paint were collected. A total of seven (7) bulk samples were analysed for lead leachate using the Toxicity characteristic leaching procedure (TCLP).

.3 Samples were submitted for analysis at Paracel Laboratories Ltd, located in Ottawa. Suspected asbestos-containing material samples were analyzed using Polarized Light Microscopy (PLM) or Transmission Electron Microscopy (TEM) / X- Ray Analysis (TEM/EDX) / Gravimetric Analysis.

.4 A reasonable effort was made to capture all potential designated substances, and hazardous materials deemed pertinent. Note, however, that no scope of work, no matter how exhaustive, can identify all potential contaminants. Should any designated substance (or potential hazardous materials) not apparent from the survey be encountered in the course of demolition or renovation work, work shall be stopped, preventative measures taken, and the Departmental Representative notified immediately. Do not proceed until written instructions have been received.

.6 Prior to beginning work, it must be confirmed with the Departmental Representative that no additional designated substances have been brought to the project area.

.7 In addition, the survey refers to Polychlorinated Biphenyls (PCBs), Halocarbons; chemicals, and other hazardous materials that the investigators felt pertinent.

.8 There is a possibility that materials that could not be reasonably identified within the scope of this assessment or which were not apparent during previous site visits may exist. Should any designated substance be encountered in the course of demolition or renovation, work must be stopped, preventative measures taken, and the Departmental Representative must be notified immediately. **Do not proceed until written instructions have been received**.

PART 2 - DESIGNATED SUBSTANCES

2.1 SURVEY RESULTS

.1 **ACRYLONITRILE**: Not Identified

.2 **ARSENIC**: **Identified**

Soot and other debris were noted in the soot ('heavies") collectors at each of the induced fan units.

Toxicity characteristic leaching procedure (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 leachate toxic waste.

.3 **ASBESTOS**: **Identified**

Asbestos is a naturally occurring material. In general, it has historically been intentionally added to many building materials in the construction industry to increase thermal or chemical resistance properties. More common uses are thermal insulation for pipes and boilers, structural steelwork fireproofing, floor tiles and in-wall and ceiling plasters. There are two classes of asbestos-containing materials: friable and non-friable. Friable asbestos-containing materials are loose in composition or can be easily crumbled using hand pressure. Non-friable asbestos-containing materials are more durable and are held together by a binder such as cement, vinyl or asphalt.

Representative bulk samples, collected from materials located within the project areas, have been analyzed for asbestos. Analytical results indicate

that select samples contain asbestos in the project areas. The following table below summarizes the analytical results of bulk samples collected during the site investigation.

Table 1 summarizes the analytical results of building material samples collected from the project area that were analyzed for asbestos content.

Table 1: Asbestos Sample Results by PLM and TEM[1] (denoted by TEM prefix)

Sample number	Material	Sample Location	Asbestos Type	Asbestos content (%)
015686-01A	White Insulation on Pipe Run	Basement, High Temperature Hot Water Pipe Run	n/d	n/a
015686-01B		Basement, High Temperature Hot Water Pipe Run	n/d	n/a
015686-01C	White Insulation on Generator Exhaust	Ground Floor, Diesel Room	n/d	n/a
015686-02	Brown/Gray Fitting Insulation (red fittings)	Basement, Near East Metal Stairs	n/d	n/a
015686-03		Basement, Near East Metal Stairs	n/d	n/a
015686-04		Basement, Northeast corner	n/d	n/a
015686-05	**Metal Clad Cap Insulation**	**Basement, Header**	**20% Chrysotile**	
015686-TEM-06	Drywall Joint Compound	Ground Floor, Washroom Shower Area	n/d	n/a
015686-07	**Drain Pipe Joint Caulking**	**Ground Floor, Garage**	**40% Chrysotile**	
015686-08	**Transite**	**Ground Floor, Circular Stairwell**	**20% Chrysotile**	
015686-09	**End Cap Insulation**	**High Temperature Hot Water Pipe Run, Boiler Side Mezzanine Level**	**60% Chrysotile**	
015686-TEM-10	Plaster (White and Gray Layers)	Basement, Plaster (debris) on top of Tunnel Entrance Ceiling Slab	n/d	n/a
015686-11A	**White Caulking**	**Building Exterior at Copper Flashing**	**5% Chrysotile**	
015686-11B			Not Analysed	
015686-11C			Not Analysed	
015686-TEM-11			Not Analysed	
015686-12A	Roof Core (Multiple Layers Analyzed)	1st Roof level	n/d	n/a
015686-12B		2nd Roof Level	n/d	n/a
015686-12C		3rd Roof Level	n/d	n/a
015686-TEM-12		3rd Roof Level	n/d	n/a
B-01A	**Parging**	**Boiler #1, on floor of Return Header**	**1% Chrysotile**	
B-01B		Boiler #1, on floor of Return Header	Not Analysed	
B-01C		Boiler #1, on side of Return Header	Not Analysed	
B-02A	Castable	Boiler #1, Return Header Hatch	n/d	n/a

[1] See Appendix B Laboratory Certificates of Analysis for individual layer results within samples.

Sample number	Material	Sample Location	Asbestos Type	Asbestos content (%)
B-02B	material	Boiler #2, Header Hatch	n/d	n/a
B-02C		Boiler #2, Header Hatch	n/d	n/a
B-03A	Throat Parging	Boiler #1, Fire Box Throat	n/d	n/a
B-03B		Boiler #2, Fire Box Throat	n/d	n/a
B-03C		Boiler #3, Fire Box Throat	n/d	n/a
B-04	Thermal Patch	Boiler # 3, Fire Box	n/d	n/a
B-05A	Fire Brick	Boiler #1, Fire Box Side Wall	n/d	n/a
B-05B		Boiler #2, Fire Box Side Wall	n/d	n/a
B-05C		Boiler #3, Fire Box Side Wall	n/d	n/a
B-06A	Parging	Boiler #1, Fire Box Side Wall	n/d	n/a
B-06B		Boiler #2, Fire Box Side Wall	n/d	n/a
B-06C		Boiler #3, Fire Box Side Wall	n/d	n/a
B-07A	**Castable material**	**Boiler #1, Fire Box Side Wall**	**9.79% Chrysotile**	
B-07B			n/d	n/a
B-07C			n/d	n/a
B-08A	**Parging**	**Boiler #1, Upper Side Wall**	**1% Tremolite**	
B-08B		**Boiler #2, Upper Side Wall**	**1% Chrysotile**	
B-08C		**Boiler #3, Upper Side Wall**	**1% Chrysotile**	
B-08D		Boiler #3, Fire Box Side Wall	n/d	n/a
B-08E		Boiler #3, Fire Box Side Wall	n/d	n/a
B-09A	**Insulation**	**Boiler #1, Concealed beneath Boiler floor**	**40% Amosite**	
B-09B			Not Analysed	
B-09C			Not Analysed	
B-10A	30 cm x 30 cm Fire Brick	Boiler #3, sloped floor from throat	n/d	n/a
B-10B			n/d	n/a
B-10C			n/d	n/a

Bold items exceed the 0.5% regulated concentration of asbestos, as per *O.Reg. 278/05*, as amended.
n/d = none detected, n/a = not applicable

Friable Material

Past investigations and the analytical results from the current bulk sampling program indicate that the following friable materials are present at the building:

- 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 (poor condition);
- Metal clad cap insulation (**Sample 015686-05**) on a header in the basement (good condition);
- End cap insulation on the high Temperature Hot Water pipe run (**Sample 015686-09**) (good condition);
- Grey pipe elbow insulation on domestic water pipes (good condition);
- Select pipe elbow insulation (painted red) (good condition);
- Antisweat insulation on domestic water pipes and drain pipes (good/fair condition);

- Grey parging insulation over white non-asbestos insulation on Emergency Generator Pipe elbows and hangers (fair condition);

- Insulation on middle section of induced fan units (3 units) (good condition);

- Grey/beige parging insulation on the floor and sides of the Return Header of Boiler #1 (**Sample B01-A**) (good condition). This material is also suspected present in the same areas of Boiler # 2 & 3;

- Grey/beige castable parging insulation in the Fire Box side wall of Boiler #1 (**Sample B07-A**) (good condition). This material was not seen in the same areas of Boiler # 2 & 3;

- Parging insulation on the upper side walls of Boiler #1, #2 & #3 (**Samples B08-A-C**) (good condition);

- Brown insulation concealed beneath the floor of Boiler #1 (**Sample B09-A**) (good condition). This material is also suspected present concealed beneath the floors of Boiler # 2 & 3.

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. As intensive destructive testing would be required to delineate fitting insulation type in the basement, it may be more practical to consider all pipe fitting insulation as asbestos-containing for abatement purposes. There are approximately 110 of these fittings throughout the basement. One (1) asbestos-containing elbow was noted associated with the heater in the Diesel Room. One (1) suspect asbestos-containing elbow was noted associated with a pipe beneath the North most make-up tank at the make-up tank level. Approximately four (4) elbows insulated with suspect asbestos-containing material at the Return Header at the boiler base are associated with each Boiler.

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.

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 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, it may be more practical to treat all boiler materials as asbestos-containing for abatement purposes.

Non-Friable Material

Past investigations and the analytical results from the current bulk sampling indicate that the following non-friable materials are present at the Building:

- Cast Iron Drain Pipe Bell Joint Caulking at cleanout in ground floor garage (**Sample 015686-07**)(good condition);

- Transite panel (**Sample 015686-08**), east stairwell and circular stairwell walls, ceiling of ground floor storage room off garage (some mechanical breakage in a few areas but no debris – good condition);

- Transite ceiling tile remnants (suspect) on concealed ceiling tracking in ceiling space of ground floor kitchen and Front Office (mechanical breakage – good condition);

- Light heat shielding (suspect), ground floor storage room off garage (good condition);

- Mechanical ventilation dampeners (suspect), basement and 5th floor (good condition);

- Gasket material on soot (”heavies”) collectors, and select Boiler hatches (suspect) (good condition);

- White exterior caulking at copper flashing at building entrance (**Sample 015686-11A**)(good condition);

- Metal fire doors on the ground floor have an “aircell” insulation core which is assumed to contain asbestos (concealed, good condition).

The majority of Drain Pipe Bell Joint Caulking contained lead rather than asbestos (see below). Asbestos-containing Drain Pipe Bell Joint Caulking was only observed in one instance.

Non-Asbestos-Containing Materials

The following materials sampled either during the past or current survey, and analysed, were determined not to contain regulated amounts of asbestos:

- Pipe insulation on large pipes situated against metal grate/catwalk floor, induced fan units, East side of level 4;

- White insulation on High Temperature Hot Water pipe run and emergency generator muffler exhaust (Samples 015686-01A-C);

- Brown/grey pipe fitting insulation (select red painted fittings) (Samples 015686-02, 03 & 04);

- Pipe fitting parging cement in CHP Distribution Tunnel;

- Tar paper on pipes in CHP Distribution Tunnel;

- Lay-in ceiling tiles, ground floor;

- Drywall joint compound (Sample 015686-TEM-07**)**;

- Grey/brown speck vinyl floor tile and mastic, ground floor Maintenance Office (Office and floor tiles no longer present);

- Wall plaster, ground floor and basement (Sample 015686-TEM-10**)** ;

- Black baseboard and mastic, ground floor;

- Grey loose powder on red painted fittings;

- Roofing materials (Samples 015686-12A-C and TEM-12**)**.
- Select Boiler insulation materials (See Table 1); however, it may be more practical to treat these materials as asbestos-containing for abatement purposes (See Above).

.4 **BENZENE:** Not Identified

.5 **COKE OVEN EMISSIONS:** Not Identified

.6 **ETHYLENE OXIDE:** Not Identified

.7 **ISOCYANATES:** Not Identified

.8 **LEAD: Identified**

Lead is a naturally occurring metal. It was used primarily in paint prior to the 1980s to increase the drying process. Lead in paint becomes a danger when it is old or damaged, as it creates lead dust and chips. Lead can also be found in soldered joints installed on piping up to the mid 1990s and in older cast iron bell and spigot joints.

.1 According to the Hazard Products Act's *Surface Coating Materials Regulations* SOR/2005-109, as amended, allowable concentration of lead of surface coatings is 0.009 percent by weight (weight of lead to weight of paint), which is equivalent to 90 parts per million (ppm).

.3 Six (6) representative paint chip samples were collected by DST during the site investigation on November 1 & 2, 2012. An additional two (2) paint chip samples from the CHP Distribution Tunnel were collected on January 10, 2013. Table 2 summarizes the analytical results of the paint chip samples collected and analyzed for lead content.

Table 2: Lead Paint Sample Results

Sample Number	Description	Location	Lead Content (µg/g)[1]
015686 - LP01	**Grey/red floor paint**	**Basement – Laundry Area**	**298**
015686 - LP02	**Grey wall paint**	**Basement – Chemical Storage Room**	**124**
015686 - LP03	**Grey duct paint**	**Basement – Laundry Area**	**2,870**
015686 - LP04	**Grey wall paint**	**Ground Floor – Kitchen**	**1,490**
015686 - LP05	**Red floor paint**	**Ground Floor – Electrical Room**	**3,050**
015686 - LP06	**Green wall paint**	**Ground Floor – Circular Stairwell**	**7,080**
T-Pb-01	**Black Metal Bracket paint**	**CHP Distribution Tunnel (Main section off of CHP)**	**12,500**
T-Pb-02	**Black Metal Bracket paint**	**CHP Distribution Tunnel (Sir John Carling Bldg. Section)**	**658**

1 One µg/g is the equivalent of one part per million (ppm)
Bold items exceed the 90 ppm limit for lead, as per Hazardous Products Act's Surface Coating Materials Regulations SOR/2005-109

All paints sampled had a lead concentration greater than 90 ppm.

.4 Various equipment (e.g. boilers, etc.), doors and door frames are also painted with paint suspected to contain lead.

.5 Drain pipe joint caulking (majority of joints), Emergency light batteries, ceramic tile glazing, and solder on copper piping are also suspected to contain lead.

.6 Seven (7) representative bulk samples (representative paints on metal brackets in the CHP Distribution Tunnel, grey painted floor slab (Basement), ceramic tile, and green, grey, white painted concrete block wall) were collected by DST on January 10, 2013. These samples were analysed for lead leachate using the TCLP. Table 3 summarizes the analytical results for these samples.

Table 3: Lead Leachate (TCLP) Sample Results

Sample Number	Description	Location	Lead Content (mg/L)
T-L-01	Black Metal Bracket paint	CHP Distribution Tunnel (Main section off of CHP)	0.46
T-L-02	Black Metal Bracket paint	CHP Distribution Tunnel (Sir John Carling Bldg. Section)	0.05
L-01	Grey Painted Concrete Floor Slab	Basement	< 0.05
L-02	Ceramic Tile	Ground Floor – Washroom	< 0.05
L-03	Grey Painted Concrete Block Wall	Ground Floor – Boiler Room	< 0.05
L-04	Green Painted Concrete Block Wall	Ground Floor – Garage	< 0.05
L-05	White Painted Concrete Wall	At Front of Boiler Room	< 0.05

The TCLP results indicate that these paints and materials are not considered solid hazardous waste with respect to lead.

.9 **MERCURY: Identified**

Mercury is present in fluorescent light tubes, and HID lamps in the building and CHP Distribution Tunnel.

Mercury is also suspected present within electrical switches in equipment throughout the building.

.10 **SILICA: Identified**

Free crystalline silica is assumed present in plaster, ceramic tiles, ceiling tiles, concrete building materials, and brick and mortar in the building and CHP Distribution Tunnel.

.11 **VINYL CHLORIDE MONOMER:** Not Identified

.12 **OTHER HAZARDOUS MATERIALS: Identified**

.1 **POLYCHLORINATED BIPHENYLS (PCBs): Suspected**

Although not a designated substance, polychlorinated biphenyls (PCBs) can generally be found within fluorescent light fixture and High Intensity Discharge (HID) lamp ballasts. DST did not disassemble any of the light fixtures in the project areas to identify the presence of ballasts, as the light

fixtures were energized at the time of site visit. Three readily visible ballasts were observed and determined not to contain PCBs as determined by their labels:

Basement Stock Room, *Advance* brand ballast: labeled “No PCB’s”.

CHP Distribution Tunnel, *Advance* brand and *Sylvania* brand ballasts: labeled “No PCB’s”.

However, some fluorescent light fixtures were observed in which their ballasts could not be verified. These fixtures appeared to be of vintage when PCB-containing ballasts were in use. These ballasts are suspected to contain PCBs.

In the event that suspected light fixture ballasts are encountered and require disturbance, please refer to the Environment Canada, Identification of Lamp Ballasts Containing PCBs, August 1991 report, for assistance with identification of potential PCB-containing ballasts.

Two (2) oil cooled transformer were observed which may contain PCBs. One of these was disconnected and stored on a wood skid along the exterior west side lot of the building. The other was pad mounted on the southwest lawn adjacent to the building.

.2 **HALOCARBONS: Identified**

Although not a designated substance, halocarbons are commonly used in refrigeration and air-conditioning equipment, fire suppression equipment and solvents. The most common are chlorofluorocarbons (CFCs and its derivatives) which when released into the air, rise to the upper atmosphere and destroy the ozone layer.

During the site investigation the following equipment were marked (as per nameplate info) as containing refrigerant:

A compressed air dryer was located in the basement and was charged with R-134a.

A refrigerator was located in the kitchen as well as just outside of the kitchen. These units were charged with R-134a and R-12 respectively.

A soft drink cooler which was charged with R-12 was located just outside of the kitchen.

A drinking fountain, charged with R-12, was located in the main entrance area of the building.

Six (6) A/C units were located in various rooms on the ground floor of the building including the control booth, chief office, kitchen, men's washroom, maintenance office and drawing office. These units were charged with R-22 with the exception of the ones located in the men's washroom and chief office which were charged with R-410a.

.3 **MISCELLANEOUS MATERIALS: Identified**

Miscellaneous chemicals (e.g. acids, bases, water treatment chemicals, aerosols, spray sealants, lubricants, cleaners, degreasers, compressor fluid, etc.) for maintenance operations were located in Flammable storage cabinets in the basement Chemical Storage room, and ground floor of 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 additional 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.

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 the induced fan units. 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 leachate toxic waste.

Rodent droppings were observed on the kitchen counter and above the false ceiling in a few areas of the ground floor.

Pipe insulation canvas in the CHP Distribution Tunnel leading to the Sir John Carling Building showed suspected mould growth.

2.2 RECOMMENDATIONS

1. ARSENIC

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 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.

2. ASBESTOS

PWGSC's *DP 057, Asbestos Management* sets policy, establishes roles and responsibilities and provides a code of practice for the management of and working with asbestos-containing materials. All work must be done in accordance with this directive, as well as all other applicable legislation. Disturbance of all asbestos (whether friable or non-friable) is regulated in Ontario by "Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations" *O.Reg 278/05, as amended,* which outlines the precautions required when performing work involving asbestos-containing materials. The regulation stipulates appropriate respiratory protection, work procedures and ventilation requirements that must be utilized during the disturbance of any asbestos-containing materials, or materials suspected to contain asbestos.

In the event of conflict between DP-057 and "Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations" *O.Reg 278/05, as amended*, the more stringent shall apply.

The "General – Waste Management" *O.Reg 347* governs the disposal of waste containing asbestos. The waste must be disposed at a licensed waste disposal site.

3. LEAD

If lead-containing materials are disturbed (i.e. during demolition, dry sanding, grinding, polishing and sawing operations), then proper precautions, as outlined under “Designated Substances” *O.Reg 490/09*, as amended, of the Occupational Health and Safety Act, must be followed.

Under Ontario Regulation 490/09, as amended of the Occupational Health and Safety Act, regulatory limits have been established for occupational exposure limits to airborne lead that may be present in a workplace. The Time Weighted Average Exposure Values to airborne lead dust or fumes should not exceed the Ministry of Labour’s 0.05 milligram per cubic metre (mg/m^3) limit during the removal of paints and products containing any concentration of lead. The TWAEV represents the time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

Contractors performing work that requires disturbance of lead-containing materials are responsible to ensure that the workers are not exposed to airborne lead dust levels in excess of the time-weighted average and Maximum Exposure Concentration for lead-containing paints.

.1 Ontario Ministry of Labour (MoL) has published the document entitled “*Guideline: Lead on Construction Projects*”. This document classifies all disturbances of lead-containing materials as Type 1, Type 2a, Type 2b, Type 3a or Type 3b work, based on presumed airborne concentrations of lead generated during the work each of which will have defined work practices. Although this document is not a regulation, Ministry of Labour Inspectors use it as guidance during site inspections. Where there is conflict with the exposure limits and respiratory protection required by “Designated Substances” Regulation *O.Reg 490/09*, as amended, the most stringent requirements of Regulation *490/09* must apply

.2 The disposal of construction waste containing lead is controlled by “General – Waste Management” *O.Reg 347/09, as amended*, under the *Ontario Environmental Protection Act*. The classification of the waste is dependent upon the result(s) of leachate test(s). The waste can be classified as "hazardous", "non-hazardous" or

"registerable solid waste", depending on the results of the leachate test.

Prior to disposal, the concentration of leachable lead must be determined for waste materials with elevated lead contents following the Toxicity Characteristic Leaching Procedure (TCLP).

The removal of suspected lead-containing painted materials in the project areas can be removed using Type 1 work procedures, provided the work is done using non-powered hand held tools, and no manual scraping or sanding is used. If these conditions cannot be met, then more stringent (Type 2 or Type 3) work procedures are required.

4. MERCURY

.1 Mercury is governed by "Designated Substances" *O.Reg 490/09,* as amended, under the Occupational Health and Safety Act. The regulation provides requirements for allowable exposure levels.

.2 In addition, mercury waste is considered a hazardous waste under "General – Waste Management" *O.Reg 347/09, as amended,* of the *Ontario Environmental Protection Act*. Fluorescent lamp tubes are considered hazardous material and should be recycled if removed from service. For information regarding the collection of fluorescent lamp tubes, please consult the PWGSC Representative.

5. SILICA

.1 Silica occurs as crystalline material in plaster, cement, etc. Crystalline silica is regulated under "Designated Substances" *O.Reg 490/09,* as amended, of the *Occupational Health and Safety Act* as a Designated Substance.

.2 Silica dust can be generated through such processes as blasting, grinding, crushing, and sandblasting silica-containing material. Since silica is presumed present in concrete, ceiling tiles and drywall within the project area, appropriate respiratory protection and ventilation must be donned during the demolition, and modifications of these structures.

.3 The Occupational Health and Safety Branch of the MoL has published the document entitled "*Guideline: Silica on Construction Projects*". This document classifies the disturbance of materials containing silica as Type 1, Type 2 or Type 3 work, and assigns different levels of respiratory protection and work procedures for each classification. These

work procedures should be followed when performing work involving the disturbance of silica-containing materials.

6. POLYCHLORINATED BIPHENYLS (PCBs) (NOT RECOGNIZED AS A DESIGNATED SUBSTANCE)

.1 PCBs are not recognized as Designated Substances. However, a survey of the project area was completed for this substance due to its risks to both health and environment. It was not feasible during the survey to determine whether light fixture ballasts in the project area were free of PCBs. Therefore, if any fluorescent light ballasts are removed during this project, please refer to the Environmental Canada, *Identification of Lamp Ballasts Containing PCBs, August 1991* report in order to identify the ballast type. Ballasts for a typical 1.2 metre fluorescent light fixture made with PCBs contain approximately 23.6 grams of PCB.

.2 If any fluorescent light ballasts, are removed during any future renovations, they must be sorted by a licensed electrician.

PCB-containing equipment must be disposed of in accordance with:

-Canadian Environmental Protection Act's *(CEPA) PCB Regulations*

-Canadian Council of Ministers of the Environment's "*Guidelines for the Management of Wastes Containing Polychlorinated Biphenyls*

–Ontario Environmental Protection Act's *O.Reg 362/90* "*Waste Management – PCB's*" as amended (*O.Reg 33/07*)

All PCB-containing equipment that is removed from the site or placed into storage shall be appropriately reported in accordance with the requirements of the CEPA PCB Regulations.

7. OZONE DEPLETING SUBSTANCES (ODSs) (NOT RECOGNIZED AS A DESIGNATED SUBSTANCE)

.1 When halocarbons-containing equipment requires dismantling or disposal, this equipment must be tagged by a certified technician before it can be dismantled or disposed, as per section 10 of the Refrigerants Regulations 189/94 under the Ontario Environmental Protection Act and the Federal Halocarbon Regulations 2003. If the units are to be removed, no release of the refrigerant shall occur in accordance with the Canadian Environmental Protection Act. If the units are being disposed, a qualified ODS technician with environmental awareness training must

drain and remove the ODSs. ODS recycling and recovery initiatives must be undertaken for any ODS-containing units being displaced by proposed work.

.2 The Ozone-Depleting Substances (ODS) Regulations made under the Canadian Environmental Protection Act came into force on June 2, 1994. These regulations control the reclamation, recovery and recycling of ODSs. Environment Canada has prepared a Code of Practice for the Reduction of Chlorofluorocarbon Emissions from Refrigeration and Air Conditioning Systems (1991) which outlines practices to be followed when conducting maintenance on these refrigerant-containing units. The Federal Halocarbon Regulation which came into effect in 1999, regulates releases, recovery and recycling of ODS and their halocarbon alternatives in the federal domain and also to ensure that these releases are minimized. Even though halocarbon alternatives to ODSs may have no impact on the ozone layer, they are green house gases and thus contribute to climate change. The Regulations ensure that actions are taken to prevent releases of ODS and their halocarbon alternatives; to report these releases; that adequate training is provided to personnel; that operational and emergency procedures and strategic plans are developed for the use, control and phase-out of these substances. During this project, these regulations must be followed when dealing with ODSs.

8. OTHER HAZARDOUS MATERIALS (NOT RECOGNIZED AS DESIGNATED SUBSTANCES)

.1 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 renovation operations, they should be disposed of appropriately. The transport and disposal of chemical waste is governed by O. Reg. 347/90 – General – Waste Management, as amended.

.2 Propane tanks, and any contents, should be handled and disposed of appropriately.

.3 The transport and disposal of soot waste is governed by the Transportation of Dangerous Goods Act, and O. Reg. 347/90 – General – Waste Management, as amended. 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.

.4 Due to the health threat of microbials associated with fecal matter, it is recommended that prior to disturbance, 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.

.5 If CHP Distribution Tunnel pipes are to be disturbed by workers during the CHP Decommissioning project, workers should be notified of the presence of suspect mould and appropriate Personal Protective Equipment (PPE) (e.g. respiratory and dermal protection) may be required.

9. CONTRACTORS DUTIES

The contractor must review the designated substances report and take the necessary precautions to protect the health and safety of the workers and the environment. As per Section 30(4) of the *Ontario Occupational Health and Safety Act*, the party hiring the contractor (i.e., Departmental Representative) shall ensure that the contractor and subcontractor (if any) for the project has received a copy of the designated substance report prior to entering a binding contract for the supply of work on the project. As per Section 27(2) (a, b, and c) of the *Ontario Occupational Health and Safety Act*, while onsite, the contractor supervisor shall exercise every reasonable precaution for the protection of a worker. If you have any questions about the designated substance report, please contact the Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE

.1 Schedule and administer meetings throughout the progress of the work and at the call of Departmental Representative.

.2 Prepare and distribute agenda for meetings.

.3 Distribute written notice of each meeting three days in advance of meeting date to Departmental Representative and all invited parties.

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

.7 Reproduce and distribute copies of minutes within two days after meetings and transmit to meeting participants and, affected parties not in attendance, and Departmental Representative.

.8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

.1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors to be in attendance.

.3 Agenda to include:

.1 Appointment of official representative of participants in the Work.
.2 Schedule of Work: in accordance with Section 01 32 16.06 - Construction Progress Schedules - Critical Path Method.
.3 Schedule of submission of shop drawings and submittals. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
.4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, and fences in accordance with Section 01 52 00 - Construction Facilities.
.5 Delivery schedule of specified equipment in accordance with Section 01 32 16.06 - Construction Progress Schedules - Critical Path Method.
.6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
.7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
.8 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
.9 Take-over procedures, acceptance in accordance with Section 01 78 00 - Closeout Submittals.
.10 Monthly progress claims, administrative procedures, photographs, hold backs.
.11 Appointment of inspection and testing agencies or firms.
.12 Insurances, transcript of policies.
.13 Other business.

1.3 PROGRESS MEETINGS

.1 During course of Work, schedule progress meetings biweekly.

.2 Agenda to include the following:

- .1 Review, approval of minutes of previous meeting.
- .2 Review of Work progress since previous meeting.
- .3 Field observations, problems, conflicts.
- .4 Problems which impede construction schedule.
- .5 Corrective measures and procedures to regain projected schedule.
- .6 Revision to construction schedule.
- .7 Progress schedule, during succeeding work period.
- .8 Review submittal schedules: expedite as required.
- .9 Maintenance of quality standards.
- .10 Review proposed changes for affect on construction schedule and on completion date.
- .11 Other business.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Actual Finish Date (AF): point in time that Work actually ended on activity

.3 Actual Start Date (AS): point in time that Work actually started on activity.

.4 Bar Chart (Gantt chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars.

.5 Baseline: original approved plan (for Project, work package, or activity), plus or minus approved scope changes.

.6 Completion Milestones: they are firstly Interim Certificate and secondly Final Certificate.

.7 Constraint: applicable restriction that will affect performance of Project. Factors that affect activities can be scheduled.

.8 Control: process of comparing actual performance with planned performance, analyzing variances, evaluating possible alternatives, and taking appropriate corrective action as needed.

.9 Critical Activity: any activity on a critical path. Most commonly determined by using critical path method.

.10 Critical Path: series of activities that determines duration of Project. In deterministic model, critical path is usually defined as those activities with float less than or equal to specified value, often zero. It is longest path through Project.

.11 Critical Path Method (CPM): network analysis technique used to predict Project duration by analyzing which sequence of activities (which path) has least amount of scheduling flexibility (least amount of float).

.12 Data Date (DD) : date at which, or up to which, Project's reporting system has provided actual status and accomplishments.

.13 Duration (DU): number of work periods (not including holidays or other non-working periods) required to complete activity or other Project element. Usually expressed as workdays or work weeks.

.14 Early Finish Date (EF): in critical path method, earliest possible point in time on which uncompleted portions of activity (or Project) can finish, based on network logic and schedule constraints. Early finish dates can change as Project progresses and changes are made to Project plan.

.15 Early Start Date (ES): in critical path method, earliest possible point in time on which uncompleted portions of activity (or Project) can start, based on network logic and schedule constraints. Early start dates can change as Project progresses and changes are made to Project Plan.

.16 Finish Date: point in time associated with activity's completion. Usually qualified by one of following: actual, planned, estimated, scheduled, early, late, baseline, target, or current.

.17 Float: amount of time that activity may be delayed from its early start without delaying Project finish date. Float is mathematical calculation, and can change as Project progresses and changes are made to Project plan. This resource is available to both PWGSC and Contractor.

.18 Lag: modification of logical relationship that directs delay in successor task.

.19 Late Finish Date (LF): in critical path method, latest possible point in time that activity may be completed without delaying specified milestone (usually Project finish date).

.20 Late Start Date (LS): in critical path method, latest possible point in time that activity may begin without delaying specified milestone (usually Project finish date).

.21 Lead: modification of logical relationship that allows acceleration of successor task.

.22 Logic Diagram: see Project network diagram.

.23 Master Plan: summary-level schedule that identifies major activities and key milestones.

.24 Milestone: significant event in Project, usually completion of major deliverable.

.25 Monitoring: capture, analysis, and reporting of Project performance, usually as compared to plan.

.26 Near-Critical Activity: activity that has low total float.

.27 Non-Critical Activities: activities which when delayed, do not affect specified Contract duration.

.28 Project Control System: fully computerized system utilizing commercially available software packages.

.29 Project Network Diagram: schematic display of logical relationships of Project activities. Always drawn from left to right to reflect Project chronology.

.30 Project Plan: formal, approved document used to guide both Project execution and Project control. Primary uses of Project plan are to document planning assumptions and decisions, facilitate communication among stakeholders, and document approved scope, cost, and schedule baselines. Project plan may be summary or detailed.

.31 Project Planning: development and maintenance of Project Plan.

.32 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of Project Work in relation to established milestones.

.33 Project Schedule: planned dates for performing activities and planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy project objectives. Monitoring and control process involves using project schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.34 Quantified days duration: working days based on 5 day work week, discounting statutory holidays.

.35 Risk: uncertain event or condition that, if it occurs, has positive or negative effect on Project's objectives.

.36 Scheduled Finish Date (SF): point in time that Work was scheduled to finish on activity. Scheduled finish date is normally within range of dates delimited by early finish date and late finish date.

.37 Scheduled Start Date (SS): point in time that Work was scheduled to start on activity. Scheduled start date is normally within range of dates delimited by early start date and late start date.

.38 Start Date: point in time associated with activity's start, usually qualified by one of following: actual, planned, estimated, scheduled, early, late, target, baseline, or current.

.39 Work Breakdown Structure (WBS): deliverable-oriented grouping of project elements that organizes and defines total Work scope of Project. Each descending level represents increasingly detailed definition of Project Work.

1.2 SYSTEM DESCRIPTION

.1 Construction Progress Schedule (Project Time Management): describes processes required to ensure timely completion of Project. These processes ensure that various elements of Project are properly coordinated. It consists of planning, time estimating, scheduling, progress monitoring and control.

.2 Planning: this is most basic function of management, that of determining presentation of action and is essential.

- .1 It involves focusing on objective consideration of future, and integrating forward thinking with analysis; therefore, in planning, implicit assumptions are made about future so that action can be taken today.
- .2 Planning and scheduling facilitates accomplishment of objectives and should be considered continuous interactive process involving planning, review, scheduling, analysis, monitoring and reporting.

.3 Ensure that planning process is iterative and results in generally top-down processing with more detail being developed as planning progresses, and decisions concerning options and alternatives are made. This implies progressively more reliability of scheduling data. Detail Project schedule is used for analysis and progress monitoring.

.4 Ensure project schedule efficiencies through monitoring.

- .1 When activities begin on time and are performed according to estimated durations without interruptions, original Critical Path will remain accurate. Changes and delays will however, create an essential need for continual monitoring of Project activities.
- .2 Monitor progress of Project in detail to ensure integrity of Critical Path, by comparing actual completions of individual activities with their scheduled completions, and review progress of activities that has started but are not yet completed.
- .3 Monitoring should be done sufficiently often so that causes of delays are immediately identified and removed if possible.

.5 Project monitoring and reporting: as Project progresses, keep team aware of changes to schedule, and possible consequences. In addition to Bar Charts and CPM networks,

use narrative reports to provide advice on seriousness of difficulties and measures to overcome them.

.1 Narrative reporting begins with statement on general status of Project followed by summarization of delays, potential problems, corrective measures and Project status criticality.

1.3 CPM REQUIREMENTS

.1 Ensure Master Plan and Detail Schedule are practical and remain within specified Contract duration.

.2 Master Plan and Detail Schedule deemed impractical by Departmental Representative are revised and resubmitted for approval.

.3 Acceptance of Master Plan and Detail Schedule showing scheduled Contract duration shorter than specified Contract duration does not constitute change to Contract. Duration of Contract may only be changed through bilateral Agreement.

.4 Consider Master Plan and Detail Schedule deemed practical by Departmental Representative showing Work completed in less than specified Contract duration, to have float.

.5 First Milestone on Master Plan and Detail Schedule will identify start Milestone with an "ES" constraint date equal to Award of Contract date.

.6 Calculate dates for completion milestones from Plan and Schedule using specified time periods for Contract.

.7 Interim Certificate with "LF" constraint equal to calculated date.

.8 Calculations on updates to be such that if early finish of Interim Certificate falls later than specified Contract duration then float calculation to reflect negative float.

.9 Delays to non-critical activities, those with float may not be basis for time extension.

.10 Do not use float suppression techniques such as software constraints, preferential sequencing, special lead/lag logic restraints, extended activity times or imposed dates other than required by Contract.

.11 Allow for and show Master Plan and Detail Schedule adverse weather conditions normally anticipated. Specified Contract duration has been predicated assuming normal amount of adverse weather conditions.

.12 Provide necessary crews and manpower to meet schedule requirements for performing Work within specified Contract duration. Simultaneous use of multiple crews on multiple fronts on multiple critical paths may be required.

.13 Arrange participation on and off site of subcontractors and suppliers, as required by Departmental Representative for purpose of network planning, scheduling, updating and progress monitoring. Approvals by Departmental Representative of original networks and revisions do not relieve Contractor from duties and responsibilities required by Contract.

.14 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit to Departmental Representative Project Control System for planning, scheduling, monitoring and reporting of project progress.

.3 Include costs for execution, preparation and reproduction of schedule submittals in bid documents.

.4 Submit letter ensuring that schedule has been prepared in co-ordination with major sub-contractors.

.5 Refer to article "Progress monitoring and reporting" of this specification Section for frequency of Project control system submittals.

.6 Submit Project planning, monitoring and control system data as part of initial schedule submission and monthly status reporting in following form.

.1 Diskette or CD files in original scheduling software containing schedule and cash flow information, labelled with data date, specific update, and person responsible for update.

.2 Master Plan Bar Chart.

.3 Construction Detail schedule Bar Chart.

.4 Listing of project activities including milestones and logical connectors, networks (sub-networks) from Project start to end. Sort activities by activity identification number and accompany with descriptions. List early and late start and finish dates together with durations, codes and float.

.5 Criticality report listing activities and milestones with negative, zero and up to 5 days total float used as first sort for ready identification of critical or near critical paths through entire project. List early and late starts and finishes dates, together with durations, codes and float for critical activities.

.6 Progress report in early start sequence, listing for each trade, activities due to start, underway, or finished within two months from monthly update date. List activity identification number, description and duration. Provide columns for entry of actual start and finish dates, duration remaining and remarks concerning action required.

1.5 QUALITY ASSURANCE

.1 Use experienced personnel, fully qualified in planning and scheduling to provide services from start of construction to Final Certificate, including Commissioning.

1.6 PROJECT MEETING

.1 Meet with Departmental Representative within 10 working days of Award of Contract date, to establish Work requirements and approach to project construction operations.

1.7 WORK BREAKDOWN STRUCTURE (WBS)

.1 Prepare construction Work Breakdown Structure (WBS) within 10 working days of Award of Contract date. Develop WBS through at least five levels: Project, stage, element, sub-element and work package.

1.8 MASTER PLAN

.1 Structure and base CPM construction networks system on WBS coding in order to ensure consistency throughout Project.

.2 Prepare comprehensive construction Master Plan (CPM logic diagram) and dependent Cash Flow Projection within 10 working days of finalizing Agreement to confirm validity or alternates of identified milestones.

.1 Master Plan will be used as baseline.

.1 Revise baseline as conditions dictate and as required by Departmental Representative.

.2 Departmental Representative will review and return revised baseline within 10 work days.

.3 Reconcile revisions to Master Plan and Cash Flow Projections with previous baseline to provide continuous audit trail.

.4 Initial and subsequent Master Plans will include:

.1 Diskette or CD containing schedule and cash flow information, clearly labelled with data date, specific update, and person responsible for update.

.2 Bar chart identifying coding, activity durations, early/late and start/finish dates, total float, completion as percentile, current status and budget amounts.

.3 Network diagram showing coding, activity sequencing (logic), total float, early/late dates, current status and durations.

.4 Actual/projected monthly cash flow: expressed annually and monthly and shown in both graphical and numerical form.

1.9 DETAIL SCHEDULE

.1 Provide detailed project schedule (CPM logic diagram) within 10 working days of Award of Contract date showing activity sequencing, interdependencies and duration estimates. Include listed activities as follows:

.1 Shop drawings.
.2 Samples.
.3 Approvals.
.4 Procurement.
.5 Abatement of designated substances and hazardous materials.
.6 Deconstruction
.7 Construction.
.8 Installation.
.9 Site works.
.10 Testing.
.11 Commissioning and acceptance.

.2 Detail CPM schedule to cover in detail the full contract period with each activity duration approximately 5 days.

.1 Show remaining activities for CPM construction network system up to Final Certificate and develop complete detail as project progresses.

.2 Detail activities completely and comprehensively throughout duration of project.

.3 Relate Detail Schedule activities to basic activities and milestones developed and approved in Master Plan.

.4 Clearly show sequence and interdependence of construction activities and indicate:

.1 Start and completion of all items of Work, their major components, and interim milestone completion dates.

.2 Activities for procurement, delivery, installation and completion of each major piece of equipment, materials and other supplies, including:

.1 Time for submittals, re-submittals and review.

.2 Interdependence of procurement and construction activities.

.3 Include sufficient detail to assure adequate planning and execution of Work. Activities should generally range in duration from 3 to 15 workdays each.

.5 Provide level of detail for project activities such that sequence and interdependency of Contract tasks are demonstrated and allow co-ordination and control of project activities. Show continuous flow from left to right.

.6 Ensure activities with no float are calculated and clearly indicated on logical CPM construction network system as being, whenever possible, continuous series of activities throughout length of Project to form "Critical Path". Increased number of critical activities is seen as indication of increased risk.

.7 Insert Change Orders in appropriate and logical location of Detail Schedule. After analysis, clearly state and report to Departmental Representative for review effects created by insertion of new Change Order.

1.10 REVIEW OF THE CONSTRUCTION DETAIL SCHEDULE

.1 Allow 5 work days for review by Departmental Representative of proposed construction Detail Schedule.

.2 Upon receipt of reviewed Detail Schedule make necessary revisions and resubmit to Departmental Representative for review within 5 work days.

.3 Promptly provide additional information to validate practicability of Detail Schedule as required by Departmental Representative.

.4 Submittal of Detail Schedule indicates that it meets Contract requirements and will be executed generally in sequence.

1.11 COMPLIANCE WITH DETAIL SCHEDULE

.1 Comply with reviewed Detail Schedule.

.2 Proceed with significant changes and deviations from scheduled sequence of activities that cause delay, only after written receipt of approval by Departmental Representative.

.3 Identify activities that are behind schedule and causing delay. Provide measures to regain slippage.

.1 Corrective measures may include:

.1 Increase of personnel on site for effected activities or work package.

.2 Increase in materials and equipment.

.3 Overtime work and additional work shifts.

.4 Submit to Departmental Representative justification, project schedule data and supporting evidence for approval of extension to Contract completion date or interim milestone date when required. Include as part of supporting evidence:

.1 Written submission of proof of delay based on revised activity logic, duration and costs, showing time impact analysis illustrating influence of each change or delay relative to approved contract schedule.

.2 Prepared schedule indicating how change will be incorporated into the overall logic diagram. Demonstrate perceived impact based on date of occurrence of change and include status of construction at that time.

.3 Other supporting evidence requested by Departmental Representative

.4 Do not assume approval of Contract extension prior to receipt of written approval from Departmental Representative

.5 In event of Contract extension, display in Detail Schedule that scheduled float time available for work involved has been used in full without jeopardizing earned float.

.1 Departmental Representative will determine and advise Contractor number of allowable days for extension of Contract based on project schedule updates for period in question, and other factual information.

.2 Construction delays affecting project schedule will not constitute justification for extension of contract completion date.

1.12 PROGRESS MONITORING AND REPORTING

.1 On ongoing basis, Detail Schedule on job site must show "Progress to Date". Arrange participation on and off site of subcontractors and suppliers, as, and when necessary, for purpose of network planning, scheduling, updating and progress monitoring. Inspect Work with Departmental Representative at least once monthly to establish progress on each current activity shown on applicable networks.

.2 Update and reissue project Work Breakdown Structure and relevant coding structures as project develops and changes.

.3 Perform Detail Schedule update monthly with status dated (Data Date) on last working day of month. Update to reflect activities completed to date, activities in progress, logic and duration changes.

.4 Do not automatically update actual start and finish dates by using default mechanisms found in project management software.

.5 Submit to Departmental Representative copies of updated Detail Schedule.

.6 Requirements for monthly progress monitoring and reporting are basis for progress payment request.

.7 Submit monthly written report based on Detail Schedule, showing Work to date performed, comparing Work progress to planned, and presenting current forecasts. Report must summarize progress, defining problem areas and anticipated delays with respect to Work schedule, and critical paths. Explain alternatives for possible schedule recovery to mitigate any potential delay. Include in report:

.1 Description of progress made.

.2 Pending items and status of: permits, shop drawings, Change Orders, possible time extensions.

.3 Status of Contract completion date and milestones.

.4 Current and anticipated problem areas, potential delays and corrective measures.

.5 Review of progress and status of Critical Path activities.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data and samples in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify that field measurements and affected adjacent Work are coordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative’s review.

.10 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Submit shop drawings bearing stamp and signature of qualified professional Engineer registered or licensed in Ontario.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow ten days for Departmental Representative's review of each submission.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in shop drawings as Departmental Representative may require, consistent

with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter, in duplicate, containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.8 Submissions include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.9 After Departmental Representative's review, distribute copies.

.10 Submit six copies and an electronic copy in .pdf format for each document requested in specification Sections and as Departmental Representative may reasonably request.

.11 Delete information not applicable to project.

.12 Do not annotate documents by pencil, highlighter, blue pen or other markings which do not clearly reproduce by photocopying.

.13 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, six copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copies will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.14 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept.
- .1 This review shall not mean that PWGSC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of

construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.3 PROGRESS PHOTOGRAPHS

.1 Submit progress photographs weekly to Departmental Representative to document progress.

.2 Submit eight photographs from the cardinal compass points showing the full expanse of site. Use the same camera angle from week to week.

.3 Submit eight other photographs showing details of specific work elements.

.4 Submit photographs in digital format, using .jpg files, 1024 x 768 image size, minimum 350 KB file size. File name to include date. Submit within 24 hours.

.5 During course of project photographs may be emailed to Departmental Representative. At end of project provide CD ROM with all images to Departmental Representative.

1.4 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

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

.3 Province of Ontario
- .1 Occupational Health and Safety Act, R.S.O. 1990 Updated 2012-07-07.
- .2 Confined Space Regulation (O. Reg. 632/05).

1.2 SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
- .1 Results of site specific safety hazard assessment.
- .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 Submit copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative within 24 hours of inspection.

.4 Submit copies of reports or directions issued by Federal, Provincial and Municipal health and safety inspectors to Departmental Representative within 24 hours of receipt.

.5 Submit copies of incident and accident reports within 24 hours of accident or incident.

.6 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.

.7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 10 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.

.8 Departmental Representative 's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

1.3 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work. Provide copy to Departmental Representative within 24 hours of filing.

1.4 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.5 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.6 REGULATORY REQUIREMENTS

.1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.7 PROJECT/SITE CONDITIONS

.1 Work at site will involve contact with:
- .1 Asbestos
- .2 Mould
- .3 Lead
- .4 Silica
- .5 Mercury
- .6 Polychlorinated Biphenyl
- .7 Halocarbons
- .8 Miscellaneous: various lubrication and treatment chemicals, waste oil drums, exterior propane tanks, soot, rodent droppings.

1.8 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.9 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.10 COMPLIANCE REQUIREMENTS

.1 Comply with the Occupational Health and Safety Act.

.2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.11 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province and advise Departmental Representative verbally immediately and in writing within 24 hours.

1.12 HEALTH AND SAFETY COORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:
- .1 Have site-related working experience specific to activities associated with demolition and deconstruction.
- .2 Have working knowledge of occupational safety and health regulations.
- .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
- .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
- .5 Be on site during execution of Work.

1.13 POSTING OF DOCUMENTS	.1	Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province and Municipality, and in consultation with Departmental Representative.
1.14 CORRECTION OF NON-COMPLIANCE	.1	Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
	.2	Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
	.3	Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.
1.15 BLASTING AND EXPLOSIVES	.1	Blasting or other use of explosives is not permitted without prior receipt of written instruction by Departmental Representative.
1.16 POWDER ACTUATED DEVICES	.1	Use powder actuated devices only after receipt of written permission from Departmental Representative.
1.17 CONFINED SPACE	.1	Develop procedures for working in confined space.
	.2	Comply with the Confined Space Regulation (O. Reg. 632/05).
1.18 WORK STOPPAGE	.1	Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

PART 2 - PRODUCTS

2.1 NOT USED	.1	Not Used.

PART 3 - EXECUTION

3.1 NOT USED	.1	Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 DEFINITIONS

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2 SUBMITTALS

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

.2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.

.3 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.4 Environmental protection plan: include:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.

.3 Names and qualifications of persons responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.7 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.

.9 Spill control plan including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

.12 Contaminant prevention plan that: identifies potentially hazardous substances

to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

.14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

.15 Pesticide treatment plan: to be included and updated, as required.

1.3 EQUIPMENT .1 All equipment shall comply with Part III, Section 139 of the Ontario Occupational Safety and Health Act, 1990 (OSHA).

1.4 SPILL RESPONSE PLAN .1 Submit, for the Departmental Representative's review, a site-specific spill contingency/response plan prior to commencement of work on site.

.2 Maintain an emergency spill kit on site.

1.5 BIRD NESTING .1 Conduct a visual inspection of the work area to identify the presence of nesting birds prior to commencing work on site. Report findings to Departmental Representative. Obtain direction from Departmental Representative if nesting birds are present.

1.6 FIRES .1 Fires and burning of rubbish on site not permitted.

1.7 DISPOSAL OF WASTES .1 Do not bury rubbish and waste materials on site unless approved by Departmental Representative.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.8 DRAINAGE .1 Submit, for the Departmental Representative's review, a site-specific water management plan prior to commencement of work on site. Identify methods and procedures for management and discharge of wastewater (including dewatering) and stormwater.

.2 Submit, for the Departmental Representative's review, a site-specific erosion and sediment control plan prior to commencement of work on site. Identifiy type and location of erosion and sediment controls. Include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.3 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.4 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

.5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.9 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent lands where indicated.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and truckin lanes, and encase with protective wood framework from grade level to height of 2.0 m.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation.

.5 Restrict tree removal to areas indicated or designated by Departmental Representative.

1.10 POLLUTION CONTROL

.1 Submit, for the Departmental Representative's review, a site-specific air pollutant environmental management plan in accordance with *"Best practices for the Reduction of Air Emissions from Construction and Demolition Activities"* prior to commencement of work on site.

.2 Maintain pollution control features installed under this contract.

.3 Control emissions from equipment and plant to local authorities' emission requirements.

.4 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area, by providing temporary enclosures.

.5 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.6 Comply with City of Ottawa Idling Control By-law No. 2007-266.

.7 Comply with City of Ottawa Noise By-law No. 2004-253.

.8 Position heavy machinery and vehicles to minimize direct emission exposure to vegetation.

1.11 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection Plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

1.12 BIRD CONTROL

.1 Take measures to prevent birds from nesting within the Limit of Contract Area.

.2 Immediately upon start of the project install netting to prevent birds from entering the chimneys of the CHP and nesting. Keep in place until demolition is completed.

.3 Prior to the start of the spring nesting season install netting over trees adjacent the CHP to prevent birds from nesting. Keep in place until nesting season is over and then remove netting.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 02 42 13 - Deconstruction of Structures.

1.2 REFERENCES

.1 Federal Legislation
- .1 Canadian Environmental Protection Act, 1999, c. 33 (CEPA).
- .2 Canadian Environmental Assessment Act, 2012, c. 37 (CEAA).
- .3 Transportation of Dangerous Goods Act 1992, c. 34 (TDGA).
- .4 Motor Vehicle Safety Act 1993, c. 16 (MVSA).

1.3 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 to salvage materials for reuse. What cannot be reused is considered subsequently for recycling. Ultimate objective is to recover potentially valuable resources while diverting from landfill what has traditionally been significant portion of waste stream.

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

.4 Disassembly: physical detachment of materials from structure and may include: prying, pulling, cutting, unscrewing.

.5 Hauler: company (possessing appropriate and valid Certificate of Approval) contracted to transport waste, reusable or recyclable materials off site to designated facility, user or receiving organization.

.6 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: 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.

.7 Processing: tasks which are subsequent to disassembly and may include: moving materials, denailing, cleaning, separating and stacking.

.8 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse by others.

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

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

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

.12 Salvage: removal of structural and non-structural structure materials from industrial, commercial and institutional structure deconstruction/disassembly projects for purpose of reuse or recycling.

.13 Source Separation: acts of keeping different types of waste materials separate beginning from first time they become waste.

.14 Used Building Material Receipt: receipt issued at end destination for materials designated for alternate disposal.

.15 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying (by volume or weight) amounts of materials and wastes generated during deconstruction. Indicates quantities of reuse, recycling and landfill.

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

.17 Waste Reduction Workplan (WRW): written report which outlines actions to be taken to reduce, reuse and recycle materials during course of deconstruction. Actions based on finding of the Waste Audit (WA).

.18 Weigh Bill: receipt received from recycling facility indicating weight and content of each load/bin of material.

1.4 SUBMITTALS

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

.2 WMC is responsible for fulfillment of reporting requirements.

.3 Prior to start of Work on site, submit detailed Waste Audit indicating descriptions of and anticipated quantities of materials to be reused, recycled and landfilled in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal .

.4 Based on findings of Waste Audit submit Waste Reduction Workplan indicating schedule of selective demolition, material descriptions and quantities to be salvaged, number and location of bins, anticipated frequency of tippage, and names and addresses of haulers, facilities, and receiving organizations in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal .

.5 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.

.6 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.

.7 Keep copies of submittals on file for minimum of five years after completion of project.

.8 Prior to start of demolition and/or deconstruction work on site, submit a detailed survey, including photographs, of neighbouring buildings. Document all existing defects, failures, cracks, or evidence of structural movement. Secure the Departmental Representative's written acceptance of the survey. The survey will serve to identify, post demolition and/or deconstruction, any effect of the demolition and/or deconstruction on the neighbouring buildings.

.9 Prior to start of demolition and/or deconstruction work of the CHP on site, submit a detailed Deconstruction/Disassembly Plan. Identify the means and methods of deconstruction, disassembly and demolition. Where the means and methods affects the structural integrity and stability of the CHP, provide reports and/or drawings stamped and signed by a qualified professional Engineer or Architect registered or licensed in Ontario that demonstrate the means and methods. Secure the Departmental Representative's written acceptance of the Deconstruction/Disassembly Plan.

.10 Prior to start of deconstruction and/or decommissioning work for the TDS on site, submit a detailed Deconstruction/Disassembly Plan. Identify the means and methods of deconstruction, disassembly and decommisioning. Identify the means of filling the TDS with fill. Where the means and methods affects the structural integrity and stability of the TDS, provide reports and/or drawings stamped and signed by a qualified professional Engineer or Architect registered or licensed in Ontario that demonstrate the means and methods. Secure the Departmental Representative's written acceptance of the Deconstruction/Disassembly Plan.

1.5 DRAWINGS

.1 Where required by Authorities Having Jurisdiction, submit for approval drawings, diagrams and details showing sequence of demolition, deconstruction and decommissioning work, materials designated for salvage and support of structures and underpinning.

.2 Where required by Authorities Having Jurisdiction, submit drawings stamped and signed by qualified professional Engineer or Architect registered or licensed in Ontario.

1.6 QUALITY ASSURANCE

.1 Qualifications: provide adequate workforce training through meetings and demonstrations. Have someone on site with deconstruction experience throughout project for consultation and supervision purposes.

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

.3 Meetings: hold project meetings every second week.

.1 Ensure key personnel, site supervisor, project manager, subcontractor representatives, and WMC attend.

.2 WMC to provide written report on status of waste diversion and deconstruction activity at each meeting.

.3 Departmental Representative will provide written notification of any change to regular meeting schedule established upon contract award to Contractor 24 hours prior to scheduled meeting.

.4 Prepare minutes of meetings and distribute to all participants and Departmental Representative within 24 hours.

1.7 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 Base structures to be deconstructed on their condition at time of site visit during Bid period. Be responsible for provision of services required for deconstruction.

.2 Storage:
- .1 Store materials, salvaged for reuse and recycling, or designated for alternate disposal, in locations as outlined in Waste Reduction Workplan.
- .2 Maximum permitted duration of material storage on site 2 months after project completion.

1.8 ENVIRONMENTAL PROTECTION

.1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.

.2 Ensure deconstruction work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air noise pollution.

.3 Fires and burning of waste or materials is not permitted on site.

.4 Do not bury waste or materials on site unless approved in writing by Departmental Representative.

.5 Do not dispose of waste or volatile materials into watercourses, storm or sanitary sewers.
- .1 Ensure proper disposal procedures in accordance with CEPA, TDGA, and applicable Provincial and Municipal regulations.

.6 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties in accordance with Authorities Having Jurisdiction.

.7 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Authorities Having Jurisdiction and as directed by Departmental Representative.

.8 Protect trees, plants and foliage on site and adjacent lands where indicated.

.9 Prevent extraneous materials from contaminating air beyond deconstruction area, by providing temporary enclosures during Work.

.10 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on temporary roads.

.11 Employ reasonable means necessary, designate worker, hire security, and/or erect temporary fencing to protect salvaged materials from vandalism, theft, adverse weather, or inadvertent damage by heavy machinery.

.12 Use natural lighting to do Work where possible.
- .1 Shut off lighting except those required for security purposes at end of each day.

.13 Organize site and workers in manner which promotes efficient flow of materials through disassembly, processing, stockpiling, and removal.

1.9 SCHEDULING

.1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion. In event of unforeseen delay notify Departmental Representative in writing within 24 hours of onset of delay.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 SITE VERIFICATION OF CONDITIONS

.1 Investigate site and structures to determine dismantling, processing and storage logistics required prior to beginning of Work.

.2 Develop strategy for deconstruction to facilitate optimum salvage of reusable and recyclable materials.

3.2 PREPARATION

.1 Obtain and pay for necessary permits and approvals including Municipal Demolition Permit.

.1 Provide copies to Departmental Representative prior to start of Work on site.

.2 Post signs in visible locations, in English and French, to indicate to workers, subcontractors and haulers, location of processing, stockpiles of each material, bin locations and use e.g. ("CLEAN WOOD ONLY").

3.3 SELLING OF MATERIALS

.1 On-site selling of materials to the public is not permitted.

3.4 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.

END OF SECTION

PART 1 - GENERAL

1.1 TAXES

.1 Pay all taxes properly levied by law (including Federal, Provincial and Municipal).

1.2 FEES, PERMITS AND CERTIFICATES

.1 Pay all fees and obtain all permits. Provide authorities with drawing and information for acceptance certificates. Provide inspection certificates as evidence that work conforms to requirements of Authority Having Jurisdiction.

1.3 REFERENCES AND CODES

.1 Perform Work in accordance with National Building Code of Canada 2010 (NBC) and Ontario Building Code 2012 (OBC), including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:
- .1 Contract documents.
- .2 Specified standards, codes and referenced documents.

1.4 MATERIALS

.1 Materials shall be new and work shall conform to the minimum applicable standards of the "References" indicated in the specification sections, the NBC, the OBC, and all applicable Provincial and Municipal codes. In the case of conflict or discrepancy the most stringent requirement shall apply.

1.5 HAZARDOUS MATERIAL DISCOVERY

.1 Stop work immediately when material resembling spray or trowel-applied asbestos, Polychlorinated Biphenyl (PCB), mould or other designated substances or hazardous substances are encountered during the work. Take preventative measures and promptly notify Departmental Representative. Do not proceed until written instructions have been received from Departmental Representative.

1.6 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions and municipal by-laws.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 INSPECTION

.1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.2 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

1.3 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work and off-site disposal and recycling facilities.

.2 Co-operate to provide reasonable facilities for such access.

1.4 PROCEDURES

.1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.5 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.6 REPORTS

.1 Submit 4 copies of inspection and test reports to Departmental Representative.

.2 Provide copies to subcontractor of work being inspected or tested.

1.7 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

.2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 SUBMITTALS

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

1.2 INSTALLATION AND REMOVAL

.1 All existing services, including power, water, natural gas and telecommunications, serving the CHP and TDS will be terminated by PWGSC prior to takeover by the Contractor.

.2 Provide and pay for temporary utilities.

.3 Remove from site all such work after use.

1.3 DEWATERING

.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.4 WATER SUPPLY

.1 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.

1.5 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required during Work, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be flameless type. Solid fuel salamanders are not permitted.

.3 Provide temporary heat and ventilation in enclosed areas as required to:

.1 Facilitate progress of Work.

.2 Provide adequate ventilation to meet health regulations for safe working environment.

.4 Ventilating:

.1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during Work.

.2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.

.3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

.4 Ventilate storage spaces containing hazardous or volatile materials.

.5 Ventilate temporary sanitary facilities.

.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.5 Pay costs for maintaining temporary ventilation and heat.

.6 Maintain strict supervision of operation of temporary heating and ventilating equipment to:

.1 Conform to applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of services.

.4 Prevent damage.

.5 Vent direct-fired combustion units to outside.

.7 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.6 TEMPORARY POWER AND LIGHT	.1	Provide and pay for temporary power during construction for temporary lighting and operating of power tools.
	.2	Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
	.3	Provide and maintain temporary lighting throughout project.
1.7 TEMPORARY COMMUNICATION FACILITIES	.1	Provide and pay for temporary telephone, fax, internet hook up, lines and equipment necessary for own use.
1.8 FIRE PROTECTION	.1	Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.

PART 2 - PRODUCTS

2.1 NOT USED	.1	Not Used.

PART 3 - EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL	.1	Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent lands, properties and walkways, according to requirements of Authorities Having Jurisdiction.
	.2	Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
	.3	Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)
- .1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA-0121-M1978 (R2003), Douglas Fir Plywood.
- .3 CSA-Z321-96 (R2006), Signs and Symbols for the Occupational Environment.
- .4 CSA Z797-09, Code of Practice for Access Scaffold.

1.2 SUBMITTALS

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

1.3 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Identify areas which have to be gravelled to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

.4 Provide construction facilities in order to execute work expeditiously.

.5 Remove from site all such work after use.

1.4 SCAFFOLDING

.1 Scaffolding in accordance with CSA Z797.

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs.

1.5 HOISTING

.1 Provide, operate and maintain hoists or cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.

.2 Hoists and cranes to be operated by qualified operator.

1.6 SITE STORAGE/LOADING

.1 Confine storage, loading, work and operations to within the Limit of Contract Area. Obtain and pay for use of additional storage or work areas needed.

.2 Do not unreasonably encumber site with construction waste, materials or equipment.

.3 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.7 CONSTRUCTION PARKING

.1 Parking is not permitted on the CEF except within the Limit of Contract Area.

.2 Obtain and pay for use of additional parking needed.

1.8 SECURITY

.1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.9 OFFICES

.1 Provide office heated to 22°C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.

.2 Provide marked and fully stocked first-aid case in a readily available location.

.3 Subcontractors to provide their own offices as necessary. Direct location of these offices.

1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.11 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

.3 While existing services are in place, the existing building sanitary facilities may be used.

1.12 CONSTRUCTION SIGNAGE

.1 Provide bilingual directional way-finding signage for the public to direct them to Public Parking Areas from Prince of Wales Drive and to the Canada Agriculture Museum Buildings from the Public Parking Areas. Submit signage plan to Departmental representative for approval.

.2 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.

.3 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.

1.13 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Summit, prior to commencement of Work on site, for the Departmental Representative's review, a detailed Traffic Management Plan (TMP). Identify signage, public vehicular and pedestrian traffic flow, public parking, construction vehicle traffic flow, construction parking. Describe how traffic will be managed over the course of the Work. Revise as needed to secure Departmental Representative's written approval.

.1 Show TMP for each phase of work.

.2 Utilize graphics, site plans and aerial photographs to clearly describe the TMP to lay people.

.3 Produce the TMP in English and French for public circulation.

.2 Provide access and temporary relocated roads as necessary to maintain traffic.

.3 Maintain and protect traffic on affected roads during Work.

.4 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

.5 Protect travelling public from damage to person and property.

.6 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.7 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.8 Construct access and haul roads necessary.

.9 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.

.10 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.11 Dust control: adequate to ensure safe operation at all times.

.12 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.

.13 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.

.14 Provide snow removal during period of Work.

.15 Remove haul roads upon completion of Work.

1.14 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

PART 1 - GENERAL

1.1 INSTALLATION AND REMOVAL	.1	Provide temporary controls in order to execute Work expeditiously.
	.2	Remove from site all such work after use.
1.2 FENCING	.1	Erect temporary fence to enclose site using prefabricated panels formed of galvanized steel mesh and tubing complete with supports and connectors.
	.2	Fence minimum 1.8 m high.
	.3	Fence sections anchored and joined to prevent human access.
	.4	Provide gates at roadways. Equip gates with locks and keys.
	.5	Provide fencing around trees and plants designated to remain to protect from damage by equipment and construction procedures.
1.3 GUARD RAILS AND BARRICADES	.1	Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, and open edges of floors and roofs.
	.2	Provide as required by Authorities Having Jurisdiction.
1.4 WEATHER ENCLOSURES	.1	Provide weather tight closures to facilitate Work.
	.2	Design enclosures to withstand wind pressure and snow loading.
1.5 DUST TIGHT SCREENS	.1	Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers and public.
	.2	Maintain and relocate protection until such work is complete.
1.6 ACCESS TO SITE	.1	Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.
1.7 PUBLIC TRAFFIC FLOW	.1	Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.
1.8 FIRE ROUTES	.1	Maintain access to site including overhead clearances for use by emergency response vehicles.
1.9 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY	.1	Protect surrounding private and public property from damage during performance of Work.
	.2	Be responsible for damage incurred.
1.10 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.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Within text of each specifications section, reference may be made to reference standards.

.2 Upon request, and within 5 days, provide a copy of any cited reference to the Departmental Representative.

.3 Conform to these reference standards, in whole or in part as specifically requested in specifications.

.4 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.

.5 Cost for such testing will be borne by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 QUALITY

.1 Products, materials and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity for any particular or like item throughout Work.

1.3 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth.

.5 Store lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.6 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

1.4 TRANSPORTATION

.1 Pay costs of transportation of products and removed materials required in performance of Work.

1.5 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.6 QUALITY OF WORK

.1 Carry out work using qualified licenced workers or apprentices in accordance with Provincial Act respecting manpower vocational training and qualification.

.2 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licenced workers.

.3 Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.

.4 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

.5 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

.6 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.7 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination of deconstruction work.

1.8 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.9 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by Authority Having Jurisdiction. Stake and record location of capped service.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES	.1	Departmental Representative's identification of existing survey control points and property limits.
1.2 QUALIFICATIONS OF SURVEYOR	.1	Qualified registered land surveyor, licensed to practice in Ontario.
1.3 SURVEY REFERENCE POINTS	.1	Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
	.2	Make no changes or relocations without prior written notice to Departmental Representative.
	.3	Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
	.4	Require surveyor to replace control points in accordance with original survey control.
1.4 SURVEY REQUIREMENTS	.1	Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
	.2	Establish lines and levels, locate and lay out, by instrumentation.
	.3	Stake for grading, fill and topsoil placement and landscaping features.
	.4	Stake slopes and berms.
	.5	Document existing capped underground services including type, material, size and invert elevations.
	.6	Document existing pile caps including, location, size and elevation.
1.5 EXISTING SERVICES	.1	Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.
	.2	Remove abandoned service lines within 2 m of main branch or as indicated. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.
1.6 RECORDS	.1	Maintain a complete, accurate log of control and survey work as it progresses.
	.2	Record locations of maintained, re-routed and abandoned service lines.
1.7 SUBMITTALS	.1	Submit name and address of Surveyor to Departmental Representative.
	.2	On request of Departmental Representative, submit documentation to verify accuracy of field work.

.3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit written request in advance of cutting or alteration which affects:
- .1 Structural integrity of elements of project. .
- .2 Efficiency, maintenance, or safety of operational elements.
- .3 Visual qualities of sight-exposed elements.
- .4 Work of Owner or separate contractor.

.3 Include in request:
- .1 Identification of project.
- .2 Location and description of affected Work.
- .3 Statement on necessity for cutting or alteration.
- .4 Description of proposed Work, and products to be used.
- .5 Alternatives to cutting and patching.
- .6 Effect on Work of Owner or separate contractor.
- .7 Written permission of affected separate contractor.
- .8 Date and time work will be executed.

1.2 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

1.3 CUT, PATCH AND MAKE GOOD

.1 Cut existing surfaces as required to accommodate new work.

.2 Remove all items so shown or specified.

.3 Patch and make good surfaces cut, damaged or disturbed, to Departmental Representative's approval. Match existing material, colour, finish and texture.

1.4 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

1.5 EXECUTION

.1 Execute cutting, fitting, and patching, including excavation and fill, to complete Work.

.2 Fit several parts together, to integrate with other Work.

.3 Uncover Work to install ill-timed Work.

.4 Remove and replace defective and non-conforming Work.

.5 Remove samples of installed Work for testing.

.6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.8 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

.10 Restore work with new products in accordance with requirements of Contract Documents.

.11 Re-grade surfaces to match adjacent grades: Refinish continuous surfaces to nearest intersection.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.2 Unless otherwise specified, materials for removal become the Contractor's property and shall be taken from site.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.3 Clear snow and ice from access to building, bank/pile snow in designated areas only.

.4 Make arrangements with and obtain permits from Authorities Having Jurisdiction for disposal of waste and debris.

.5 Provide on-site containers for collection of waste materials and debris.

.6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.7 Dispose of waste materials and debris off site.

.8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.9 Provide adequate ventilation during use of volatile or noxious substances.

1.2 FINAL CLEANING

.1 When Work is substantially performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris other than that caused by Owner or other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative.

.6 Make arrangements with and obtain permits from Authorities Having Jurisdiction for disposal of waste and debris.

.7 Sweep and wash clean paved areas.

1.3 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.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 WASTE MANAGEMENT GOALS

.1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PWGSC's Waste Management Plan and Goals.

.2 PWGSC's Waste Management Goal is a minimum of 75 percent of total Project Waste to be diverted from landfill sites. Provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.

.3 Accomplish maximum control of solid deconstruction waste.

.4 Preserve environment and prevent pollution and environment damage.

1.2 RELATED SECTIONS

.1 Section 02 41 13 - Selective Site Demolition.

.2 Section 02 41 13.01 - Asphalt Pavement Removal.

.3 Section 02 42 13 - Deconstruction of Structures.

.4 Section 02 81 01- Hazardous Materials - CEF

.5 Section 02 82 00.01 - Asbestos Abatement - Minimum Precautions

.6 Section 02 82 00.02 - Asbestos Abatement - Intermediate Precautions

.7 Section 02 82 00.03 - Asbestos Abatement - Maximum Precautions

.8 Section 02 83 00 - Lead Abatement

.9 Section 02 84 00 - Polychlorinated Biphenyl Remediation

.10 Section 02 87 00 - Mercury Precautionary Measures

.11 Section 02 89 00 - Silica Precautionary Measures

1.3 DEFINITIONS

.1 Demolition Waste Audit (DWA): relates to actual waste generated from project.

.2 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

.3 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.

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

.5 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.

.6 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
- .1 Salvaging reusable materials from re-modelling 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.

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

.8 Separate Condition: refers to waste sorted into individual types.

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

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

.11 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials.

1.4 DOCUMENTS

.1 Maintain at job site, one copy of following documents:
- .1 Waste Audit.
- .2 Waste Reduction Workplan.
- .3 Material Source Separation Plan.

1.5 SUBMITTALS

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

.2 Prepare and submit following:
- .1 Waste Audit (WA)
- .2 Waste Reduction Workplan (WRW)
- .3 Demolition Waste Audit (DWA)
- .4 Materials Source Separation Program (MSSP) description.

.3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.
- .1 Failure to submit may result in hold back of final payment.
- .2 Provide receipts, scale tickets, waybills, and show quantities and types

of materials reused, recycled, co-mingled and separated off-site or disposed of.

.3 For each material reused, sold or recycled from project, include amount in tonnes, quantities by number or type and size of items and the destination.

.4 For each material land filled or incinerated from project, include amount in tonnes of material and identity of landfill or incinerator.

1.6 WASTE AUDIT (WA)

.1 Prior to conducting WA, provide draft spreadsheet template to Departmental Representative for approval of level of detail.

.2 Conduct WA prior to start of demolition.

.3 Record extent to which materials or products used consist of recycled or reused materials or products.

.4 WA to identify and categorize all waste under a heading "Material Category". These categories, as a minimum, will include: brick, concrete block, cast-in-place concrete, precast concrete, doors, electrical, HVAC, glazing, insulation, interior finishes, metals, plumbing, and wood.

.5 For each "Material Category" identify the following:

.1 Material Quantity Unit - the total quantity of material.

.2 Estimated Waste Percentage - the estimated percentage of material that is waste.

.3 Total Quantity of Waste - the product of Material Quantity Unit and Estimated Waste Percentage.

.4 Generation Point - the area in which the waste was generated.

.5 Percent Recycled - the total percentage of recycled material from Total Quantity of Waste.

.6 Percent Reused - the total percentage of reused material from Total Quantity of Waste.

1.7 WASTE REDUCTION WORKPLAN (WRW)

.1 Prior to conducting WRW, provide draft template to Departmental Representative for approval of level of detail.

.2 Conduct WRW prior to start of demolition.

.3 WRW should include but not limited to:

.1 Destination of materials listed.

.2 Deconstruction/disassembly techniques and sequencing.

.3 Schedule for deconstruction/disassembly.

.4 Locations for sorting.

.5 Security measures to prevent contamination.

.6 Protection.

.7 Clear labelling of sorting and / or storage areas.

.8 Details on materials handling and removal procedures.

.9 Estimated quantities of materials to be salvaged for reuse or recycled and materials sent to landfill.

.4 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.5 Describe management of waste.

.6 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.

.7 Post WRW or summary where workers at site are able to review content.

.8 WRW must target a minimum of 75 percent total waste diversion by either weight or volume.

.9 Monitor and report on waste reduction by documenting total weight and / or volume.

1.8 DEMOLITION WASTE AUDIT (DWA)

.1 DWA shall track the actual inventory of quantities of materials to be salvaged for reuse, recycling, or disposal against the WA to determine performance.

.2 Prior to conducting DWA, provide draft spreadsheet template to Departmental Representative for approval of level of detail.

.3 Maintain a current DWA as waste is processed. Provide a monthly report to the Departmental Representative.

.4 Provide final DWA within 30 days of completion of Work.

.5 Conduct WA prior to start of demolition.

.6 DWA to identify and categorize all waste under a heading "Material Category". These categories, as a minimum, will include: brick, concrete block, cast-in-place concrete, precast concrete, doors, electrical, HVAC, glazing, insulation, interior finishes, metals, plumbing, and wood.

.7 For each "Material Category" identify the following:

- .1 Material Quantity Unit - the total quantity of material generated
- .2 Actual Waste Percentage - the actual percentage of material that is waste.
- .3 Total Quantity of Waste - the product of Material Quantity Unit and Actual Waste Percentage.
- .4 Generation Point - the area in which the waste was generated.
- .5 Percent Recycled - the total percentage of actual recycled material from Total Quantity of Waste.
- .6 Percent Reused - the total percentage of actual reused material from Total Quantity of Waste.

1.9 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

.1 Prepare MSSP and have ready for use prior to project start-up.

.2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Departmental Representative.

.3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide containers to deposit reusable and recyclable materials.

.5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.6 Locate separated materials in areas which minimize material damage.

.7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.

.1 Transport to approved and authorized recycling facility or to users of material for recycling.

.8 Collect, handle, store on-site, and transport off-site, salvaged materials in combined condition.

.1 Ship materials to site operating under Certificate of Approval.

.2 Materials must be immediately separated into required categories for reuse or recycling.

1.10 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.

.2 Unless specified otherwise, materials for removal become Contractor's property.

.3 Protect, stockpile, store and catalogue salvaged items.

.4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.5 Protect structural components not removed for demolition from movement or damage.

.6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.

.7 Protect surface drainage, mechanical and electrical from damage and blockage.

.8 Separate and store materials produced during dismantling of structures in designated areas.

.9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
- .1 On-site source separation is recommended.
- .2 Remove co-mingled materials to off-site processing facility for separation.
- .3 Provide waybills for separated materials.

1.11 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of hazardous waste into waterways, storm, or sanitary sewers.

.3 Keep records of construction waste including:
- .1 Number and size of bins.
- .2 Waste type of each bin.
- .3 Total tonnage generated.
- .4 Tonnage reused or recycled.
- .5 Reused or recycled waste destination.

.4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

.5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.12 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises.

.2 Maintain security measures established by existing facility or provide temporary security measures approved by Departmental Representative.

1.13 SCHEDULING

.1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 APPLICATION

.1 Do Work in compliance with WRW.

.2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Clean-up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

3.3 DIVERSION OF MATERIALS

.1 Separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative, and consistent with applicable fire regulations.

- .1 Mark containers or stockpile areas.
- .2 Provide instruction on disposal practices.

.2 On-site sale of material is not permitted.

.3 Waste diversion rate must meet a minimum of 75 percent total waste diversion by either weight or volume.

END OF SECTION

PART 1 - GENERAL

1.1 SUBMITTALS

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

.2 Copy will be returned after Departmental Representative's inspection, with Departmental Representative's comments.

.3 Revise content of documents as required prior to final submittal.

1.2 RECORD DOCUMENTS

.1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to Contract.
- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.4 Keep record documents and samples available for inspection by Departmental Representative.

1.3 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of black line opaque drawings provided by Departmental Representative.

.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
- .1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
- .2 Field changes of dimension and detail.
- .3 Changes made by change orders.
- .4 Details not on original Contract Drawings.

.5 Specifications: mark each item to record actual construction, including:
- .1 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.4 FINAL SURVEY

.1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.5 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Departmental Representative for approval.

.3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.

.4 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.

.5 Respond in a timely manner to oral or written notification of required construction warranty repair work.

.6 Written verification will follow oral instructions. Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION