

PART 1 – GENERAL

1.1 REGULATORY REQUIREMENTS

.1 An investigation into the presence of designated substances for the Confederation Exterior Window Repairs at Confederation Building, 249 Wellington Street, Ottawa, Ontario, was performed in order to meet the requirements of the *Canada Labour Code* under Part II, section 124 which stipulates that every employer shall ensure that the health and safety at work of every person employed by the employer is protected. Also, it was performed to meet the requirements of Section 30 of the *Ontario Occupational Health and Safety Act*, Revised Statutes of Ontario, 1990, Chapter 0.1. Furthermore, Section 125(1)(z.14) of the *Canada Labour Code* stipulates that the employer, to the extent that the employer controls the activity, will take all reasonable care to ensure that all persons granted access to the work place, other than the employer's employees, are informed of every known or foreseeable health and safety hazard to which they are likely to be exposed in the work place. 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.

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

- .1 **Acrylonitrile:** "Designated Substance – Acrylonitrile" *O.Reg 835* (as amended by *O.Reg 490/09*)
- .2 **Arsenic:** "Designated Substance – Arsenic" *O.Reg 836* (as amended by *O.Reg 490/09*)
- .3 **Asbestos**
 - .1 "The Regulation Respecting Asbestos" *O.Reg 837* (as amended by *O.Reg 490/09*)
 - .2 "General – Waste Management" *O.Reg 347* (as amended)
 - .3 "Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations" *O.Reg 278/05* (as amended by *O.Reg 493/09*)
 - .4 *PWGSC Departmental Policy DP 057 – "Asbestos Management"*
- .4 **Benzene:** "Designated Substance – Benzene" *O.Reg 839* (as amended by *O.Reg 490/09*)

- .5 **Coke Oven Emissions:** "Designated Substance – Coke Oven Emissions" O.Reg 840 (as amended by O.Reg 490/09)
- .6 **Ethylene Oxide:** "Designated Substance – Ethylene Oxide" O.Reg 841 (as amended by O.Reg 490/09)
- .7 **Isocyanates:** "Designated Substance – Isocyanates" O.Reg 842 (as amended by O.Reg 490/09)
- .8 **Lead:**
 - .1 "Designated Substance – Lead" O.Reg 843 (as amended by O.Reg 490/09)
 - .2 "General – Waste Management" O.Reg 347 (as amended)
 - .3 Hazardous Products Act's Regulations Amending the Surface Coating Materials Regulations SOR/2005-109
- .9 **Mercury:**
 - .1 "Designated Substance – Mercury" O.Reg 844 (as amended by O.Reg 490/09)
 - .2 "General – Waste Management" O.Reg 347 (as amended)
- .10 **Silica:** "Designated Substance – Silica" O.Reg 845 (as amended by O.Reg 490/09)
- .11 **Vinyl Chloride:** "Designated Substance – Vinyl Chloride" O.Reg 846 (as amended by O.Reg 490/09)
- .3 All contractors requesting tenders from subcontractors shall furnish this report to subcontractors. **This report must be read in its entirety, including text and tables.**

1.2 VALIDITY DATE

- .1 Applicable sampling and analytical results contained in the following Designated Substances Reports have been referenced in this Section:
 - 1 'Designated Substances Report for the Exterior Masonry and Window Maintenance, Mortar Joints and Window Painting Project, Confederation Building, 229 Wellington Street, Ottawa, Ontario – October 2013'.
 - 2 'Designated Substances Report for the Window Replacement and Renovation on multiple floors – November 2010'

- .2 The work area is located at the Confederation Building, 249 Wellington Street, Ottawa, Ontario. The scope of the work proposed consists of removing select exterior windows for restoration both on site and at an off-site location.
 - .1 Previous sampling was limited to readily accessible areas. Destructive testing was not included, but is recommended prior to any major demolition. Due to the nature of building construction, some inherent limitations exist as to the possible thoroughness of the designated substance survey. The survey did not include the demolition of floors, floor finishes, plaster ceilings or walls or other areas to examine concealed conditions. No confined space was accessed for the purpose of this report.
 - .2 It is possible that the designated substances aforementioned are present in non-accessible areas and concealed spaces (i.e., wall and ceiling cavities), or confined spaces. No other areas outside the defined work boundaries have been assessed.
 - .3 Prior to beginning work, it must be confirmed with the Departmental Representative that no additional designated substances have been brought to the project area.
 - .4 There is a possibility that materials which 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, work must be stopped, precautionary 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:** Not Identified
- .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 area have been analyzed for asbestos. Analytical results of the bulk samples previously collected within the project area indicate that window caulking and putty contain non friable Chrysotile asbestos. As such, all windows should be considered as having asbestos containing caulking. The results of the previous sampling are shown in Table 1.

Table 1: Asbestos Sample Results by Polarized Light Microscopy

| Sample ID | Material | Location | Asbestos Type | Asbestos content (%) |
|-----------|--------------------|---|---------------|----------------------|
| M-01* | Brick Mortar | "Q"Elevation - At Window Jamb, 7 th Level Window | n/d | n/a |
| M-02* | Brick Mortar | "Q"Elevation - At Facade, 4 th Level Window | n/d | n/a |
| M-03* | Brick Mortar | "Q"Elevation - At Facade, 4 th Level Window | n/d | n/a |
| M-04* | Brick Mortar | "Q"Elevation - Bed Joint on Lentil Sill, 3 rd Level Window | n/d | n/a |
| M-05* | Brick Mortar | "Q"Elevation - Top of Lentil Sill, 3 rd Level Window | n/d | n/a |
| M-06* | Brick Mortar | "Q"Elevation - Top of Lentil Sill, 3 rd Level Window | n/d | n/a |
| M-07* | Brick Mortar | "Q"Elevation - At Facade, 3 rd Level Window | n/d | n/a |
| M-08* | Brick Mortar | "Q"Elevation - At Facade, 3 rd Level Window | n/d | n/a |
| M-09* | Brick Mortar | "O" Elevation – Window Bank at Grade | n/d | n/a |
| M-10* | Brick Mortar | "O" Elevation – Window Bank at Grade | n/d | n/a |
| WBC-01A* | Water Bar Compound | "Q"Elevation – Concealed beneath stone window sill and façade stonework, 7 th Level Window | n/d | n/a |
| WBC-01B* | Water Bar Compound | "M"Elevation - Window Bank at Grade | n/d | n/a |
| WBC- | Water Bar Compound | "M"Elevation - Window Bank | n/d | n/a |

| Sample ID | Material | Location | Asbestos Type | Asbestos content (%) |
|----------------|----------------------|---|----------------------------|----------------------|
| 01C* | | at Grade | | |
| C-01* | Caulking | "Q"Elevation - At Flashing, 7 th Level Window | Chrysotile | 1 |
| C-02* | Black Caulking | "Q"Elevation - At Window/Building Interface, 7 th Level Window | Chrysotile | 3.54 |
| C-03* | Caulking | "Q"Elevation - At Flashing, 7 th Level Window | Chrysotile | 3 |
| C-04* | Black Caulking | "Q"Elevation - At Window/Building Interface, 5 th Level Window | Chrysotile | 3.44 |
| C-05* | Black Caulking | "Q"Elevation - At Window/Building Interface, 3 rd Level Window | Chrysotile | 3.48 |
| C-06* | Caulking | "Q"Elevation - At Flashing, 7 th Level Window | Chrysotile | 3 |
| C-07* | Caulking | "M"Elevation - Window Bank at Grade | Chrysotile | 1.77 |
| C-08* | Caulking | "O"Elevation - Window Bank at Grade | Chrysotile | 1.27 |
| C-09* | Caulking | "O"Elevation - Window Bank at Grade | Chrysotile | 3.29 |
| WP-01A* | Window Putty | "Q"Elevation - At Window pane, 7 th Level Window | n/d | n/a |
| WP-01B* | Window Putty | "Q"Elevation - At Window pane, 4 th Level Window | Chrysotile | 0.88 |
| WP-01C* | Window Putty | "Q"Elevation - At Window pane, 3 rd Level Window | Not Analyzed/positive stop | |
| WP-02A* | Window Putty | "M"Elevation - Window Bank at Grade | Chrysotile | 0.93 |
| WP-02B* | Window Putty | "O"Elevation - Window Bank at Grade | Not Analyzed/positive stop | |
| WP-02C* | Window Putty | "O"Elevation - Window Bank at Grade | Not Analyzed/positive stop | |
| 02-04-11-10A** | Exterior Putty/Caulk | Room 207 EA-F2-W17 | n/d | n/a |
| 02-04-11-10B** | Exterior Putty/Caulk | Room 207 EA-F2-W17 | n/d | n/a |
| 02-04-11-10C** | Exterior Putty/Caulk | Room 207 EA-F2-W17 | n/d | n/a |
| 07-04-11-10A** | Exterior Putty | EB-F4-W5 | Chrysotile | 0.5% |

| Sample ID | Material | Location | Asbestos Type | Asbestos content (%) |
|----------------|-------------------------------|-----------------------|---------------|----------------------|
| 28-04-11-10A** | Exterior White Putty Hardened | EC-F10-W2 | Chrysotile | 1-5% |
| 28-04-11-10B** | Exterior White Putty Hardened | EC-F10-W2 | Chrysotile | 1-5% |
| 28-04-11-10C** | Exterior White Putty Hardened | EC-F10-W2 | Chrysotile | 1-5% |
| 31-04-11-10A** | Exterior Blue Grey Putty | F-12-W6 | n/a | n/d |
| 31-04-11-10B** | Exterior Blue Grey Putty | F-12-W6 | n/a | n/d |
| 31-04-11-10C** | Exterior Blue Grey Putty | F-12-W6 | n/a | n/d |
| n/a | Tar paper | Under the copper roof | Suspected | |

Bold items exceed the 0.5% regulated concentration of asbestos, as per O.Reg. 278/05, as amended.

* DST Consulting Engineers – October 2013: 'Designated Substances Report for the Exterior Masonry and Window Maintenance, Mortar Joints and Window Painting Project, Confederation Building, 229 Wellington Street, Ottawa, Ontario'

** PWGSC Environmental Services Directorate, November, 2010 'Designated Substances Report for the Window Replacement and Renovation on multiple floors, Confederation Building, Ottawa, Ontario'

n/d = none detected, n/a = not applicable.

- .1 All caulking applications should be treated as asbestos-containing when disturbing this material.
- .2 All window putty applications should be treated as asbestos-containing when disturbing this material.

.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 1980's 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 *Regulations Amending the Surface Coating Materials Regulations* SOR/2010-224, as

amended, allowable concentration of lead in surface coatings is 0.009 percent by weight (weight of lead to weight of paint), which is equivalent to 90 parts per million (ppm).

- .2 Even at very low concentrations, there may be potential for exposure to very high levels of lead depending on the activities performed that disturb the lead-containing materials. At low lead concentrations, conducting a risk assessment to assess the potential for exposure is required to determine the need to follow precautionary measures.
- .3 Representative paint and mortar samples from the project area have been analyzed for lead content. Analytical results indicate that paints in the project area have a lead content above the 90ppm threshold outlined in the Canada Consumer Product Safety Act's *Surface Coating Materials Regulations SOR/2005-109*. The results are shown in Table 2 below. In addition to window paint samples, mortar samples were collected in October, 2013. The results can be found in Table 2 .

Table 2: Lead in Paint Sample Results

| Sample ID | Description | Location | Lead Content (ppm) |
|----------------------------|---------------------------|---|--------------------|
| PC-01* | "Olive" Green Paint | "Q" Elevation – Wood Window Sill, 5 th Level Window | 220,000 |
| PC-02* | "Olive" Green Paint | "Q" Elevation - Wood Transom Sill, 3 rd Level Window | 139,000 |
| PC-03* | Dark Green Paint | "O" Elevation – Wood Bottom Rail, Window Bank at Grade | 162,000 |
| 01-04-11-10** | Interior White Paint | Room 207 EA-F2-W17 | 1,690 |
| 03-04-11-10** | Exterior Green Paint | Room 207 EA-F2-W17 | 42,900 |
| 04-04-11-10** | Exterior Green Paint | Room 332 ER-F3-W2 | 69,700 |
| 05-04-11-10** | Interior White Paint | Room 332 ER-F3-W2 | 2,670 |
| 08-04-11-10** | Interior Grey Paint | EB-F4-W5 | 34,900 |
| 09-04-11-10** | Exterior Green Paint | EB-F4-W5 | 64,100 |
| 10-04-11-10** | Interior Beige Paint | Room 576 ED-F5-W5 | 423 |
| 11-04-11-10** | Exterior Green Paint | Room 576 ED-F5-W5 | 34,700 |
| 14-04-11-10** | Exterior Green/Grey Paint | Room 651 EO-F6-W2 | 19,600 |
| 15-04-11-10** | Interior Blue Paint | Room 651 EO-F6-W2 | 378 |
| 16-04-11-10** | Exterior Blue Paint | Room 619 EA-F6-W8 | 36,200 |
| 17-04-11-10** | Interior Brown Paint | Room 619 EA-F6-W8 | 4,510 |
| 19-04-11-10** | Interior White Paint | Room 707 EA-F7-W16 | 1,470 |
| 20-04-11-10** | Exterior Green Paint | Room 707 EA-F7-W16 | 36,100 |
| 22-04-11-10** | Interior Grey Paint | ER-F7-W3 | 8220 |
| 23-04-11-10** | Exterior Green Paint | ER-F7-W3 | 44,100 |
| 24-04-11-10** | Exterior Green Paint | Room 879 EE-F8-W2 | 27,600 |
| 25-04-11-10** | Interior White Paint | Room 879 EE-F8-W2 | 1,360 |
| 26-04-11-10** | Exterior Green Paint | Room 925 EA-F9-W3 | 35,200 |
| 27-04-11-10** | Interior White Paint | Room 925 EA-F9-W3 | 17,300 |
| 29-04-11-10** | Exterior Green Paint | EC-F10-W2 | 63,500 |
| 30-04-11-10** | Interior White Paint | EC-F10-W2 | 5,460 |
| 32-04-11-10** | Exterior Grey Paint | F-12-W6 | 66,900 |
| 33-04-11-10** | Interior Grey Paint | F-12-W6 | 368 |
| 2014-01-15 CONF-WB-PB-1 | Water Bar | EM-B-W6 | 1600 |
| 2014-01-15 CONF-WB-PB-2 | Water Bar Compound | EM-B-W6 | 81300 |

Bold items exceed the 90 ppm limit for lead, as per *Canada Consumer Product Safety Act's Surface Coating Materials Regulations* SOR/2005-109

* DST Consulting Engineers – October 2013: 'Designated Substances Report for the Exterior Masonry and Window Maintenance, Mortar Joints and Window Painting Project, Confederation Building, 229 Wellington Street, Ottawa,'

** PWGSC Environmental Services Directorate, November, 2010 'Designated Substances Report for the Window Replacement and Renovation on multiple floors'

Table 3: Lead in Mortar Sample Results

| Sample ID | Description | Location | Lead Content (ppm) |
|-----------|-------------|--|--------------------|
| ML-02* | Mortar | "Q"Elevation - At Facade, 4 th Level Window | 10 |
| ML-03* | Mortar | "Q"Elevation - At Facade, 4 th Level Window | 52 |
| ML-07* | Mortar | "Q"Elevation - At Facade, 3 rd Level Window | 25 |
| ML-10* | Mortar | "O" Elevation – Window Bank at Grade | 39 |

* DST Consulting Engineers – October 2013: 'Designated Substances Report for the Exterior Masonry and Window Maintenance, Mortar Joints and Window Painting Project, Confederation Building, 229 Wellington Street, Ottawa,'

- .9 **MERCURY:** Not Identified
- .10 **SILICA: Identified**
 Free crystalline silica is present in concrete, masonry and mortar within the project area.
- .11 **VINYL CHLORIDE MONOMER:** Not Identified
- .12 **POLYCHLORINATED BIPHENYLS (PCBs):** Not Identified
- .13 **HALOCARBONS:** Not Identified

2.2 RECOMMENDATIONS

1. 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 by *O.Reg 493/09*), 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.

.1 The following criteria shall be utilized in determining the classification of asbestos work as indicated in *PWGSC DP 057*, Annex C, Appendix 5 and "Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations" *O.Reg 278/05* (as amended by *O.Reg 493/09*). These criteria are not exhaustive. When classification of the work is uncertain, refer to the Ontario Regulation:

Type 1 work generally includes installation or removal of a wetted non-friable ACM with a hand tool; disturbance of wetted non-friable ACM with a powered tool equipped with a High Efficiency Particulate Aerosol (HEPA) dust collection device; removal of less than one square metre of wetted drywall materials where joint filling materials contain asbestos; removal or replacement of less than 7.5 square metres asbestos-containing compressed mineral fibre-type ceiling tiles; collecting wetted samples of suspected friable asbestos material, and working close to friable sprayed asbestos, where the material may be affected by the work activities.

Type 2 work generally includes the removal or replacement of more than 7.5 square metres asbestos-containing compressed mineral fibre-type ceiling tiles; entry into ceiling space, crawl spaces, pipe tunnels etc., where friable asbestos debris is present; minor removal of friable ACM; Type 2 removal is limited to a maximum per work period of one square metre of surface area; the repair of asbestos mechanical insulation (no limit is imposed as to the amount of repair permitted under Type 2 conditions); and any disturbance not classified as either Type 1 or 3.

Type 3 work generally includes more than minor removal or disturbance of friable ACM; the use of a power tool on non-friable ACM without a HEPA exhausted dust collection; the spray application of an encapsulate or sealer to friable asbestos surfacing materials; the disturbance of the ductwork and air handling equipment serving or passing through areas of buildings with sprayed asbestos fireproofing or insulation, and the repair, alteration or demolition of a boiler, furnace, kiln or similar equipment with asbestos-containing refractory.

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 by *O.Reg 493/09*), the more stringent shall apply.

The "General – Waste Management" *O.Reg 347/90, as amended*, governs the disposal of waste containing asbestos. The waste must be disposed at a licensed waste disposal site.

2. LEAD

If lead-containing materials are disturbed (i.e. during dry sanding, grinding, polishing and sawing operations), then proper precautions, as outlined under "Designated Substances - Lead" *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 (TWAEV) to airborne lead dust or fumes should not exceed the Ministry of Labour's 0.05 milligram per cubic metre (mg/m³) 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. It should be noted that the use of mechanically-powered tools or torches on lead-containing materials increases the concentration of airborne lead dust or fumes and thereby requiring more stringent respiratory protection and controlled work procedures.

.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.

.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).

3. SILICA

.1 Silica occurs as crystalline material in cement. Crystalline silica is regulated under "Designated Substance – Silica" *O.Reg 845* (as amended by *O.Reg 490/09*) 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 containing concrete, mortar and masonry is 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.

4. CONTRACTORS DUTIES

The contractor must review the designated substance 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