DESIGNATED SUBSTANCE SURVEY

LaSalle Causeway
Kingston, Ontario

Prepared for:
Public Works and Government Services Canada
4900 Yonge Street
Toronto, Ontario
M2N 6A6

FINAL REPORT

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Executive Summary

DST Consulting Engineers Inc. was retained by Public Works and Government Services Canada (PWGSC) to conduct a Designated Substances Survey (DSS) including the identification of hazardous materials at the LaSalle Causeway in Kingston, Ontario. This survey meets the building owner's legal obligations to maintain a record of asbestos containing materials, as required by Ontario Regulation (O.Reg.) 278/05 – *Designated Substance: Asbestos on Construction Projects and in Buildings and Repair Operations*, and the requirement to maintain a record of materials containing the 11 designated substances listed in the Occupational Health and Safety Act, as required by Section 30 of the, R.S.O. 1990, Chapter 0.1.

DST performed the site visit of the LaSalle Causeway, Kingston, Ontario, on January 19, 2009. The LaSalle Causeway is a historic lift bridge located at the southern entrance of the Rideau Canal in the City of Kingston. It opened in 1917 and was designed as a wharf-road-bascule bridge to provide east-west transportation connections in the Kingston area. The site consists of the lift bridge and two buildings; the main building and the control building (see Photos 1 and 2 in Appendix C). It is noted that according to the site representative, the structures are greater than 20 years in age.

Materials suspected of containing designated substances (Asbestos, Lead, Mercury, Silica, Benzene, Acrylonitrile, Arsenic, Coke Oven Emissions, Ethylene Oxide, Isocyanates or Vinyl Chloride) or other hazardous materials, were visually identified based on the surveyor's knowledge of these building products. Visual identification of materials suspected to contain asbestos or lead was supported by the collection and analysis of a limited number of representative samples. Materials suspected of containing designated substances other than asbestos or lead (in paint) were identified by appearance, age, and knowledge of historic applications. In addition to the Designated Substances listed by the Province of Ontario, hazardous materials surveyed included polychlorinated biphenyls (PCBs), ozone-depleting substances (ODSs), urea formaldehyde foam insulation (UFFI), fuel, oil, and/or waste oil storage, chemical storage, radioactive materials, and mould.

A summary of the findings and recommendations for the LaSalle Causeway DSS are as follows:

Asbestos

A representative number of samples suspected to contain asbestos were collected and analyzed for asbestos content. All samples analyzed were non-asbestos containing.

Lead

Nine of fourteen sampled paint applications sampled exceeded either 600 ppm or 5000 ppm of lead.

Note: Although the Ministry of Labour (MOL) has published a guideline for control of lead exposures on construction projects, it does not include a criterion for the classification of lead-paint. Instead, it uses presumed airborne lead concentrations as criteria for classifying work. However, in regulations set by the U.S. Department of Housing and Urban Development, Lead-Based Paint is classified as any paint application containing at least 1.0 milligrams of lead per square centimetre of surface area (1.0 mg/cm^2), or at least 0.5% lead content by weight (5,000 ppm). This criterion was widely, although not universally, used in Canada. In Canada, the

Federal Hazardous Product Act has recently lowered the allowable concentration of lead in paints for new consumer products to 0.06% lead content by weight (600 ppm). For the purposes of this survey paints having a lead content greater than 0.06% are considered to be lead-based.

All of the interior paint samples were in fair/good condition at the time of the survey; however, the lift bridge structure paint, which contained a lead content in excess of the 600 - 5000 ppm range was found to be peeling and flaking over much of its surface (suspected due to sub-paint rusting). Consideration should be given to repairing/removing this peeling paint.

Lead is suspected to be present as a normal constituent of the solder on copper piping.

While performing lead paint removal work, the Ministry of Labour document "Guideline: Lead on Construction Projects" issued September 2004 should be referenced with regard to controlling lead exposure to employees/workers at the worksite, classification of removal works and appropriate measures and procedures for working with lead.

The disposal of construction waste containing lead is governed by *O.Reg. 347/90 - General – Waste Management,* as amended. The classification of the waste is dependent upon the results of leachate tests. The transport of the waste to the disposal site is controlled by the federal Transportation of Dangerous Goods Act, 1992.

Mercury

Mercury is present in the fluorescent light tubes that are found in the Main office building.

When removal of the fluorescent light tubes is required, the tubes should be removed intact from the fixtures. This prevents worker exposure to mercury vapour, particularly if the tubes were energized shortly before removal.

Mercury is classified as a hazardous waste under *O.Reg. 347/90 - General – Waste Management,* as amended. The transport of the waste to the disposal site is controlled by the federal Transportation of Dangerous Goods Act, 1992. It is now common practice to recycle fluorescent light tubes, recovering the component materials, and avoiding the generation of hazardous waste.

Silica

Silica is present in concrete products and the brick & mortar associated with the chimney.

Dust control procedures, which are typical of any well executed renovation or demolition project, are usually sufficient to control airborne silica levels. As a general rule, it is preferable to use more stringent dust suppression techniques and engineering controls as opposed to relying on respiratory protection to control worker exposure. Respiratory protection should only be relied on as a last resort when dust suppression techniques and engineering controls fail to control worker exposure to silica.

Benzene

Benzene may be a normal constituent associated with the gasoline, motorized oils and paint thinners.

Other Designated Substances

The following designated substances were neither observed nor suspected to be present at the LaSalle Causeway:

- Acrylonitrile;
- Arsenic;
- Coke Oven Emissions;
- Ethylene Oxide;
- Isocyanates; and,
- Vinyl Chloride.

Polychlorinated Biphenyls (PCBs)

All of the light ballasts were energized at the time of the survey and could not be safely examined to determine the presence/absence of PCBs. It is assumed that from the age of the building, the installation of the fixtures is pre-1980 and ballasts are considered to be potentially PCB-containing.

When the fluorescent light fixtures are eventually taken out of service, the ballasts should be examined to determine their PCB content. This can be done by comparing the ballast codes to information contained in *Identification of Lamp Ballasts Containing PCBs,* published by Environment Canada. If there is any ballast previous to 1980, it should be treated as PCB-containing. Once they are no longer in use this ballast should be appropriately handled and disposed of.

Ballasts that contain PCBs must be packaged, transported and disposed of in accordance with all appropriate provincial and federal regulations.

Ozone Depleting Substances (ODSs)

The refrigerator located at the Main office appeared to be newer in age, and is not suspected to have a type of refrigerant containing ODSs. However, this could not be confirmed at the time of the site survey and should be treated as ODS-containing until proven otherwise. Service tags should be updated to include the model, serial number, refrigerant type and quantity, cooling capacity, and date stamp information. If and when this unit is taken out of service, the ODS refrigerant must be captured and reclaimed by a licensed technician.

Urea Formaldehyde Foam Insulation (UFFI)

No UFFI was identified in buildings

Fuel, Oil, and/or Waste Oil Storage

One (1) newer fibreglass wrapped 200 gallon above ground storage tank (AST) is located on the main level of the Main office building in the furnace room. There were a total of three (3) fireproof cabinets that were located on the main level. One was located in the furnace room and two (2) locked cabinets were located in the room immediately north. These are utilized for chemical storage. The following were found in the cabinets at the time of inspection; paint, paint thinner, motor oils, gasoline canisters (full and partially full), gun wash solvent, gear lubricant and oily rags.

Chemical Storage

There were a number of unidentifiable chemical containers located in the fireproof cabinet in the furnace room that also houses various cans of paints and thinners. A MSDS binder was not readily available during the site visit and not all chemicals were labelled properly as per the Workplace Hazardous Materials Information System (WHMIS). (Photo 4, Appendix C)

These unlabeled or improperly labelled containers should be appropriately labelled as per WHMIS regulation.

Radioactive Materials

No radioactive materials were noted during the survey.

Mould

Approximately 2.5 square meters of potential mould was visually identified in the southwest room on the main floor as well as on the door of a wooden storage cabinet in the furnace room.
Remediation is recommended in accordance with Canadian Construction Association mould remediation guidelines. (Photo 3, Appendix C)

Table of Contents

Contents

List of Tables

List of Appendices

1.0 Introduction

DST Consulting Engineers Inc. was retained by Public Works and Government Services Canada (PWGSC) to conduct a Designated Substances Survey (DSS) including the identification of hazardous materials at the LaSalle Causeway in Kingston, Ontario. This survey meets the building owner's legal obligations to maintain a record of asbestos containing materials, as required by Ontario Regulation (O.Reg.) 278/05 – *Designated Substance: Asbestos on Construction Projects and in Buildings and Repair Operations*, and the requirement to maintain a record of materials containing the 11 designated substances listed in the Occupational Health and Safety Act, as required by Section 30 of the, R.S.O. 1990, Chapter 0.1.

1.1 Site Description

The LaSalle Causeway is a historic lift bridge located at the southern entrance of the Rideau Canal in the city of Kingston. It opened in 1917 and was designed as a wharf-road-bascule bridge to provide east-west transportation connections in the Kingston area. The site consists of the lift bridge and two structures; the main building and the control building (see Photos 1 and 2 in Appendix C).

1.2 Scope of Work

DST's scope of work was developed in response to PWGSC's request for proposal and is as follows:

- Conduct a thorough non-destructive intrusive room-by-room designated substances inspection.
- Collect and analyze the required number of building material samples to satisfy the requirements of O.Reg. 278/05;
- Collect and analyze paint chip samples of representative paint coatings of suspected lead-based paints in each building;
- Provide a summary of findings and recommendations for the site including:
  - digital photographs illustrating the location and current condition of representative asbestos-containing materials (ACMs) (principally those for which high priority recommendations are provided) and other designated substances;
  - floor plans illustrating locations of samples collected;
  - recommendations for the remediation of any deficient and, degraded condition ACMs, other designated substances, and hazardous materials, with particular emphasis placed on construction and renovation work.

1.3 Limitations of Report

This report is intended for client use only. Any use of this document by a third party, or any reliance on or decisions made based on the findings described in this report, are the sole responsibility of such third parties, and DST Consulting Engineers Inc. accepts no responsibility for damages, suffered by any third party as a result of decisions made or actions conducted based on this report. No other warranties are implied or expressed.

The data, conclusions and recommendations which are presented in this report, and the quality thereof, are based on a scope of work authorized by the client. The sampling program included sampling in select representative areas for laboratory analysis. There is a practical limitation on the number of intrusive test cuts that can be made and the number of air samples that can be collected in an occupied building. This requires the investigator to extrapolate observations and analytical results between test cut locations. The uncertainty, and inherent risk, associated with this necessity increases with the distance between sampling locations. Note, however, that no scope of work, no matter how exhaustive, can guarantee to identify all contaminants. This report therefore cannot warranty that all building conditions are represented by those identified at specific locations.

Recommendations, when included, are made in good faith and are based on several successful experiences. If either the condition of the building or the health of the occupants change in the future with respect to potential indoor air quality issues, the case should be reviewed and appropriate measures taken. DST is not in a position to evaluate the health risks associated with exposure to the mould referenced in this report. Since human reactions to mould exposure vary widely amongst individuals, and specific segments of the population are generally recognized to be more susceptible than others, an evaluation of health risks can only be made on an individual basis and even then, only by a licensed medical practitioner equipped with a knowledge of the individual's medical history.

Any use of this report by the client and any other party is contingent upon their understanding and acceptance of the following condition:

"Mould is a naturally occurring substance and regardless of the results of an assessment or how completely it is removed, it could reoccur."

Regardless of the effectiveness of any remedial actions, mould growth may occur/reoccur anywhere within a building at any time, should conditions be favourable. It is therefore essential to maintain buildings, surfaces, appliances and furnishings under conditions which are not favourable to mould incubation and growth (warm, dry, and clean). The scope of services provided by DST for this assignment did not include a detailed evaluation of the thermal and moisture management characteristics of the exterior wall assembly, or a detailed building envelope investigation to ascertain every potential root cause of the water infiltration that created an environment favourable to mould proliferation. Similarly, DST has not been engaged to provide detailed designs for the reinstatement of building finishes or for improvements to the building envelope.

Note also that standards, guidelines and practices related to mould investigations may change with time. Those which were applied at the time of this investigation may be obsolete or unacceptable at a later date.

Any comments given in this report on potential remediation problems and possible methods are intended only for the guidance of the designer. The scope of work may not be sufficient to determine all of the factors that may affect construction, clean-up methods and/or costs. Contractors bidding on this project or undertaking clean-ups should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the conditions may affect their work.

Any results from an analytical laboratory or other subcontractor reported herein have been carried out by others, and DST Consulting Engineers Inc. cannot warranty their accuracy. Similarly, DST cannot warranty the accuracy of information supplied by the client.

2.0 Survey Methodology

2.1 Site Inspection and Sampling

Site inspection and sampling was conducted on January 19, 2009. DST conducted the designated substances survey including the identification of hazardous materials and sampling in accordance with general health and safety requirements, a project-specific health and safety plan, and quality assurance/quality control (QA/QC) protocols to ensure the collection of high quality data.

The assessment of ACMs was performed for ongoing management, and may be used, subject to limitations, for future construction or renovation purposes. Where assumed ACMs have been identified in this report, or where ACMs may be present within concealed spaces, additional intrusive investigation, sampling and laboratory analysis of samples may be required.

The objective of the building surveys was to complete an inspection of the building exterior and of building interior components (e.g. mechanical systems, floors, ceilings and walls) within each room that was accessible using non-destructive techniques. Areas encountered within a building that were inaccessible at the time of the site visit were noted and are identified on the floor plans provided in Appendix A.

The inspection team performed the following tasks as part of the surveys:

- The completion of a site survey for each room within each building;
- An evaluation of the suspected ACM building materials (e.g. condition and friability);
- The collection of bulk material samples for the purpose of confirmatory laboratory analysis, where required. Samples in certain instances were not collected if sampling would have caused excessive damage, compromised building/system integrity (e.g. roofing, window caulking, etc.) or posed a potential safety concern to building occupants and/or the public;
- Materials not sampled which are suspected to contain asbestos (e.g. roofing, window caulking, etc.) should be considered asbestos-containing unless laboratory analysis proves otherwise (these materials were not sampled as it would compromise the integrity of the material);
- The visual identification of other suspected designated substances; and

- The preparation of floor plans showing the location of rooms surveyed and marking sample collection locations. No other materials were encountered that were suspected to contain asbestos.

Materials suspected of containing asbestos were analyzed using a combination of dispersion staining, polarized light microscopy (PLM) and Transmission Electron Microscopy (**TEM)** where applicable for floor tile samples at Moody, as per O. Reg. 278/05.

Floor plans that indicate asbestos and paint bulk sampling locations are provided in Appendix A. The certificates of analysis are provided in Appendix B and selected photographs are provided in Appendix C.

2.1.1 Evaluation of Accessibility

- The accessibility of building materials known or suspected of being ACM were assessed using the following criteria from PWGSC document (DM Directive 057 – Asbestos Management (1997). The accessibility was rated according to the Asbestos.

Floor plans that indicate asbestos and paint bulk sampling locations are provided in Appendix A. The certificates of analysis are provided in Appendix B and selected photographs are provided in Appendix C.

2.2 Asbestos-Containing Materials

The room by room visual inspection of all accessible areas of the buildings included areas above suspended ceilings, pipe chases, and access hatches when accessible. When materials suspected of containing asbestos were found, the accessibility, approximate quantity, and condition of the material was noted.

Bulk samples of suspected ACMs were collected by DST during the site investigation and submitted to Steve Moody Micro Services (Moody) for analysis. According to O.Reg. 278/05 it is not necessary to analyze multiple bulk material samples collected from the same area of homogeneous material if analysis establishes that a bulk material sample contains 0.5% or more asbestos by dry weight. The bulk samples were following criteria:

ACCESS (A)	Areas of the building within reach (from floor level) of all building users. Includes areas such as gymnasiums, workshops, and storage areas where activities of the building users may result in disturbance of ACM not normally within reach from floor level.
ACCESS (B)	Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder. Includes: frequently entered pipe chases, tunnels and service areas or areas within reach from a fixed ladder or catwalk, i.e., tops of equipment, mezzanines.
ACCESS (C) EXPOSED	Areas of the building above 8'0" where use of a ladder is required to reach the ACM. Only refers to ACM materials that are exposed to view, from the floor or ladder, without removing or opening other building components such as ceiling tiles, or service access doors or hatches. Does not include infrequently accessed service areas of the building.

ACCESS (C) CONCEALED	Areas of the building which require the removal of a building component, including lay-in ceilings and access panels into solid ceiling systems. Includes rarely entered crawl spaces, attic spaces, etc. Observations are limited to the extent visible from the access points.
ACCESS (D)	Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall or equipment, etc., is required to reach the ACM. Evaluation of condition and extent of ACM is limited or impossible, depending on the surveyor's ability to visually examine the materials in Access D.

2.2.1 Action Matrix & Action Descriptions

The Asbestos Management Program requires the following responses:

- Immediate clean-up of DEBRIS that is likely to be disturbed;
- The removal, repair or enclosure of friable ACM in POOR or FAIR condition where continued deterioration will result in DEBRIS that is likely to be disturbed.

The following factors shall be considered in making site-specific recommendations for compliance with the regulation, and for the practical implementation of asbestos management:

- ACM in POOR condition is not routinely repairable.
  If an abatement action is necessary, removal is the recommended action (enclosure is a viable option in unusual circumstances).

- Mechanical insulation in FAIR condition will be repaired or removed based on the following general recommendations, applied on a case by case basis.

  Repair ACM mechanical insulation found in FAIR condition in ACCESS (B) or ACCESS (C) EXPOSED areas.

  Remove ACM mechanical insulation found in FAIR condition in ACCESS (B) and ACCESS (C) EXPOSED areas, where future damage to the ACM is likely to occur.

- ACM in GOOD condition present in ACCESS (A) can be managed by surveillance, as long as it is not disturbed by future renovation, maintenance or demolition. Proactive removal of the ACM in ACCESS (A) will be considered where damage is possible by ongoing occupant activity (accidental or intentional).

- Non-friable or manufactured products are considered in the action matrix as follows:

  - Non-friable and manufactured products reported in POOR condition, or friable DEBRIS resulting from the deterioration of non-friable ACM, are treated as friable materials and the appropriate Action, depending on accessibility, is determined from the Action Matrix for friable ACM.
  - For non-friable or manufactured products reported in GOOD condition, Action 7 (surveillance) is recommended regardless of Accessibility.

- Remove all ACM from a particular area where small quantities of asbestos are present and removal will negate the need for the use of the Asbestos Management Program in that area.

The Action Matrix provided below establishes the recommended asbestos control action. The ACTIONS are described in full following the matrix.

ACTION MATRIX TABLE				
FRIABLE ACM				
ACCESS	**CONDITION**			**DEBRIS**
	GOOD	**FAIR**	**POOR**	
(A)	ACTION 5/7[1]	ACTION 5/6[2]	ACTION 3	ACTION 1
(B)	ACTION 7	ACTION 6/5[3]	ACTION 3	ACTION 1
(C) exposed	ACTION 7	7 ACTION 6	ACTION 4	ACTION 2
(C) concealed	ACTION 7	ACTION 7	ACTION 4	ACTION 2
(D)	ACTION 7	ACTION 7	ACTION 7	ACTION 7

[1]If material in **ACCESS (A)/GOOD** condition is not removed **ACTION 7** is required.
[2]If material in **ACCESS (A)/FAIR** condition is not removed **ACTION 6** is required.
[3]Remove **ACM** in **ACCESS (B)/FAIR** condition if **ACM** is likely to be disturbed.

ACTION 1	**Immediate Clean-up of Debris That is Likely to be Disturbed** Restrict access that is likely to cause a disturbance of the ACM DEBRIS and clean up ACM DEBRIS immediately. Utilize correct asbestos procedures. This action is required for compliance with regulatory requirements. The surveyor should immediately notify the Regional Asbestos Coordinator of this condition.
ACTION 2	**Entry Into Areas With ACM Debris - Type 2 Precautions** At locations where ACM DEBRIS can be isolated in lieu of removal or cleaned up, use appropriate means to limit entry to the area. Restrict access to the area to persons utilizing Type 2 asbestos-work precautions. The precautions will be required until the ACM DEBRIS has been cleaned up, and the source of the DEBRIS has been stabilized or removed.
ACTION 3	**ACM Removal Required for Compliance** Remove ACM for compliance with regulatory requirements. Utilize asbestos procedures appropriate to the scope of the removal work.
ACTION 4	**Access into Areas Where ACM is Present and Likely to be Disturbed by Access - Type 2 Precautions** Use Type 2 asbestos precautions when entry or access into an area is likely to disturb the ACM. ACTION 4 must be used until the ACM is removed (Use ACTION 1 or 2 if DEBRIS is present).
ACTION 5	**5 Proactive ACM Removal** Remove ACM in lieu of repair, or at locations where the presence of asbestos in GOOD condition is not desirable.
ACTION 6	**ACM Repair** Repair ACM found in FAIR condition, and not likely to be damaged again or

	disturbed by normal use of the area or room. Upon completion of the repair work, treat ACM as material in GOOD condition and implement ACTION 7. If ACM is likely to be damaged or disturbed, during normal use of the area or room, implement ACTION 5.

2.3 Lead

Lead can be found as a normal constituent of the following materials and products found at the site: paints, and solder on copper pipes.

Representative paint finishes were sampled and submitted to Caduceon Environmental Laboratories for lead content analysis.

Although the Ministry of Labour (MOL) has published a guideline for control of lead exposures on construction projects, it does not include a criterion for the classification of lead-paint. Instead, it uses presumed airborne lead concentrations as criteria for classifying work. However, in regulations set by the U.S. Department of Housing and Urban Development, Lead-Based Paint is classified as any paint application containing at least 1.0 milligrams of lead per square centimetre of surface area (1.0 mg/cm^2), or at least 0.5% lead content by weight (5,000 ppm). This criterion was widely, although not universally, used in Canada. In Canada, the Federal Hazardous Product Act has recently lowered the allowable concentration of lead in paints for new consumer products to 0.06% lead content by weight (600 ppm). For the purposes of this survey paints having a lead content greater than 0.06% are considered to be lead-based.

While performing lead paint removal work, the Ministry of Labour document “Guideline: Lead on Construction Projects” issued September 2004 should be referenced with regard to controlling lead exposure to employees/workers at the worksite, classification of removal works and appropriate measures and procedures.

2.3.1 Classification System

The conditions of painted surfaces were evaluated based on the following definitions:

- Poor: Significant cracking and/or peeling;
- Fair: Some minor cracking and/or peeling; and,
- Good: No peeling of painted surfaces.

2.3.2 Paint Sampling

Chisels and paint scrapers were used to collect bulk samples of paint. Paint was scraped directly off the surface into sample bags which were then sealed and labelled. Care was taken to avoid removing the substrate along with the paint.

2.4 Mercury

Mercury is a transitional metal that is liquid at room temperature. Numerous reports have cited mercury as being highly toxic, in particular to children and the foetus. Mercury can be found in the following equipment often found as part of mechanical systems in the building: thermometers, pressure gauges, and electrical switches. Fluorescent light tubes contain mercury vapour equivalent to a single droplet of liquid mercury. There are no regulations that specifically govern the disturbance of mercury on construction projects. However, the OHS Branch of the MOL has published *The Safe Handling of Mercury: A Guide for the Construction Industry*. This document provides advice on how to reduce the risk of mercury exposure and outlines clean-up methods for spills. During the survey materials containing mercury or

suspected of containing mercury were noted. No sampling of these materials for mercury was performed.

The OEL for airborne mercury is prescribed by Ontario Regulation 844, *Designated Substance – Mercury*, as amended. Work procedures and personal protective equipment must be used to ensure that workers are not exposed to airborne mercury levels that exceed this OEL.
Liquid mercury is classified as a hazardous waste under O.Reg. 347, as amended. The transport of the waste to a disposal site is controlled by O.Reg. 347 and by the federal TDGA. It is now common practice to recycle fluorescent light tubes, and other items containing mercury vapour or liquid mercury, recovering the component materials, and avoiding the generation of hazardous waste.

2.5 Silica

Silica is an abundant mineral that occurs naturally in sand and rock containing quartz. Silica is therefore a normal constituent present in many building materials, including concrete, terrazzo, hard plaster finishes, ceramic tiles and brick & mortar. No sampling of these materials for silica was performed.

There are no regulations that specifically govern the disturbance of silica on construction projects. However, the OHS Branch of the MOL has published the document *Guideline: Silica on Construction Projects*. This document classifies the disturbance of materials containing silica as either Type 1, Type 2 or Type 3 work, and assigns different levels of respiratory protection and work procedures for each classification. The OEL for airborne silica is prescribed by Ontario Regulation 845, *Designated Substance – Silica*, as amended. Work procedures and personal protective equipment must be used to ensure that workers are not exposed to airborne silica levels that exceed this OEL.

2.6 Benzene

Benzene may be a constituent of fuels and paint thinners both of which were found in containers and/or storage cabinets located on site on the main floor of the main office.

There are no regulations that specifically govern the disturbance of benzene on construction projects. Industrial processes involving benzene are regulated under the Ontario Regulation 839 *Designated Substance – Benzene*, as amended. The transport of the waste to the disposal site is controlled by the federal TDGA.

Storage tanks at the facility may have various regulatory requirements associated with tank use, maintenance, and decommissioning, such as under the *Ontario Environmental Protection Act* or *Technical Standards and Safety Act*. Also, Federal facilities are subject to requirements under CEPA for Regulations for Storage Tanks.

2.7 Other Designated Substances

The following Designated Substances are not expected to be present in any buildings at the institution in forms or quantities that would cause current concern:

- Acrylonitrile;
- Arsenic;
- Coke Oven Emissions;

- Ethylene Oxide;
- Isocyanates; and,
- Vinyl Chloride.

2.8 Polychlorinated Biphenyls (PCBs)

Polychlorinated Biphenyls, commonly known as Chlorobiphenyls or PCBs, are industrial chemicals which were synthesized and commercialized in North America starting in 1929. PCB oils were used in the manufacturing of fluorescent light ballasts, electrical equipment, heat exchangers, hydraulic systems, and several other specialized applications up to the late 1970s. They were never manufactured in Canada but were nevertheless widely used.

The handling, transport and disposal of PCBs are regulated under the Ontario Environmental Protection Act (EPA), R.*R.O. 1990, Regulation 362*, *Waste Management – PCBs, as amended*. According to the EPA, materials are deemed to contain PCBs if their concentration exceeds 50 ppm. or 50 mg/kg. PCB waste is defined as any liquid, solid or equipment that has been taken out of service for the purpose of disposal, and that contains PCB materials. The transport of PCB waste to the disposal site is controlled by the federal Transportation of Dangerous Goods Act, 1992.

The CEPA regulation regarding PCBs (PCB Regulations (SOR/2008-273)) should be referred to regarding the use, storage, labelling, reporting and eventual disposal of PCB containing materials at this federally regulated site.

Ten percent (10%) of the light ballasts were intended to be inspected where readily accessible. Unfortunately all of the ballasts were charged and in use at the time of the site inspection, and could not be safely accessed for inspection.

It is assumed that due to the age of the structure, the installation of the ballasts are pre-1980 and are therefore considered to be potentially PCB-containing.

2.9 Ozone-Depleting Substances (ODSs)

Ozone depleting substances (ODSs) include a variety of chlorofluorocarbon (CFC) and bromine (halon) gases which have been shown to contribute to the destruction of the earth's stratospheric ozone layer, and contribute to global warming. Direct exposure to some ODSs such as halon is a health hazard as well. ODSs are commonly used as refrigerants in a variety of equipment and in fire suppression systems. The use, servicing and decommissioning of refrigeration equipment containing ODSs is regulated under O.Reg. 189/94 Refrigerants, as amended. Federal facilities are also subject to the requirements of the Federal Halocarbon Regulation (2003).

Equipment potentially containing ODSs was visually inspected. For all ODS containing equipment, the following information was collected: model, serial number, refrigerant type and quantity, cooling capacity, and date stamp information, when accessible and where it was readily readable. Equipment was not disassembled to view concealed information.

The only equipment identified at the subject site as potentially containing ODS was the refrigerator.

2.10 Urea Formaldehyde Foam Insulation (UFFI)

Formaldehyde is a pungent, colourless gas commonly used in water solution as a preservative and disinfectant. It is also a basis for major plastics, including durable adhesives. It occurs naturally in the human body and in the outdoor environment. Formaldehyde is used to bond plywood, particleboard, carpets and fabrics, and it contributes to "that new car smell." Formaldehyde is also a by-product of combustion; it is found in tobacco smoke, vehicle exhaust and the fumes from furnaces, fireplaces and wood stoves.

Urea Formaldehyde foam insulation (UFFI) was developed in Europe in the 1950s as an improved means of insulating difficult-to-reach cavities in house walls. It is typically made at a construction site from a mixture of urea-formaldehyde resin, a foaming agent and compressed air. When the mixture is injected into the wall, urea and formaldehyde unite and "cure" into an insulating foam plastic. UFFI was banned in Canada in 1980.

2.11 Fuel, Oil, and/or Waste Oil Storage

The locations of stored fuel oil and waste oil were recorded along with a general description of the types of materials and rough estimate of quantities of materials stored. This was not a detailed inventory of each container.

2.12 Chemical Storage

The location of fuel and chemical storage rooms and cabinets were recorded along with a general description of the types of materials and rough estimate of quantities of materials stored. This was not a detailed inventory of each container. Only materials labelled as being hazardous or suspected to be hazardous were included in the survey. Non-labelled materials were not suspected as being hazardous due to discussions of current and historic work practices performed at the LaSalle Causeway.

2.13 Radioactive Materials

Radiation is a natural phenomenon that occurs from light and heat from the sun and natural elements in the soil and building materials. There are also other forms, which are man-made generated, such as radio waves from communication, microwaves from cooking, and x-rays from medical examinations.

Radioactive material also emits radiation which can occur naturally throughout our environment. However, there are also radioactive materials that are produced artificially. These ionising materials can emit gamma radiation and may emit alpha and or beta particles.

One convenient way of assessing the exposure risk from radioactive materials is to compare the exposure risk with the exposure from naturally occurring radioactive materials. We are all exposed continuously to everyday naturally occurring sources of radiation. When the risk of low-level exposure is evaluated by this assessment, the risk from radioactive materials can be shown to be harmless (following principals such as ALARA – as low as reasonably achievable).

Regulatory agencies have rules designed to reduce our exposure from artificial sources so that the total dose from natural and artificial sources is only slightly more than from natural sources alone. The very tiny risk, for example, from medical x-rays and other artificial sources is believed to be far less than the risks that we normally accept in everyday life.

2.14 Mould

The term “mould” applies to a large group of micro-organisms, which together, with mushrooms and yeast, form the Fungi Kingdom of living matter. Mould organisms grow by degrading nutrients from organic substrates such as wood and wood products, fabrics, foodstuff, plant and soil. The growth of mould necessitates three essential conditions; a suitable temperature, an appropriate substrate and adequate moisture.[1]

Public health and regulatory agencies acknowledge mould growth in general use buildings to be a risk factor for adverse health effects in occupants. Occupants may experience allergic responses such as asthma, headache, respiratory tract irritation, eye irritation, skin irritation, and sinus congestion. More severe health effects are rare and typically limited to individuals with suppressed immune systems, children, elderly people and persons with high occupational exposure.

Currently, there are no regulations pertaining to mould on construction projects. Most jurisdictions have issued alerts or bulletins concerning the hazard of mould in indoor environments. The Canadian Construction Association (CCA) published the following document as a response to concerns in the construction industry; CCA-82, “Mould Guidelines for the Canadian Construction Industry”, 2004.

3.0 Survey Findings

3.1 Asbestos

Seventeen (17) samples of suspected ACMs were collected and submitted for analysis. The results are presented in Table 1. The sample identification numbers, room number (where sampled and/or observed), description of material, friability, condition, accessibility, recommended action, and asbestos content are also included, where applicable, in this table. Approximate sampling locations are shown on the floor plans provided in Appendix A.

Table 1. Summary of Asbestos

Sample ID	Location	Material	Friable[1]	Condition[2]	Accessibility[3]	Action[4]	Asbestos[5] Content
003	Ground level chimney	Brick Mortar	N	G	C	NA	ND
009A	Ground level shower	Vinyl floor tile 12”x12” (grey/brown)	N	G	A	NA	ND
009B							
009C							
010A	Ground level bathroom	Vinyl floor tile 12”x12” (grey)	N	G	A	NA	ND
010B							ND

[1] Canadian Construction Association, CCA-82 “Mould Guidelines for the Canadian Construction Industry”, 2004

Sample ID	Location	Material	Friable[1]	Condition[2]	Accessibility[3]	Action[4]	Asbestos[5] Content
010C							ND
011A	Ground level bathroom	Ceiling tile (white) 2'x2'	N	G	A	NA	ND
011B							ND
011C							ND
012A	2nd floor landing	Vinyl floor tile 12"x12" (beige)	N	G	A	NA	ND
012B							ND
012C							ND
013A	2nd floor office	Ceiling tile (off-white painted) 12"x12"	N	G	A	NA	ND
013B							ND
013C							ND
014A	2nd floor main entrance	Flooring vinyl sheet (grey speckled)	N	G	A	NA	ND
014B							ND
014C							ND
015A	2nd floor boardroom	Ceiling tile (white painted) 12"x12"	N	G	A	NA	ND
015B							ND
015C							ND
016A	2nd floor admin office	Vinyl floor tile 12"x12" (brown/grey)	N	G	A	NA	ND
016B							ND
016C							ND
017	2nd floor office	Drywall joint compound	N	G	A	NA	ND
019	2nd floor admin office						ND
020	2nd floor main entrance						ND
021A	2nd floor boardroom	Ceiling tile (white painted) 12"x12"	N	G	A	NA	ND
021B							ND
021C							ND
023A	2nd floor office	Ceiling tile (white) 12"x12"	N	G	A	NA	ND
023B							ND
023C							ND
024A	Attic level	Ceiling tile (Scrap material, loose)	N	G	A	NA	ND
024B							ND
024C							ND
026A	Control building exterior	Parging grey cement compound	F	G	A	NA	ND
026B							ND
026C							ND
*027A	Main building exterior	Parging Grey/white cement compound	F	G	A	NA	ND
*027B							
*027C							

Notes:
1 Friability is assessed as friable or non-friable
2 Condition is rated as good, fair, or poor
3 Accessibility is A, B, C (exposed), C (concealed), or D as defined in PWGSC DP 057.
4 Action is 1, 2, 3, 4, 5, 6, or 7 as defined in PWGSC DP 057.
5 Asbestos Content is Chrysotile (C), Amosite (A) or other Fibre (O) expressed as a percentage
ND None Detected (for PLM <0.5%; TEM <0.1%)

* Sample number 027 accidentally duplicated for parging sample and paint sample shown on Table 2.

Based on the analytical results there was no regulated concentrations of asbestos in the samples collected.

3.2 Lead

Fourteen (14) samples of typical paint finishes were collected from painted interior surfaces located on site and were analysed for lead content. The analytical results are provided in Appendix 1 and are summarized in Table 2. The sample identification numbers, room number (where sampled and/or observed), description of material, condition, lead content and estimated quantity (for paints containing greater than the 600-5000 ppm range) are also included in this table. Approximate sampling locations of paint samples collected are shown on the floor plans provided in Appendix 1

Table 2. Summary of Lead Paint

Sample ID	Sample Area	Colour, Location Paint & Description	Condition[1]	Lead Content (ppm)
001	Ground level – stairwell	Grey wall paint	Good	**1450**
002	Ground level – chimney	Soot	Good	140
004	Ground level – chemical storage room	Grey wall paint	Good	**9740**
005	Ground level – back room	Blue wall paint	Good	**5920**
006	Ground level – furnace room	Grey floor paint	Good	**40800**
007	Ground level – furnace room	White window trim paint	Fair	157
008	Ground level – stairwell	Black beam paint	Good	**3620**
018	2nd floor – office	Light blue window sill paint	Good	8
022	2nd floor - office	Beige door frame paint	Good	**5440**
025	Lift bridge	Green exterior paint	Poor to fair	**15700**
027*	Control building	Ceiling/Window	Good	44
028	Main building	Off-white wall paint	Good	36
029	2nd floor – landing	White window trim paint	Good	**942**
030	Ground level – chemical storage room	Grey floor paint	Good	**5240**

Notes:
[1] Condition is rated as good, fair or poor.
* Sample number 027 accidentally duplicated for parging sample shown on Table 1 and paint sample.

Bold Exceeds the Surface Coating Materials Regulations limit of 0.06% by weight (mg/kg), or 600 ppm.

Based on the analytical results, nine of the paint samples collected were reported to contain a lead content in excess of 600 ppm and five exceeded 5000 ppm.

Lead is suspected to be present as a normal constituent of the solder on copper piping.

3.3 Mercury

Mercury may be found in fluorescent lamp tubes that are found on site. A total of sixty-eight (68) lamp tubes were counted in total.

3.4 Silica

Silica is expected to be present as a normal constituent in concrete building materials and on the solder on copper piping.

3.5 Other Designated Substances

Other designated substances were not identified on site at the time of the survey.

3.6 Polychlorinated Biphenyls (PCBs)

Based on the age of the main structure, fluorescent light ballasts are suspected to be PCB-containing. These ballasts were energized at the time of DST's site visit and could not be fully inspected to evaluate PCB content.

3.7 Ozone-Depleting Substances (ODSs)

The refrigerator located at the Main office appeared to be newer in age, and is not suspected to have a type of refrigerant containing ODSs. However, this could not be confirmed at the time of the site survey and should be treated as ODS-containing until proven otherwise.

3.8 Urea Formaldehyde Foam Insulation (UFFI)

No UFFI was identified on site.

3.9 Fuel, Oil, and/or Waste Oil Storage

One (1) 200 gallon fibreglass wrapped above ground storage tank (AST) is located on the main level of the Main office building in the furnace room. The immediate vicinity of the tanks showed no signs of spillage or leakage, historic or current. Furthermore, there was no sign of any floor drainage or secondary containment in the vicinity of the tank.

There were a total of three (3) fireproof cabinets that were located on the main level. One was located in the furnace room and two (2) locked cabinets were located in the room that housed chemical storage. The following may be found in either one of the cabinets; paint, paint thinner, motorized oils, gasoline canisters, gun wash solvent, gear lubricant and oily rags.

3.10 Chemical Storage

There were a number of unidentifiable chemical containers located in the fireproof cabinet in the room that housed the chemical storage. (See Photo 4, Appendix C)

3.11 Radioactive Materials

No radioactive materials were identified on site.

3.12 Mould

Approximately 2.5 square meters of potential mould was visually identified in the southwest room on the main floor as well as on the door of a wooden storage cabinet in the furnace room. The rooms did not exhibit signs of excessive humidity or visible moisture at the time of the site visit and no leaking or condensing piping was observed in these rooms at the time of the site visit. It was noted that the area of mould growth in the southwest corner room was directly beneath the coat hooks. Wet coats and gear are hung on these coats and may be a potential source of moisture.

Potential mould growths encountered appeared to be areas of darkened circular growths on the wall and doors of the cabinets, ranging from floor level to 1.6 metres in height. (See Photo 3, Appendix C)

4.0 Summary and Recommendations

The site investigation, sampling and analysis has confirmed that the following Designated Substances and Hazardous Materials are/may be present in forms and quantities expected to have a measurable impact on the future renovation plans:

- Lead;
- Mercury;
- Silica;
- Benzene;
- PCBs;
- ODSs; and,
- Mould

No other significant designated substance or hazardous materials were identified based on DST's site survey.

Our recommendations for each of the above-noted materials and for Fuel, Oil, and/or Waste Oil Storage / Chemical Storage which are based upon both regulatory compliance and best practice guidelines are presented below.

4.1 Lead

Nine (9) paint applications sampled exceeded 600 ppm and five exceeded 5000 ppm of lead.

All of the paint samples were in good condition at the time of the survey with the exception of the lift bridge paint which ranges from poor to fair depending on location. This paint was identified as having a lead content in excess of 600 ppm and 5000 ppm. It is recommended that the areas of poor condition paint be repaired/removed.

Lead is suspected to be present as a normal constituent of the solder on copper piping.

To remove solid lead materials associated with the pipes, the pipes can be cut a small distance (e.g. 50 mm) from the joints or caulking to avoid direct disturbance of the lead solder or caulking.

The work procedures outlined in the MOL document entitled *Guideline: Lead on Construction Projects* should be followed when work being performed will disturb lead-containing materials. The disposal of construction waste containing lead is governed by *O.Reg. 347/90 - General – Waste Management,* as amended. The classification of the waste is dependent upon the results of leach ate tests. The transport of the waste to the disposal site is controlled by the federal Transportation of Dangerous Goods Act, 1992.

4.2 Mercury

Mercury is present in the fluorescent light tubes that are found in the Main office buiding.

When removal of the fluorescent light tubes is required, the tubes should be removed intact from the fixtures. This prevents worker exposure to mercury vapour, particularly if the tubes were energized shortly before removal.

Mercury is classified as a hazardous waste under *O.Reg. 347/90 - General – Waste Management,* as amended. The transport of the waste to the disposal site is controlled by the federal Transportation of Dangerous Goods Act, 1992. It is now common practice to recycle fluorescent light tubes, recovering the component materials, and avoiding the generation of hazardous waste.

4.3 Silica

Silica is present in concrete products and the brick & mortar associated with the chimney.

Dust control procedures, which are typical of any well executed renovation or demolition project, are usually sufficient to control airborne silica levels. As a general rule, it is preferable to use more stringent dust suppression techniques and engineering controls as opposed to relying on respiratory protection to control worker exposure. Respiratory protection should only be relied on as a last resort when dust suppression techniques and engineering controls fail to control worker exposure to silica.

4.4 Benzene

Benzene may be a normal constituent associated with the gasoline, motorized oils and paint thinners.

There are no regulations that specifically govern the disturbance of benzene on construction projects. Industrial processes involving benzene are regulated under the Ontario Regulation 839 *Designated Substance – Benzene*, as amended. The transport of the waste to the disposal site is controlled by the federal TDGA.

Storage tanks at the facility may have various regulatory requirements associated with tank use, maintenance, and decommissioning, such as under the *Ontario Environmental Protection Act* or *Technical Standards and Safety Act*.

Furthermore, Federal facilities are subject to the requirements under the CEPA for Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations

4.5 Polychlorinated Biphenyls (PCBs)

All of the light ballasts were energized at the time of the survey and could not be safely examined to determine the presence/absence of PCBs. It is assumed that from the age of the building, the installation of the ballasts are pre-1980 and are therefore considered to be potentially PCB-containing.

When the fluorescent light fixtures are eventually taken out of service, the ballasts should be examined to determine their PCB content. This can be done by comparing the ballast codes to information contained in *Identification of Lamp Ballasts Containing PCBs,* published by Environment Canada. If there is any ballast previous to 1980, it should be treated as PCB-containing. Once they are no longer in use this ballast should be appropriately handled and disposed of.

Ballasts that contain PCBs must be packaged, transported and disposed of in accordance with all appropriate provincial and federal regulations.

4.6 Ozone Depleting Substances (ODSs)

The refrigerator located at the Main office appeared to be newer in age, and is not suspected to have a type of refrigerant containing ODSs. However, this could not be confirmed at the time of the site survey and should be treated as ODS-containing until proven otherwise. Service tags should be updated to include the model, serial number, refrigerant type and quantity, cooling capacity, and date stamp information. If and when this unit is taken out of service, the ODS refrigerant must be captured and reclaimed by a licensed technician. Requirements of the Federal Halocarbon Regulation (2003) must be met, including record keeping.

4.7 Fuel, Oil, and/or Waste Oil Storage

One (1) 200 gallon above ground storage tanks (ASTs) is located on the main level of the Main office building in the furnace room. There were a total of three (3) fireproof cabinets that were located on the main level. One was located in the furnace room and two (2) locked cabinets were located in the room that housed chemical storage. The following may be found in either one of the cabinets; paint, paint thinner, motorized oils, gasoline canisters, gun wash solvent, gear lubricant and oily rags.

4.8 Chemical Storage

There were a number of unidentifiable chemical containers located in the fireproof cabinet in the room that housed the chemical storage. A MSDS binder was not readily available during the site visit and not all chemicals were labelled properly as per the Workplace Hazardous Materials Information System (WHMIS).

These unlabeled or improperly labelled containers should be appropriately labelled as per WHMIS Regulations.

4.9 Mould

Approximately 2.5 square meters of potential mould was identified in the southwest room on the main floor as well as on the door of a wooden storage cabinet in the furnace room. Areas of mould impact should be removed using mould precautionary measures in accordance with the Canadian Construction Association guidelines[2]. The CCA guideline generally lists mould remediation precautionary measures based on the area of impacted building materials as follows: Level I (small scale) - <1 m^2; Level II (medium scale) – between 1 m^2 and 10 m^2; and Level III (large scale) – greater than or equal to 10 m^2. Other areas of the basements may be warranted to evaluate the potential presence of mould in other building materials in these areas that may have been impacted by moisture..

4.10 Other Designated Substances

Materials not sampled which are suspected to contain asbestos (e.g. roofing, window caulking, etc.) should be considered asbestos-containing unless laboratory analysis proves otherwise prior to any removal work or other work that is performed that may disturb the material and cause any existing asbestos fibres to become airborne. Note: These materials were not sampled as it would have compromised the integrity of the material.

5.0 Closure

We trust that the information contained herein meets your needs. Should you have any questions or comments, please do not hesitate to contact us.

DST CONSULTING ENGINEERS INC.

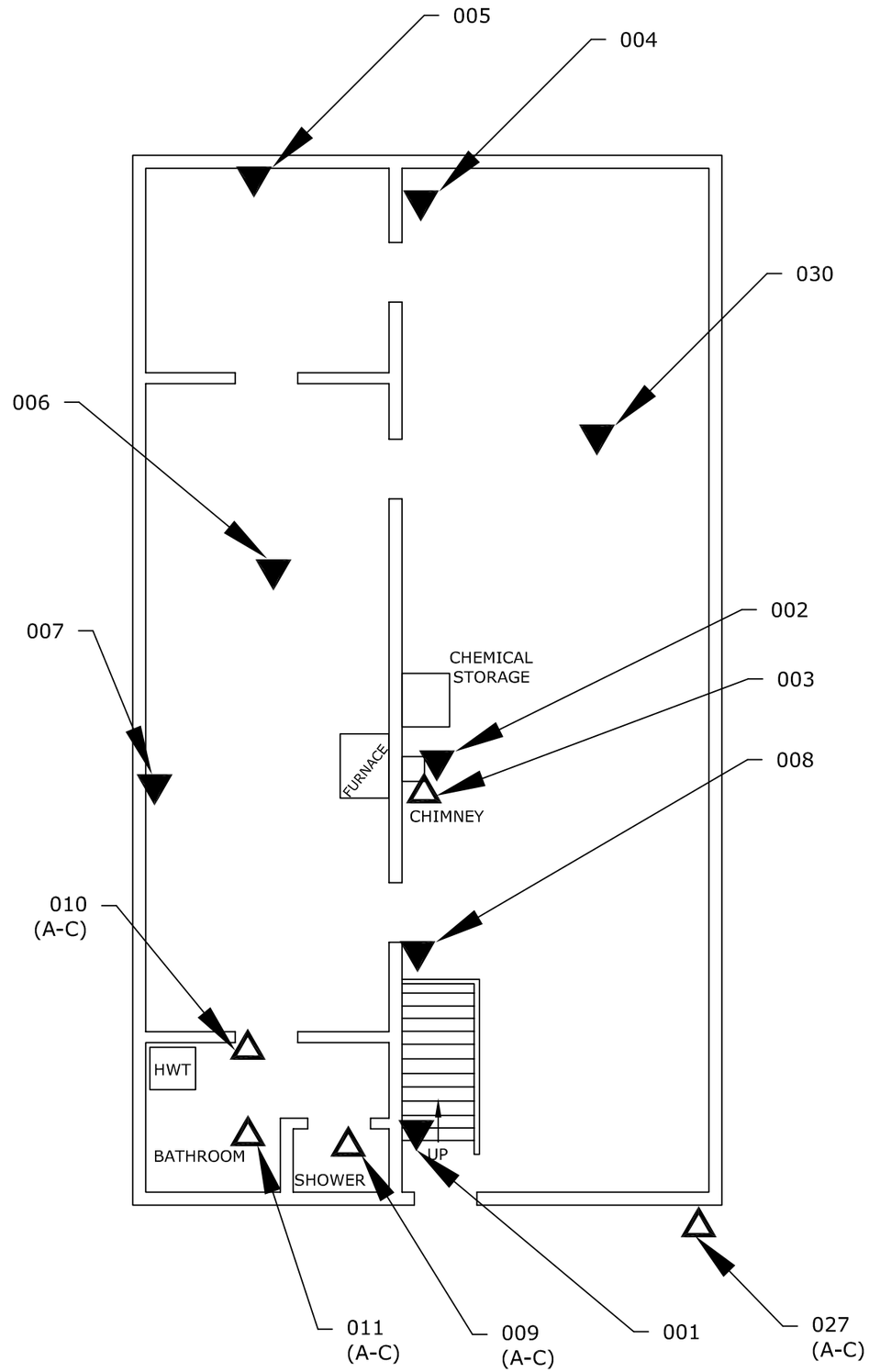
Sean Liddle
Project Manager

Brendan Harrigan, P.Eng.
Associate, Sector Manager

[2] *Mould Guidelines for the Canadian Construction Industry, Standard Construction Document CCA 82-2004,* Canadian Construction Association, 2004.

Appendix A

Floor Plans



Note: Sample numbering was accidentally duplicated for number 027. Lead paint sample 027 is shown on Figure 3 (the Control Building) whereas Sample 027 (A-C) for asbestos content is shown on Figure 1.

DST CONSULTING ENGINEERS
2150 THURSTON DRIVE, SUITE 203
OTTAWA, ONTARIO, K1G 5T9
TEL (613) 748-1415 FAX (613) 748-1356
www.dstgroup.com

NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE ASSOCIATED TECHNICAL REPORT.
2. DO NOT SCALE DRAWING.
3. ALL SMPLE IDENTIFIERS ARE PREFIXED WITH '9798-' WHICH WAS LEFT OUT FOR DRAWING CLARITY.

LEGEND:

▲ 001 A-C	APPROXIMATE ASBESTOS SAMPLE LOCATION
▼ 007	APPROXIMATE SAMPLE LOCATION LEAD PAINT TESTING

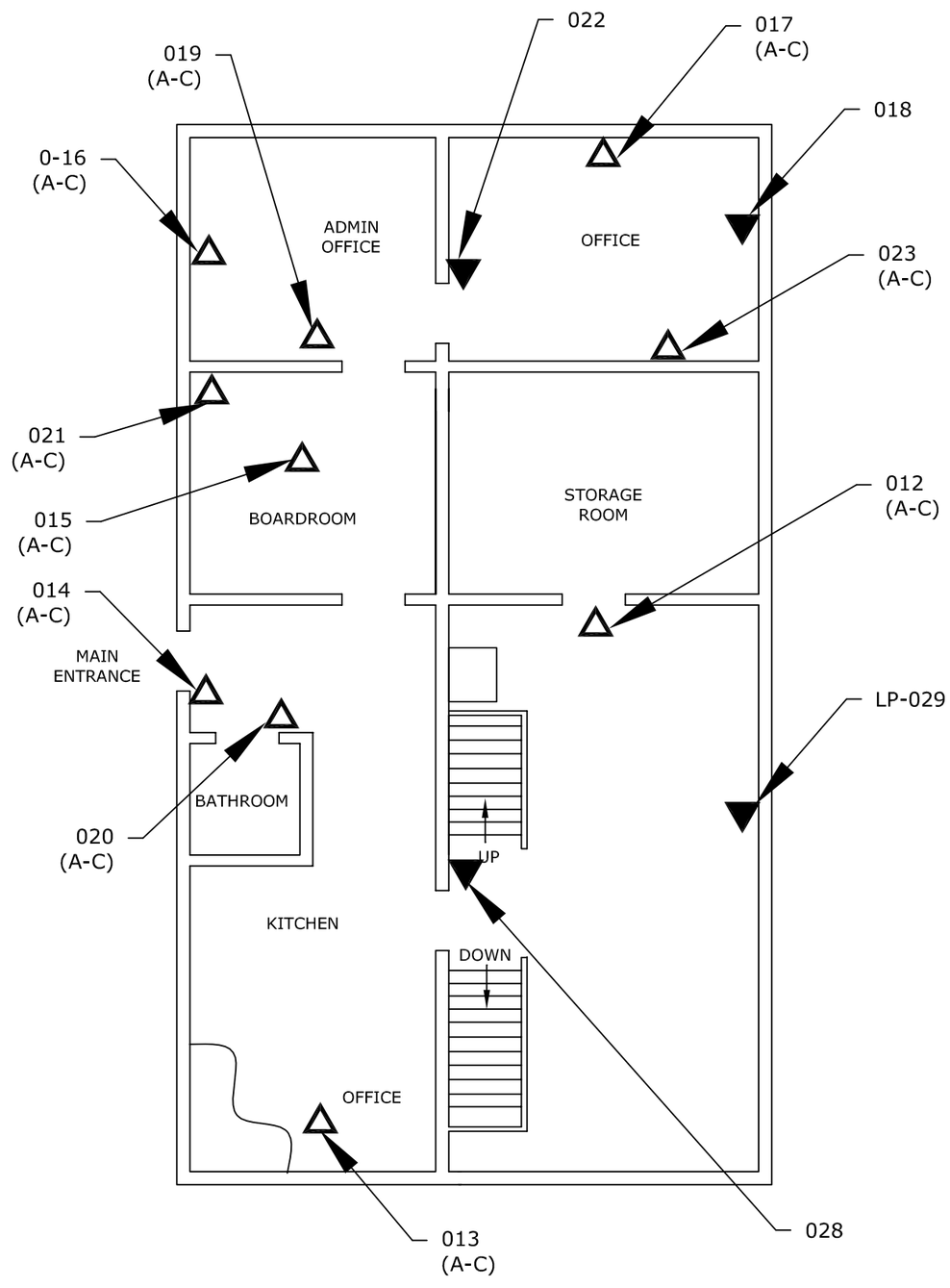
REV	DATE	ISSUE	APPROVAL
B	13/03/09	PRELIMINARY	B.H.

PROJECT TITLE
DESIGNATED SUBSTANCE SURVEY
LASALLE CAUSEWAY
KINGSTON, ONTARIO

DRAWING TITLE
SAMPLE LOCATION PLAN
GROUND LEVEL

DESIGNED BY S.L.	SCALE NTS
DRAWN BY V.C.	DATE March 2009
APPROVED BY B.H.	PROJECT NO.: BE-KG-009798

FIGURE 1



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LEGEND:

△ 001 A-C	APPROXIMATE ASBESTOS SAMPLE LOCATION
▼ 007	APPROXIMATE SAMPLE LOCATION LEAD PAINT TESTING

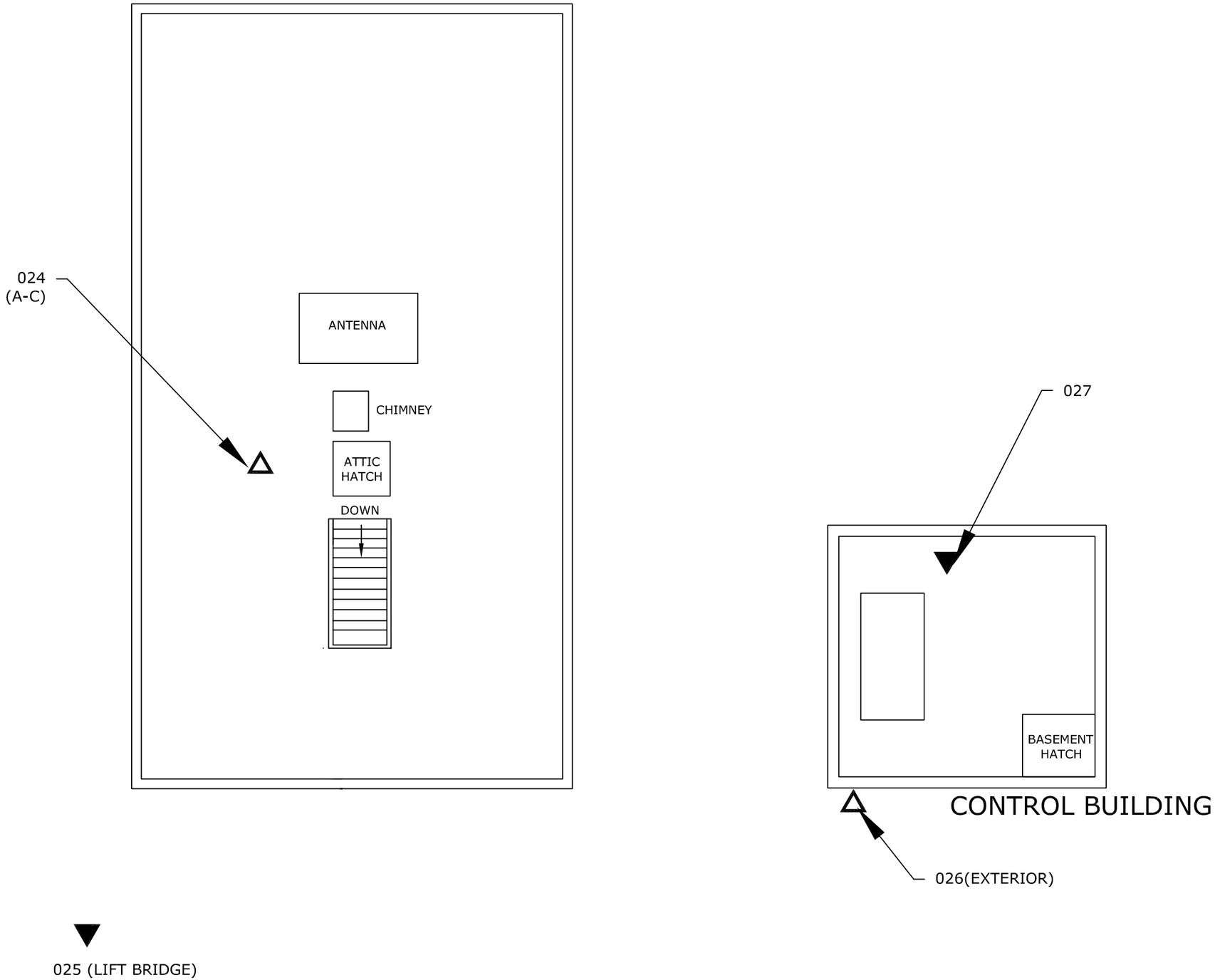
REV	DATE	ISSUE	APPROVAL
B	13/03/09	PRELIMINARY	B.H.

PROJECT TITLE
DESIGNATED SUBSTANCE SURVEY
LASALLE CAUSEWAY
KINGSTON, ONTARIO

DRAWING TITLE
SAMPLE LOCATION PLAN
SECOND FLOOR

DESIGNED BY S.L.	SCALE NTS
DRAWN BY V.C.	DATE March 2009
APPROVED BY B.H.	PROJECT NO.: BE-KG-009798

FIGURE 2



Note: Sample numbering was accidentally duplicated for number 027. Lead paint sample 027 is shown on Figure 3 (the Control Building) whereas Sample 027 (A-C) for asbestos content is shown on Figure 1.

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LEGEND:

▲ 001 A-C	APPROXIMATE ASBESTOS SAMPLE LOCATION
▼ 007	APPROXIMATE SAMPLE LOCATION LEAD PAINT TESTING

REV	DATE	ISSUE	APPROVAL
B	13/03/09	PRELIMINARY	B.H.

PROJECT TITLE
DESIGNATED SUBSTANCE SURVEY
LASALLE CAUSEWAY
KINGSTON, ONTARIO

DRAWING TITLE
SAMPLE LOCATION PLAN
ATTIC LEVEL

DESIGNED BY S.L.	SCALE NTS
DRAWN BY V.C.	DATE March 2009
APPROVED BY B.H.	PROJECT NO.: BE-KG-009798

FIGURE 3

Appendix B

Certificates of Analysis

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: C03000

REPORT No. B09-01886

Report To:

DST Consulting
556 O'Connor Dr. Suite 110
Kingston, Ontario, K7B 1N3
Attention: Sean Liddle

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston, Ontario, K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 21-Jan-09
DATE REPORTED: 27-Jan-09
SAMPLE MATRIX: Paint Chips

JOB/PROJECT NO.: L.C.W.
P.O. NUMBER:
WATERWORKS NO.

	Parameter:		Lead				
	Units:		µg/g				
	M.D.L.:		5				
	Reference Method:		EPA 6010				
	Date/Site Analyzed:		23-Jan-09/O				
Client I.D.	**Sample I.D.**	**Date Collected**					
027	B09-01886-1	19-Jan-09	44				
025	B09-01886-2	19-Jan-09	15700				
028	B09-01886-3	19-Jan-09	36				
007	B09-01886-4	19-Jan-09	157				
008	B09-01886-5	19-Jan-09	3620				
004	B09-01886-6	19-Jan-09	9740				
030	B09-01886-7	19-Jan-09	5240				
006	B09-01886-8	19-Jan-09	40800				
018	B09-01886-9	19-Jan-09	8				
005	B09-01886-10	19-Jan-09	5920				
029	B09-01886-11	19-Jan-09	942				
022	B09-01886-12	19-Jan-09	5440				
001	B09-01886-13	19-Jan-09	1450				
002	B09-01886-14	19-Jan-09	140				

Michelle Dubien
Lab Supervisor

M.D.L. = Method Detection Limit
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,P-Peterborough,M-Moncton

PLM Summary Report

Steve Moody Micro Services, LLC
2051 Valley View Lane
Farmers Branch, TX 75234 (Phone 972-241-8460)

NVLAP Lab No. 102056
TDSHS License No. 30-0084

Client : DST Consulting Engineers Inc - Kingston, ON
Lab Job No. : 09B-00785X
Project : Lasalle Causeway
Report Date : 02/19/2009
Project # : BEKG009798 Sample Date : 01/19/2009
Identification : Asbestos, Bulk Sample Analysis
Test Method : Polarized Light Microscopy / Dispersion Staining (PLM/DS)
EPA Method 600 / R-93 / 116

On 2/18/2009, forty three (43) bulk material samples were submitted by Sean Liddle of DST Consulting Engineers Inc - Kingston, ON for asbestos analysis by PLM/DS. The PLM Detail Report is attached; additional information may be found therein. The results are summarized below:

Sample Number	Client Sample Description / Location	Asbestos Content
003	Brick (Grey)	None Detected - Brick
009	Floor Tile (Grey / Brown)	None Detected - Floor Tile None Detected - Fiber Backing None Detected - Cream Mastic
009b	Floor Tile (Grey / Brown)	None Detected - Floor Tile None Detected - Fiber Backing None Detected - Cream Mastic
009c	Floor Tile (Grey / Brown)	None Detected - Floor Tile None Detected - Fiber Backing None Detected - Cream Mastic
011	Ceiling Tile (White)	None Detected - Acoustic Tile
011b	Ceiling Tile (White)	None Detected - Acoustic Tile
011c	Ceiling Tile (White)	None Detected - Acoustic Tile
010	Floor Tile (Grey)	None Detected - Floor Tile None Detected - Fiber Backing None Detected - Cream Mastic
010b	Floor Tile (Grey)	None Detected - Floor Tile None Detected - Fiber Backing None Detected - Cream Mastic
010c	Floor Tile (Grey)	None Detected - Floor Tile None Detected - Fiber Backing None Detected - Cream Mastic
012	Floor Tile (Beige)	None Detected - Floor Tile None Detected - Black Mastic
012b	Floor Tile (Beige)	None Detected - Floor Tile None Detected - Black Mastic
012c	Floor Tile (Beige)	None Detected - Floor Tile None Detected - Black Mastic
013	Ceiling Tile (Off-white Painted)	None Detected - Acoustic Tile

PLM Summary Report

Steve Moody Micro Services, LLC
2051 Valley View Lane
Farmers Branch, TX 75234 (Phone 972-241-8460)

NVLAP Lab No. 102056
TDSHS License No. 30-0084

Client : DST Consulting Engineers Inc - Kingston, ON
Lab Job No. : 09B-00785X
Project : Lasalle Causeway
Report Date : 02/19/2009
Project # : BEKG009798 Sample Date : 01/19/2009
Identification : Asbestos, Bulk Sample Analysis
Test Method : Polarized Light Microscopy / Dispersion Staining (PLM/DS)
EPA Method 600 / R-93 / 116

On 2/18/2009, forty three (43) bulk material samples were submitted by Sean Liddle of DST Consulting Engineers Inc - Kingston, ON for asbestos analysis by PLM/DS. The PLM Detail Report is attached; additional information may be found therein. The results are summarized below:

Sample Number	Client Sample Description / Location	Asbestos Content
013b	Ceiling Tile (Off-white Painted)	None Detected - Acoustic Tile
013c	Ceiling Tile (Off-white Painted)	None Detected - Acoustic Tile
014	Flooring (Grey Speckled)	None Detected - Floor Tile None Detected - Fiber Backing None Detected - Cream Mastic
014b	Flooring (Grey Speckled)	None Detected - Flooring None Detected - Fiber Backing None Detected - Cream Mastic
014c	Flooring (Grey Speckled)	None Detected - Flooring None Detected - Fiber Backing None Detected - Cream Mastic
015	Ceiling Tile (White Painted)	None Detected - Acoustic Tile
015b	Ceiling Tile (White Painted)	None Detected - Acoustic Tile
015c	Ceiling Tile (White Painted)	None Detected - Acoustic Tile
016	Floor Tile (Brown / Grey)	None Detected - Floor Tile None Detected - Black Mastic
016b	Floor Tile (Brown / Grey)	None Detected - Floor Tile None Detected - Black Mastic
016c	Floor Tile (Brown / Grey)	None Detected - Floor Tile None Detected - Black Mastic
017	Drywall Joint Compound (Light Grey Paint)	None Detected - Joint Compound
019	Drywall Joint Compound (Pale Yellow Paint)	None Detected - Joint Compound
021	Ceiling Tile (White Painted)	None Detected - Acoustic Tile
021b	Ceiling Tile (White Painted)	None Detected - Acoustic Tile
021c	Ceiling Tile (White Painted)	None Detected - Acoustic Tile

PLM Summary Report

Steve Moody Micro Services, LLC
2051 Valley View Lane
Farmers Branch, TX 75234 (Phone 972-241-8460)

NVLAP Lab No. 102056
TDSHS License No. 30-0084

Client : DST Consulting Engineers Inc - Kingston, ON
Lab Job No. : 09B-00785X
Project : Lasalle Causeway
Report Date : 02/19/2009
Project # : BEKG009798 Sample Date : 01/19/2009
Identification : Asbestos, Bulk Sample Analysis
Test Method : Polarized Light Microscopy / Dispersion Staining (PLM/DS)
EPA Method 600 / R-93 / 116

On 2/18/2009, forty three (43) bulk material samples were submitted by Sean Liddle of DST Consulting Engineers Inc - Kingston, ON for asbestos analysis by PLM/DS. The PLM Detail Report is attached; additional information may be found therein. The results are summarized below:

Sample Number	Client Sample Description / Location	Asbestos Content
027	Parging	None Detected - Grey Plaster None Detected - White Plaster
027b	Parging	None Detected - Grey Plaster None Detected - White Plaster
027c	Parging	None Detected - Grey Plaster None Detected - White Plaster
020	Drywall Joint Compound	None Detected - Joint Compound
024	Ceiling Tile	None Detected - Acoustic Tile
024b	Ceiling Tile	None Detected - Acoustic Tile
024c	Ceiling Tile	None Detected - Acoustic Tile
023	Ceiling Tile (White)	None Detected - Acoustic Tile
023b	Ceiling Tile (White)	None Detected - Acoustic Tile
023c	Ceiling Tile (White)	None Detected - Acoustic Tile
026	Parging	None Detected - Grey Plaster
026b	Parging	None Detected - Grey Plaster None Detected - White Plaster
026c	Parging	None Detected - Grey Plaster None Detected - White Plaster

These samples were analyzed by layers. Quantification, unless otherwise noted, is performed by calibrated visual estimate. Results may not be reproduced except in full. This test report relates only to the samples tested. These test results do not imply endorsement by NVLAP or any agency of the U.S. Government. Accredited by the National Voluntary Laboratory Accreditation Program for Bulk Asbestos Fiber Analysis under Lab Code 102056.

NVLAP

Analyst(s): Bruce Crabb, Debra O'Sullivan

Lab Manager : Bruce Crabb Approved Signatory : Bruce Crabb

Lab Director : Steve Moody Approved Signatory : Steve Moody

Thank you for choosing Steve Moody Micro Services

Steve Moody Micro Services, LLC
2051 Valley View Lane
Farmers Branch, TX 75234

PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab No. 102056
TDSHS License No. 30-0084

Client : DST Consulting Engineers Inc - Kingston, ON
Project : Lasalle Causeway
Project # : BEKG009798

Lab Job No. : 09B-00785X
Report Date : 02/19/2009

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
003	Brick (Grey)	100%	Aggregate	65%	01/27	DO
			Calcite / Binders	35%		
	sample results from 09B-00785					
009	Floor Tile (Grey)	50%	Calcite / Vinyl Binders	100%	01/27	DO
	Fiber Backing (Light Grey)	45%	Cellulose Fibers	50%		
			Glass Wool Fibers	10%		
			Wollastonite	5%		
			Binders / Fillers	35%		
	Cream Mastic (Cream)	5%	Glue Binders	100%		
	sample results from 09B-00785					
009b	Floor Tile (Grey)	78%	Calcite / Vinyl Binders	100%	02/19	BC
	Fiber Backing (Light Grey)	20%	Cellulose Fibers	50%		
			Glass Wool Fibers	10%		
			Wollastonite	5%		
			Binders / Fillers	35%		
	Cream Mastic (Cream)	2%	Glue Binders	100%		
009c	Floor Tile (Grey)	78%	Calcite / Vinyl Binders	100%	02/19	BC
	Fiber Backing (Light Grey)	20%	Cellulose Fibers	50%		
			Glass Wool Fibers	10%		
			Wollastonite	5%		
			Binders / Fillers	35%		
	Cream Mastic (Cream)	2%	Glue Binders	100%		
011	Acoustic Tile (Tan)	100%	Wood Fibers	100%	01/27	DO
	sample results from 09B-00785					
011b	Acoustic Tile (Tan)	100%	Wood Fibers	100%	02/19	BC
011c	Acoustic Tile (Tan)	100%	Wood Fibers	100%	02/19	BC

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Client : DST Consulting Engineers Inc - Kingston, ON
Project : Lasalle Causeway
Project # : BEKG009798

Lab Job No. : 09B-00785X
Report Date : 02/19/2009

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
010	Floor Tile (Grey)	50%	Calcite / Vinyl Binders	100%	01/27	DO
	Fiber Backing (Light Grey)	45%	Cellulose Fibers	50%		
			Glass Wool Fibers	10%		
			Wollastonite	5%		
			Binders / Fillers	35%		
	Cream Mastic (Cream)	5%	Glue Binders	100%		
	sample results from 09B-00785					
010b	Floor Tile (Grey)	70%	Calcite / Vinyl Binders	100%	02/19	BC
	Fiber Backing (Light Grey)	28%	Cellulose Fibers	50%		
			Glass Wool Fibers	10%		
			Wollastonite	5%		
			Binders / Fillers	35%		
	Cream Mastic (Cream)	2%	Glue Binders	100%		
010c	Floor Tile (Grey)	70%	Calcite / Vinyl Binders	100%	02/19	BC
	Fiber Backing (Light Grey)	28%	Cellulose Fibers	50%		
			Glass Wool Fibers	10%		
			Wollastonite	5%		
			Binders / Fillers	35%		
	Cream Mastic (Cream)	2%	Glue Binders	100%		
012	Floor Tile (Beige)	98%	Calcite / Vinyl Binders	100%	01/27	DO
	Black Mastic (Black)	2%	Tar Binders	100%		
	sample results from 09B-00785					
012b	Floor Tile (Beige)	98%	Calcite / Vinyl Binders	100%	02/19	BC
	Black Mastic (Black)	2%	Tar Binders	100%		
012c	Floor Tile (Beige)	98%	Calcite / Vinyl Binders	100%	02/19	BC
	Black Mastic (Black)	2%	Tar Binders	100%		
013	Acoustic Tile (Tan)	100%	Wood Fibers	100%	01/27	DO
	sample results from 09B-00785					
013b	Acoustic Tile (Tan)	100%	Wood Fibers	100%	02/19	BC
013c	Acoustic Tile (Tan)	100%	Wood Fibers	100%	02/19	BC

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Client : DST Consulting Engineers Inc - Kingston, ON
Project : Lasalle Causeway
Project # : BEKG009798

Lab Job No. : 09B-00785X
Report Date : 02/19/2009

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
014	Floor Tile (Grey)	50%	Calcite / Vinyl Binders	100%	01/27	DO
	Fiber Backing (Light Grey)	45%	Cellulose Fibers	50%		
			Glass Wool Fibers	10%		
			Wollastonite	5%		
			Binders / Fillers	35%		
	Cream Mastic (Cream)	5%	Calcite	50%		
			Glue Binders	50%		
	sample results from 09B-00785					
014b	Flooring (Grey)	60%	Calcite / Vinyl Binders	100%	02/19	BC
	Fiber Backing (Light Grey)	38%	Cellulose Fibers	50%		
			Glass Wool Fibers	10%		
			Wollastonite	5%		
			Binders / Fillers	35%		
	Cream Mastic (Cream)	2%	Calcite	50%		
			Glue Binders	50%		
014c	Flooring (Grey)	60%	Calcite / Vinyl Binders	100%	02/19	BC
	Fiber Backing (Light Grey)	38%	Cellulose Fibers	50%		
			Glass Wool Fibers	10%		
			Wollastonite	5%		
			Binders / Fillers	35%		
	Cream Mastic (Cream)	2%	Calcite	50%		
			Glue Binders	50%		
015	Acoustic Tile (Tan)	100%	Wood Fibers	100%	01/27	DO
	sample results from 09B-00785					
015b	Acoustic Tile (Tan)	100%	Wood Fibers	100%	02/19	BC
015c	Acoustic Tile (Tan)	100%	Wood Fibers	100%	02/19	BC
016	Floor Tile (Grey)	95%	Calcite / Vinyl Binders	100%	01/27	DO
	Black Mastic (Black)	5%	Tar Binders	100%		
	sample results from 09B-00785					

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Client : DST Consulting Engineers Inc - Kingston, ON
Project : Lasalle Causeway
Project # : BEKG009798

Lab Job No. : 09B-00785X
Report Date : 02/19/2009

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
016b	Floor Tile (Brown / Grey)	95%	Calcite / Vinyl Binders	100%	02/19	BC
	Black Mastic (Black)	5%	Tar Binders	100%		
016c	Floor Tile (Brown / Grey)	95%	Calcite / Vinyl Binders	100%	02/19	BC
	Black Mastic (Black)	5%	Tar Binders	100%		
017	Joint Compound (White)	100%	Calcite / Talc / Binders	100%	01/27	DO
	sample results from 09B-00785					
019	Joint Compound (White)	100%	Calcite / Talc / Binders	100%	01/27	DO
	sample results from 09B-00785					
021	Acoustic Tile (Tan)	100%	Wood Fibers	100%	01/27	DO
	sample results from 09B-00785					
021b	Acoustic Tile (Tan)	100%	Wood Fibers	100%	02/19	BC
021c	Acoustic Tile (Tan)	100%	Wood Fibers	100%	02/19	BC
027	Grey Plaster (Grey)	60%	Aggregate	65%	01/27	DO
			Calcite / Binders	35%		
	White Plaster (White)	40%	Aggregate	65%		
			Calcite / Binders	35%		
	sample results from 09B-00785					
027b	Grey Plaster (Grey)	40%	Aggregate	65%	02/19	BC
			Calcite / Binders	35%		
	White Plaster (White)	60%	Aggregate	65%		
			Calcite / Binders	35%		
027c	Grey Plaster (Grey)	40%	Aggregate	65%	02/19	BC
			Calcite / Binders	35%		
	White Plaster (White)	60%	Aggregate	65%		
			Calcite / Binders	35%		
020	Joint Compound (White)	100%	Calcite / Talc / Binders	100%	01/27	DO
	sample results from 09B-00785					
024	Acoustic Tile (Tan)	100%	Wood Fibers	100%	01/27	DO
	sample results from 09B-00785					

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Lab Job No. : 09B-00785X
Report Date : 02/19/2009

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
024b	Acoustic Tile (Tan)	100%	Wood Fibers	100%	02/19	BC
024c	Acoustic Tile (Tan)	100%	Wood Fibers	100%	02/19	BC
023	Acoustic Tile (Tan)	100%	Wood Fibers	100%	01/27	DO
	sample results from 09B-00785					
023b	Acoustic Tile (Tan)	100%	Wood Fibers	100%	02/19	BC
023c	Acoustic Tile (Tan)	100%	Wood Fibers	100%	02/19	BC
026	Grey Plaster (Grey)	100%	Aggregate	65%	01/27	DO
			Calcite / Binders	35%		
	sample results from 09B-00785					
026b	Grey Plaster (Grey)	60%	Aggregate	65%	02/19	BC
			Calcite / Binders	35%		
	White Plaster (White)	40%	Aggregate	65%		
			Calcite / Binders	35%		
026c	Grey Plaster (Grey)	60%	Aggregate	65%	02/19	BC
			Calcite / Binders	35%		
	White Plaster (White)	40%	Aggregate	65%		
			Calcite / Binders	35%		

Appendix C

Site Photographs

Photo 1: Main office building

Photo 2: Control building

Photo 3: Area of suspected mould growth on wooden storage cabinet.

Photo 4: Flammable storage cabinet with fuel and other chemicals