



**Designated Substances and
Hazardous Building Materials
Assessment – Newboro Lock
36 Rehabilitation on the
Rideau Canal**

Newboro Lock 36
10 Blockhouse Lane
Newboro ON

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Prepared for:
Public Works and Government
Services Canada
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**DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT –
NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL**

Table of Contents

Executive Summary	i
1.0 Introduction	1
2.0 Scope	1
2.1 BACKGROUND	2
3.0 Designated Substances and Hazardous Building Materials Assessment.....	2
3.1 ASBESTOS	2
3.1.1 Methodology	3
3.1.2 Findings	3
3.1.3 Recommendations	5
3.2 LEAD	5
3.2.1 Methodology	5
3.2.2 Findings	5
3.2.3 Recommendations	6
3.3 MERCURY	8
3.3.1 Methodology	8
3.3.2 Findings	8
3.3.3 Recommendations	8
3.4 SILICA	8
3.4.1 Methodology	8
3.4.2 Findings	8
3.4.3 Recommendations	8
3.5 POLYCHLORINATED BIPHENYLS	9
3.5.1 Methodology	9
3.5.2 Findings	9
3.5.3 Recommendations	9
3.6 OZONE DEPLETING SUBSTANCES	10
3.6.1 Methodology	10
3.6.2 Findings	10
3.6.3 Recommendations	10
3.7 MOULD	10
3.7.1 Methodology	10
3.7.2 Findings	10
3.7.3 Recommendations	11
3.8 UREA FORMALDEHYDE FOAM INSULATION	11
3.8.1 Methodology	11
3.8.2 Findings	12
3.8.3 Recommendations	12
3.9 RADIOACTIVE SOURCES	12
3.9.1 Methodology	12
3.9.2 Findings	12
3.9.3 Recommendations	12



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

3.10	OTHER DESIGNATED SUBSTANCES: ACRYLONITRILE, ARSENIC, BENZENE, COKE OVEN EMISSIONS, ETHYLENE OXIDES, ISOCYANATE, VINYL CHLORIDE.....	12
3.10.1	Methodology	12
3.11	CHEMICAL, FUEL OIL AND/OR WASTE OIL STORAGE	13
3.11.1	Methodology	13
3.11.2	Findings	13
3.11.3	Recommendations	13
4.0	Summary of Anticipated Abatement Activities.....	13
5.0	Limitations	13
5.1.1	Physical and Sampling Limitations	14
5.1.2	Project-Specific Limitations	15
6.0	Closure.....	15

LIST OF TABLES

Table 1:	Summary of Findings	i
Table 2:	Lead Based (>90 ppm) Paints Applications	6
Table 3:	Low Level (<90 ppm) Paint Applications.....	6
Table 4:	ODS Containing Equipment	10
Table 5:	Results of Laboratory Analysis	11
Table 6:	Summary of Anticipated Materials Requiring Abatement.....	13

LIST OF APPENDICES

APPENDIX A	DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS BACKGROUND INFORMATION AND REGULATORY FRAMEWORK
APPENDIX B	SITE PHOTOGRAPHS
APPENDIX C	FLOOR PLANS
APPENDIX D	SUMMARY OF RESULTS OF ANALYSIS OF BULK SAMPLES FOR ASBESTOS
APPENDIX E	SUMMARY OF OCCURRENCES OF ASBESTOS-CONTAINING MATERIALS
APPENDIX F	LABORATORY ANALYTICAL REPORT – ASBESTOS: POLARIZED LIGHT MICROSCOPY
APPENDIX G	SUMMARY OF RESULTS OF ANALYSIS OF PAINT CHIP SAMPLES FOR LEAD CONTENT



**DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT –
NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL**

**APPENDIX H LABORATORY ANALYTICAL REPORT – LEAD: PAINT CHIP
ANALYSIS**

**APPENDIX I LABORATORY ANALYTICAL REPORT – MOULD TAPE-LIFT
SAMPLE**

**APPENDIX J EVALUATION CRITERIA FOR ASSESSING ASBESTOS-
CONTAINING MATERIALS**



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Executive Summary

Stantec Consulting Ltd. (Stantec) was commissioned by Public Works and Government Services Canada (PWGSC) on behalf of Parks Canada (PCA) to conduct a designated substances and hazardous building materials assessment of the Newboro Lock 36 on the Rideau Canal (subject area) located at 10 Blockhouse Lane in Newboro, Ontario. The work was conducted under Standing Offer No. EQ447-190276/001/TOR.

The purpose of the assessment was to identify potential designated substances and hazardous building materials that may require special attention prior to the planned Newboro Lock 36 rehabilitation project. The work was carried out in accordance with the requirements of the Ontario *Occupational Health and Safety Act* (OHSA). The Canada Labour Code also stipulates in Part II that every employer shall ensure that the health and safety at work of every person employed by the employer is protected.

The designated substances assessment list includes those substances designated under the OHSA and included (but were not limited to) asbestos, lead, mercury, and silica as the most likely to be present. In addition to designated substances, the hazardous building materials considered in this assessment included: polychlorinated biphenyls (PCBs); ozone-depleting substances (ODSs); urea-formaldehyde foam insulation (UFFI); mould; and, radioactive sources. A visual assessment was conducted for chemical, fuel, oil and/or waste oil storage.

Based on the visual assessment and laboratory analysis, designated substances and hazardous building materials were identified to be present. Table 1 below provides a summary of the materials identified and recommendations on their management.

Table 1: Summary of Findings

Building Materials	Comments
Asbestos	<p>Friable building materials suspected to be asbestos-containing were identified by laboratory analysis to be non-asbestos-containing.</p> <p>Non-friable building materials were identified by laboratory analysis to be asbestos-containing in the form of:</p> <ul style="list-style-type: none">• Interior window (on door) glazing compound – black <p>This material was observed to be in good condition.</p> <p>The following building materials were observed to be present but not sampled, and are listed as presumed asbestos-containing materials (PACMs):</p> <ul style="list-style-type: none">• Ceramic tile grout and mortar/adhesive• Fire rated doors• Roofing materials• Roof caulking <p>These materials were observed to be in good condition. These materials were not sampled to preserve their integrity and were not sampled as they are not expected to be disturbed</p>



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Table 1: Summary of Findings

Building Materials	Comments
	<p>during the renovation activities. As these materials are known to have been manufactured with asbestos, they should be presumed to be asbestos-containing unless proven otherwise by laboratory analysis.</p>
Lead	<p>Samples of 13 paint applications were collected and submitted for lead content analysis. Seven (7) of the results indicated that the tested material contains lead in concentrations that are greater than 90 ppm as follows:</p> <ul style="list-style-type: none"> • Dark green colour paint on soffit • Dark green colour paint on door frame • Grey coloured paint on floor • Black colour paint on guardrail • Grey colour pain on grates • Grey coloured paint on lock gate • Light grey coloured paint on East lock gate <p>The remaining six (6) results were below 90 ppm:</p> <ul style="list-style-type: none"> • Beige coloured paint on wall • Light blue coloured paint on wall • Grey coloured paint on walkway • Black coloured paint on walkway • White coloured paint on walkway <p>The black coloured paint on the lock guardrails, grey coloured paint on the grates, grey, black, and white coloured paints on the lock walkway, and white and light grey coloured paints on the lock gates were observed to be in poor condition (flaking). The remaining paint applications were observed to be in good condition.</p> <p>Lead may also be present in the following materials:</p> <ul style="list-style-type: none"> • Other paint applications not tested • Older electrical wiring materials and sheathing • Solder used on domestic water lines • Solder used in bell fittings for cast iron pipes • Solder used in electrical equipment • Ceramic tile glaze • Vent and pipe flashings
Mercury	<p>Mercury vapour is likely to be present in the 30 fluorescent light tubes, light bulbs in three (3) exterior light fixtures and three (3) thermostats observed.</p> <p>Mercury may also be present in some paints and adhesives.</p>
Silica	<p>The presence of silica in building materials such as concrete, masonry, stone and ceramic tile was noted.</p>
Polychlorinated Biphenyls (PCBs)	<p>PCBs are not suspected to be present in the light ballasts within the fluorescent light fixtures, as the light fixtures observed had T8 light tubes which use electronic ballasts</p> <p>Polychlorinated Biphenyls may also be present in dielectric fluid filled electrical equipment such as motors or pumps, capacitors or transformers, plastics, molded rubber parts, applied dried paints, coatings, or sealants, caulking, adhesives, paper, sound-deadening materials, insulation, or felt and fabric products such as gaskets.</p>
Ozone-Depleting Substance (ODS)	<p>The following equipment is suspected to be ODS-containing as the labels were not accessible:</p> <ul style="list-style-type: none"> • One (1) A/C unit in the Control Building Kitchen



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Table 1: Summary of Findings

Building Materials	Comments
	<ul style="list-style-type: none">One (1) freezer unit outside of the building behind Mechanical Room 1
Mould	One (1) tape-lift sample was collected from the pipe insulation in Mechanical Room 1. Fungal growth was indicated on the insulation.
Urea Formaldehyde Foam Insulation (UFFI)	Evidence of the application of UFFI was not observed.
Other Designated Substances	Acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxides, isocyanates, and vinyl chloride are not typically a concern in building materials, and therefore these substances were not investigated.
Radioactive Sources	Evidence of radioactive sources was not observed.
Chemical, Fuel Oil and/or Waste Oil Storage	Evidence of underground storage tanks, significant chemical storage, or dumping was not observed at the property. General cleaning supplies and disinfecting chemicals were observed in Mechanical Room 1 and washroom inside the Control Building.

The statements made in this Executive Summary text are subject to the same limitations included in this report and are to be read in conjunction with the remainder of this report.

Recommendations pertaining to the handling, removal, disposal and management of identified designated substances and hazardous building materials are provided within this report.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

1.0 Introduction

Stantec Consulting Ltd. (Stantec) was commissioned by Public Works and Government Services Canada (PWGSC) on behalf of Parks Canada (PCA) to conduct a designated substances and hazardous building materials assessment of the Newboro Lock 36 on the Rideau Canal (subject area) located at 10 Blockhouse Lane in Newboro, Ontario. The work was conducted under Standing Offer No. EQ447-190276/001/TOR.

The purpose of the assessment was to identify potential designated substances and hazardous building materials that may require special attention prior to the planned Newboro Lock 36 rehabilitation project. The work was carried out in accordance with the requirements of the Ontario *Occupational Health and Safety Act* (OHSA). The Canada Labour Code also stipulates in Part II that every employer shall ensure that the health and safety at work of every person employed by the employer is protected.

The designated substances assessment list includes those substances designated under the OHSA and included (but were not limited to) asbestos, lead, mercury, and silica as the most likely to be present. In addition to designated substances, the hazardous building materials considered in this assessment included: polychlorinated biphenyls (PCBs); ozone-depleting substances (ODSs); urea-formaldehyde foam insulation (UFFI); mould; and, radioactive sources. A visual assessment was conducted for chemical, fuel, oil and/or waste oil storage.

The site work was conducted by Urvashi Vyas on May 8, 2018.

2.0 Scope

The scope of work for this assessment involved the following:

- A review of existing information, including site drawings and photographs
- A visual assessment of readily accessible areas for the presence of designated substances and hazardous building materials
- The collection of representative bulk samples from building materials suspected of containing asbestos fibres
- The collection of paint chip samples for the determination of the lead content in paint finishes
- The collection of tape-lift samples of suspected mould-impacted building materials
- Submission of samples collected for laboratory analysis
- Evaluation and interpretation of field findings and analytical results to develop conclusions and recommendations pertaining to designated substances and hazardous building materials identified to be present, including specifications for abatement removal



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

2.1 BACKGROUND

PWGSC commissioned this assessment as a measure of diligence in maintaining compliance with provincial regulations pertaining to the identification of designated substances and hazardous materials prior to the Newboro Lock 36 rehabilitation project.

Newboro Lock 36 is located at 10 Blockhouse Lane in Newboro, Ontario and consists of a one (1) level Control Building and lock system. The lock was modernized in 1966. The typical structural components and finishes associated with the Control Building consist of stone exterior walls, vinyl sheet flooring and concrete flooring, and interior wood and drywall walls with drywall ceilings.

The areas included in this assessment included the following:

- Control Building
- Lock walkway
- Grates
- Locks

Stantec was not provided with previous reports for review.

3.0 Designated Substances and Hazardous Building Materials Assessment

The results of the assessment for each of the considered designated substances and hazardous materials are provided in the following sub-sections. Refer to **Appendix A** for regulatory framework and relevant legislation with respect to designated substances and hazardous building materials.

Selected site photographs are provided in **Appendix B**.

3.1 ASBESTOS

Site drawings showing the locations of ACMs, presumed asbestos-containing materials (PACMs) and bulk samples are provided in **Appendix C**. A summary list of the bulk samples that were collected including a description of the material, sampling location, type of analysis and laboratory test results is provided in **Appendix D**.

A summary of occurrences of ACMs and PACMs is provided in **Appendix E**. Each occurrence includes the following information:

- Room component that contains ACM
- Location of the ACM within the room space
- ACM description
- Estimated quantity



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

- Original sample number or representative sample number
- Friability
- Condition

A copy of the laboratory Certificate of Analysis is provided in **Appendix F**. The evaluation criterion for assessing ACMs is provided in **Appendix J**.

3.1.1 Methodology

It is Stantec's understanding that the building and site were constructed prior to 1990. This construction time period is consistent with those dates when designated substances and hazardous building materials were commonly used.

A visual assessment of accessible areas was undertaken in order to check for the presence of materials suspected of containing asbestos. Locations to collect discrete bulk asbestos samples of suspect building materials were identified. Samples of representative materials were then collected at these locations.

A visual assessment of the condition and accessibility was completed for each occurrence of an ACM. The Public Services and Procurement Canada (PSPC) document entitled *Asbestos Management Standard* date June 2017 was used as the basis for the criteria that was applied in evaluating the presence of ACMs, where applicable.

Samples of suspect ACMs from various building materials were collected and submitted to EMSL Canada Inc. (EMSL), located in Mississauga, ON for analysis using Polarized Light Microscopy (PLM) with dispersion staining. The analysis was conducted following the U.S. EPA/600/R-93/116 Method. EMSL is certified under the National Voluntary Laboratory Accreditation Program (NVLAP) to perform asbestos analysis of bulk samples. ACMs in Ontario are defined as a material that contains 0.5 per cent or more asbestos by dry weight.

A positive stop option was used during the analysis of samples. Multiple samples of visually similar material were collected and submitted for laboratory analysis. Once a sample within the set was identified to contain asbestos, further analysis of the subsequent samples was deemed to be unnecessary and not conducted.

3.1.2 Findings

3.1.2.1 Friable Asbestos-Containing Materials

Friable building materials suspected to be asbestos-containing were identified by laboratory analysis to be non-asbestos-containing.

3.1.2.2 Non-Friable Asbestos-Containing Materials

Non-friable building materials were observed to be present and identified by laboratory analysis to contain asbestos in the form of:



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

- Interior window (on door) glazing compound – black

This material was observed to be in good condition. This material is not expected to be impacted by the renovations. No further action is indicated.

3.1.2.3 Presumed Asbestos-Containing Materials

The following building materials were observed to be present but not sampled, and are listed as PACMs:

- Ceramic tile grout and mortar/adhesive
- Fire rated doors
- Roofing materials
- Roof caulking

These materials were observed to be in good condition. These materials were not sampled to preserve their integrity and these materials are not expected to be impacted by the planned renovations. As these materials are known to have been manufactured with asbestos, they should be presumed to be asbestos-containing unless proven otherwise by laboratory analysis.

3.1.2.4 Non-Asbestos-Containing Materials

A summary list of the bulk samples collected during this assessment and confirmed to be non-ACMs by laboratory analysis is provided in **Appendix D**.

3.1.2.5 Potential for Vermiculite Insulation

Based on building construction vermiculite is not suspected to be present.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

3.1.3 Recommendations

Asbestos-containing window glazing is not expected to be impacted by the renovations. Asbestos abatement and the materials can be managed in place.

Presumed asbestos-containing materials (ceramic tile grout and mortar/adhesive, fire rated doors, roofing materials, and roof caulking) are not expected to be disturbed during the renovations. During the renovations if the identified PACMs are to be impacted, prior to disturbance the materials should be tested for asbestos. Confirmed asbestos materials should be handled accordingly in accordance with O. Reg. 278/05.

Should a material suspected to contain asbestos fibres become uncovered during the renovation activities, all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if asbestos fibres are present. Confirmed asbestos materials should be handled accordingly in accordance with O. Reg. 278/05.

This report should be added to the asbestos management program and referred to as the current asbestos record for the site.

3.2 LEAD

3.2.1 Methodology

A visual assessment of accessible areas was undertaken in order to check for the presence of materials that may contain lead. These materials included paint applications, wiring and plumbing etc.

Representative paint samples were collected and submitted to EMSL for lead content analysis by Flame Atomic Absorption Spectrophotometry, following US EPA Method No. 7420.

The sampling of paint applications involved the collection of paint chip samples of paint layers to the substrate. A minimum volume of 5 cc or ½ teaspoon of paint chips was typically collected. Wherever necessary and possible, paint was separated from any backing material such as paper, concrete or wood and placed in a sealed clearly labelled plastic bag.

A summary list of the samples collected including a description of the samples, sampling locations and laboratory analytical results is provided in **Appendix G**. The sampling locations are indicated on the floor plans provided in **Appendix C**.

3.2.2 Findings

Thirteen (13) samples of major paint applications were collected in the form of paint chip samples and submitted to EMSL for lead content analysis. PWGSC uses 90 ppm as the criteria to manage paint applications as lead-containing paints. A copy of the laboratory Certificate of Analysis for the paint chip testing is included in **Appendix H**.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Based on the laboratory results, the following paint applications contain lead in concentrations greater than the Federal Canada Consumer Product Safety Act's limit of 90 ppm.

Table 2: Lead Based (>90 ppm) Paints Applications

Paint Applications	Lead Concentration, ppm	Condition
Dark green colour paint on soffit	26,000 ppm	Good
Dark green colour paint on door frame	25,000 ppm	Good
Grey coloured paint on floor in Mechanical room	17,000 ppm	Good
Grey colour pain on grates	4,800 ppm	Flaking
Grey coloured paint on lock gate	2,000 ppm	Flaking
Black colour paint on lock guardrail	740 ppm	Flaking
Light grey coloured paint on East lock gate	640 ppm	Flaking

Based on the laboratory results, the following paint applications contain lead in concentrations less than 90 ppm.

Table 3: Low Level (<90 ppm) Paint Applications

Paint Applications	Lead Concentration	Condition
Beige coloured paint on wall	<88 pm	Good
Light blue coloured paint on wall	<90 ppm	Good
White coloured paint on wall	<88 ppm	Good
Grey coloured paint on walkway	<88 pm	Flaking
Black coloured paint on walkway	<84 pm	Flaking
White coloured paint on walkway	<82 pm	Flaking

Lead may also be present in the following materials:

- Other paint applications not tested
- Older electrical wiring materials and sheathing
- Solder used on domestic water lines
- Solder used in bell fittings for cast iron pipes
- Solder used in electrical equipment
- Ceramic tile glaze
- Vent and pipe flashings

3.2.3 Recommendations

Work that may disturb any lead-containing paints should follow the recommendations provided in the document entitled:



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

- Ministry of Labour *Guideline: Lead on Construction Projects*
- *EACO Lead Guideline for Construction, Maintenance or Repair*, dated October 2014

These documents outline the following with respect to lead: Legal Requirements, Health Effects, Controlling the Lead Hazard, Classification on Work (Class 1, Class 2, Class 3) and Measures and Procedures for Working with Lead.

Minimum lead precautions are to be followed when performing the following Class 1 operations on lead-containing paint applications.

- Removal of lead based coatings with a chemical gel or paste and fibrous laminated cloth wrap
- Removal of lead based coatings or materials using a power tool with an effective dust collection system equipped with a HEPA filter.
- Removal of lead based coatings or materials with non-powered hand tool, other than manual scraping and sanding.

Moderate lead precautions are to be followed when performing the following Class 2 operations on lead-containing paint applications.

- Removal of lead based paint from by scraping or sanding using non-powered hand tools.

Maximum lead precautions are to be followed when performing the following Class 3 operations on lead based paint and lead containing paint applications.

- Removal of lead based paint from using power tools without an effective dust collection system equipped with HEPA filter.
- Abrasive blasting of lead based paint.

The work tasks required and the ways in which lead based paints will be impacted will determine the appropriate respirators, measures and procedures that should be followed to protect workers from lead exposure, and protect the natural environment including soils, water, and other adjacent surfaces. This is to be determined by the Contractor through their own Risk Assessment.

Actions that will disturb lead-containing materials, including paints and materials are to be conducted in such a manner to keep airborne exposure to lead dust to less than limit in O. Reg. 490/09 respecting Designated Substances - Lead made under the Occupational Health and Safety Act as amended by O. Reg. 148/12 and O. Reg. 149/12.

Materials containing lead should be subject to toxicity characteristic leaching procedure (TCLP) testing to determine toxicity with respect to lead prior to disposal in accordance with R.R.O. 1990, Regulation 347 General - Waste Management, as amended (R.R.O. 1990, Reg. 347) under the Environmental Protection Act (EPA).



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

3.3 MERCURY

3.3.1 Methodology

A visual assessment for the presence of mercury-containing equipment was conducted.

3.3.2 Findings

Mercury is likely to be present in fluorescent 30 fluorescent light tubes, light bulbs in three (3) exterior light fixtures and three (3) thermostats observed. Mercury may also be present in paints and adhesives.

3.3.3 Recommendations

Mercury vapour within light fixtures or other equipment such as thermostats poses no risk to workers or occupants provided the mercury containers remain intact and undisturbed. Complete removal of mercury-containing equipment is required prior to renovation activities that may disturb the equipment. Prior to renovation work that would distribute the light tubes and thermostats must be removed and stored in a safe, secure location or disposed of following the requirements of R.R.O. 1990, Reg. 347 under the EPA.

3.4 SILICA

3.4.1 Methodology

An assessment for the presence of silica was conducted. Silica can be present in building materials such as concrete, masonry, stone, terrazzo, refractory brick, ceramic tile, ceiling tile, etc.

3.4.2 Findings

Silica is expected to be present in concrete, masonry, stone, and ceramic tile observed in various locations.

3.4.3 Recommendations

The classification of work determines the appropriate respirators, measures and procedures that should be followed to protect workers from silica exposure. Precautions should be taken as required during renovation projects impacting materials expected to contain silica (i.e., coring through concrete slabs, demolition of masonry or concrete units, ceramic tiles, brick, etc.) where dust may be generated.

Work that may disturb silica-containing materials should follow the recommendations provided in the document entitled:

- *Guideline: Silica on Construction Projects*, issued by the MOL, dated April 2011

The Guideline outlines: legal requirements, health effects, controlling the silica hazard, classification on work and measures, and procedures for working with silica.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

The Guideline: Silica on Construction Projects defines the classification of work. It is the classification of the work that determines the appropriate respirators, measures and procedures that should be followed to protect the worker from silica exposure. In this guideline, silica-containing construction operations are classified into three groups, Type 1, Type 2, and Type 3 operations, and can be thought of as being of low, medium, and high risk. From Type 1 to Type 3 operations, the corresponding respirator, and measures and procedures become increasingly stringent.

Silica is included in O. Reg. 490/09 and the regulation provides information on the application of the regulation as well as allowable exposure levels, where the maximum TWA for respirable airborne silica (cristobalite) dust is 0.05 mg/m³ and 0.01 mg/m³ for quartz/Tripoli. However, the more stringent level of 0.025 mg/m³ for respirable crystalline silica (quartz, cristobalite) applies as noted in the ACGIH 2018 TLVs for Chemical Substances and Physical Agents. The assessment and control program and medical surveillance requirements are for non-construction projects as defined in O. Reg. 490/09. Refer to the document entitled *Guideline: Silica on Construction Projects*, issued by the MOL in April 2011 for safe silica work practices and personal protective equipment (PPE).

3.5 POLYCHLORINATED BIPHENYLS

3.5.1 Methodology

A visual review for the presence of PCBs in electrical equipment was completed. Equipment that is generally suspected of containing PCBs includes lamp ballasts, transformers, hydraulic systems, compressors, switchgear and capacitors.

3.5.2 Findings

PCBs are not suspected to be present in the light ballasts within the fluorescent light fixtures, as the light fixtures observed had T8 light tubes which use electronic ballasts.

PCBs may also be present in dielectric fluid filled electrical equipment such as motors or pumps, capacitors or transformers, plastics, molded rubber parts, applied dried paints, coatings, or sealants, caulking, adhesives, paper, sound-deadening materials, insulation, or felt and fabric products such as gaskets.

3.5.3 Recommendations

Should a material suspected to contain PCBs become uncovered during renovation activities (i.e., dielectric fluids, hydraulic fluids), all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if PCBs are present. Confirmed PCBs should be handled in accordance with Federal Regulation SOR/2008-273 and R.R.O. 1990, Reg. 362, under the EPA.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

3.6 OZONE DEPLETING SUBSTANCES

3.6.1 Methodology

An assessment for equipment likely to contain ODSs was completed. Information on the type of equipment, manufacturer and type and quantity of refrigerants was recorded, where available.

3.6.2 Findings

The following equipment is suspected to be ODS-containing as the labels were not accessible:

Table 4: ODS Containing Equipment

Equipment	Location	Refrigerant
AC Unit (1 unit)	Control Building, Kitchen	Suspect ODS-containing
Freezer Unit (1 unit)	Exterior of Mechanical Room 1	Suspect ODS-containing

Floor plans showing the locations of the suspect ODS-containing equipment are provided in **Appendix C**.

3.6.3 Recommendations

Suspect ODS-containing equipment identified can be managed in place and must be serviced by licensed refrigeration technicians.

When refrigeration equipment that is confirmed or suspected to be ODS-containing is decommissioned, it should be inspected by a refrigeration mechanic certified under Section 34 of O. Reg. 463/10 of the EPA.

3.7 MOULD

3.7.1 Methodology

An assessment for the potential presence of mould was completed. This involved a visual assessment of accessible surfaces for obvious evidence of mould, moisture or water damage.

A tape lift sample was collected from materials that were visibly or potentially impacted by mould. The sample was submitted to Sporometrics Inc. (Sporometrics) of Toronto for laboratory examination (direct microscopic analysis) of the mould forms present. Sporometrics has been accredited by the American Industrial Hygiene Association (AIHA) Environmental Microbiology Laboratory Accreditation Program and participates in the AIHA Environmental Microbiology Proficiency Analytical Testing (EMPAT) Program.

3.7.2 Findings

One (1) tape lift sample of suspect mould-impacted pipe insulation was collected. The laboratory analytical results are noted in Table 2, below. A copy of the Laboratory Analysis is provided in **Appendix I**.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Table 5: Results of Laboratory Analysis

Sample No.	Location	Microscopic Observations		Microscopic Observations (Rating)	Growth Indicated (Y/N)
MS-01	Control Building, Mechanical Room 1, Pipe Insulation	<i>Alternaria (Ulocladium) NOS</i>	mycelia	tr	Y
			spores	1+	
		<i>Aspergillus/Penicillium NOS</i>	mycelia	-	
			spores	tr	
		<i>Cladosporium NOS</i>	mycelia	2+	
			spores	3+	
basidiospores NOS			tr		
Tr = 10 ⁰ – 10 ¹ elements in total; 1+ = 10 ⁰ – 10 ¹ elements in each of ~25% fields; 2+ 10 ⁰ – 10 ² elements in each of ~25% fields; 3+ = 10 ⁰ – 10 ³ elements in each of ~75 fields; 4+ =>75% fields obscured					

Mould growth was identified through laboratory analysis in the Mechanical room on the pipe insulation. Approximately one (1) meter square was identified at the time of the assessment.

3.7.3 Recommendations

Mould Remediation depends primarily on the scale, or size, of the mould growth. Mould growth is classified as small (Level I), medium (Level II), or large (Level III), with appropriate measures or procedures established for each level.

It is anticipated that the pipe insulation may be disturbed during the project. The mould observed was less than one (1) square meter and should be remediated in accordance with procedures for small scale (Level 1) mould growth in accordance with the documents entitled:

- *CCA Mould Guidelines for the Canadian Construction Industry*, dated 2004
- *EACO Mould Abatement Guidelines*, dated 2010

Remediation should be done by a competent person, who is knowledgeable of potential hazards of mould exposure, following remediation precautions.

3.8 UREA FORMALDEHYDE FOAM INSULATION

3.8.1 Methodology

An assessment for the potential presence of UFFI was completed. This involved the assessment of exterior and interior walls for evidence of repaired openings (i.e., nozzle holes) made to facilitate the installation of the insulation. Wherever possible, an assessment of wall cavities through existing openings was made.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

3.8.2 Findings

Evidence of the application of UFFI was not observed to be present.

3.8.3 Recommendations

As evidence of the application of UFFI was not observed, no recommendations have been provided.

3.9 RADIOACTIVE SOURCES

3.9.1 Methodology

An assessment for the presence of radioactive sources within smoke detectors was completed.

3.9.2 Findings

Evidence of radioactive smoke detectors was not observed to be present.

3.9.3 Recommendations

As evidence of radioactive sources was not observed, no recommendations have been provided.

3.10 OTHER DESIGNATED SUBSTANCES: ACRYLONITRILE, ARSENIC, BENZENE, COKE OVEN EMISSIONS, ETHYLENE OXIDES, ISOCYANATE, VINYL CHLORIDE

3.10.1 Methodology

Designated substances including acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxides, isocyanates, and vinyl chloride are not typically a concern in building materials as they are bound in manufactured products and therefore these substances were not investigated. However, some common sources are listed below.

- Acrylonitrile may be present in stable form in paints and adhesives.
- Arsenic or arsenic compounds may be present in paints and adhesives.
- Benzene as a constituent of hydrocarbon-based mixtures and is present in a stable form in roofing materials, paints, and adhesives. Benzene in these forms is not expected to be of a worker exposure concern.
- Uncured Isocyanate may be present in paint finishes, varnishes, polyurethane plastics, synthetic rubbers, foams, and adhesives.
- Vinyl chloride (monomer) is generally likely to be present in stable form within the PVC piping and conduits, where applicable.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

3.11 CHEMICAL, FUEL OIL AND/OR WASTE OIL STORAGE

3.11.1 Methodology

A visual assessment for chemical storage, fuel, oil and/or waste oil storage was conducted.

3.11.2 Findings

No evidence of underground storage tanks, significant chemical storage, or dumping was observed at the property. General cleaning supplies and disinfecting chemicals were observed in Mechanical Room 1 and washroom inside the Control Building.

3.11.3 Recommendations

Prior to renovations, chemicals should be removed and stored in a safe, secure location in accordance with the Work Place Hazardous Materials Information System or removed and disposed of following the requirements of R.R.O. 1990, Reg. 347 under the EPA.

4.0 Summary of Anticipated Abatement Activities

The table below summarized the materials that are anticipated to require abatement activities based on the findings of the designated substances and hazards building materials assessment.

Table 6: Summary of Anticipated Materials Requiring Abatement

Designated Substance and Hazardous Materials	Area of Concern
Lead	Dark green colour paint on soffit Dark green colour paint on door frame Grey coloured paint on floor in Mechanical room Grey colour pain on grates Grey coloured paint on lock gate Black colour paint on lock guardrail Light grey coloured paint on East lock gate
Mould	Pipe Insulation in Mechanical Room 1, Control Building
Silica	Concrete, masonry, and stone

5.0 Limitations

This report reflects the observations made within accessed areas and the results of analyses performed on specific materials sampled, as indicated herein. Analytical results reflect the sampled materials at the specific sampling locations.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

5.1.1 Physical and Sampling Limitations

Sampling was conducted pertaining to suspected asbestos-containing materials (ACMs), suspected lead-containing paints (LCPs) and suspect mould only. The assessment for the presence of other designated substances and hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible spaces only. Concealed spaces were assessed via existing access panels, where present. Interior and exterior finishes, solid ceilings, walls, flooring and structural elements were not removed to access concealed areas.

Due to limitations on the agreed to scope of work for this project as well as physical limitations in accessing concealed areas and limitations associated with working in occupied/operational spaces, there are specific limitations to the information that can be provided to each hazardous building material considered in this assessment, as outlined below the presence and the asbestos content of some building materials could neither be confirmed nor denied.

Building materials that may contain asbestos but were not accessible for sampling include, but are not limited to the following:

- Roofing materials
- Sub-grade materials (e.g., asbestos cement drainage pipe)
- Flooring material concealed beneath existing sub-floors
- Insulation material present inside walls (e.g., suspected asbestos-containing vermiculite insulation inside concrete block and/or brick walls)
- Drywall and/or wall plaster and associated finish materials concealed behind new and/or additional walls
- Woven tape inside duct connection joints
- Mechanical (e.g., piping and ducting) insulation within wall cavities, crawlspaces tunnels or other concealed or confined spaces
- Insulation materials inside building materials, including fire doors and window frames
- Heating, ventilation and air conditioning (HVAC) units mechanical inner linings and/or inner ducting insulation
- Heat protection and insulating materials inside mechanical and electrical installations and light fixtures
- Ceramic tile grout and mortar/adhesive concealed behind ceramic tiles

Samples of paint applications suspected to contain lead were collected from surfaces of major paint applications where visually different paint colours and/or types were identified. Although the surfaces where samples were collected may be covered with more than one coat of paint, the paint samples are described by the surface (visible) colour only. Attempts were made to represent all layers of paint in the samples collected. As analytical results are referenced to the surface paint colour only, the lead content of all painted surfaces similar to that represented by the surface paint colour will be presumed to be the same, regardless of differing sub surface paints, if any.

The presence of mercury or mercury-containing equipment in inaccessible areas or as internal parts of HVAC mechanisms or other equipment, was not assessed.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Conclusions and recommendations regarding the presence of PCBs are based on limited observations and information provided regarding lighting renovations and is presented to provide guidance regarding the likelihood that PCB-containing equipment is or is not present. The exact extent and/or number of fluorescent lamp ballasts containing PCBs, if any, will not be commented on.

The assessment was limited to a visual review in accessed areas of readily accessible building-related cooling and refrigeration equipment which could contain ODSs. Testing was not conducted. Equipment or materials that were not included as part of this assessment but that may contain ODSs include, but are not limited to portable equipment, including domestic-type refrigerators and water coolers, tenant-related refrigeration equipment, flexible plastic foam or rigid insulation foam, solvents, aerosol spray propellants and fire extinguishing equipment.

Visual assessment for the presence of suspected visible mould and/or suitable conditions for mould growth (e.g., moist and/or water-stained building materials) were conducted. The conclusions made in this report provide description(s) of the potential source(s) of moisture that may have led to suitable conditions for mould growth, only in those cases where potential source(s) of moisture were identified. Tape-lift samples were collected where suspect mould was identified. These conclusions will not necessarily identify all sources of moisture leading to suitable conditions for mould growth within the impacted area(s). This assessment does not constitute a building envelope/building systems assessment, which would include an intrusive investigation to assess the internal condition, potential moisture sources, and expected remaining service life of the various components and systems comprising the envelope of a building.

In general, the assessment for the presence of other designated substances and hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible accessed spaces only. The potential presence of hazardous building materials in inaccessible areas not assessed includes, but is not limited to: ceiling spaces, wall cavities, crawlspaces, and buried materials.

5.1.2 Project-Specific Limitations

The roof was not accessed as it is not expected to be impacted by renovations.

6.0 Closure

This report has been prepared for the sole benefit of Public Works and Government Services Canada on behalf of Parks Canada. The report may not be used by any other person or entity without the express written consent of Stantec Consulting Ltd. and Parks Canada and Public Works and Government Services Canada.

Any use which a third party makes of this report, or any reliance on decisions based on it, is the responsibility of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

The information and conclusions contained in this report are based upon work undertaken by trained professionals and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. Conclusions presented in this report should not be construed as legal advice.

The conclusions presented in this report represent the best technical judgment of Stantec Consulting Ltd. based on the data obtained from the work.

The conclusions are based on the site conditions encountered by Stantec Consulting Ltd. at the time the work was performed at the specific assessment and/or sampling locations, and can only be extrapolated to an undefined limited area around these locations. The extent of the limited area depends on building construction and conditions, weather, building usage and other factors. Due to the nature of the investigation and the limited data available, Stantec Consulting Ltd. cannot warrant against undiscovered environmental liabilities.

If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

We trust that the above is satisfactory for your purposes at this time. Should you have any questions or concerns, or require additional information, please do not hesitate to contact the Stantec Project Manager at your convenience.

This report was prepared by Urvashi Vyas and reviewed by Linda Fleet and Martin Ling.

Regards,

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DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Appendix A

Designated Substances and Hazardous Building Materials Background Information and Regulatory Framework

APPENDIX A

DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS BACKGROUND INFORMATION AND REGULATORY FRAMEWORK



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Appendix A

Designated Substances and Hazardous Building Materials Background Information and Regulatory Framework

A.1 DESIGNATED SUBSTANCES

Asbestos

Asbestos is typically found in plaster, mechanical insulation, gaskets, thermal insulation on pipes, refractory material, roofing felts, floor tiles, ceiling tiles and parging, heat resistant panels, incandescent light fixture reflector plates, and any other material requiring a high degree of durability or thermal resistance. The common use of potential (breakable by hand) asbestos-containing materials (ACMs) in construction ceased voluntarily in the mid-1970s; however, the spray application of asbestos-containing fireproofing was not prohibited until 1986.

Asbestos-containing materials are grouped into two classifications, friable and non-friable materials. Friable ACMs are those that can easily be crumbled or broken apart by mere hand pressure. When these materials break apart asbestos fibres are then released into the atmosphere. Non-friable ACMs or “manufactured products” are materials that by the nature of their manufacturing/construction do not readily allow the release of asbestos fibres. These materials should not be cut or shaped with power tools, since this procedure may allow for the release of the asbestos fibres. Some materials or “manufactured products”, such as plaster, drywall and ceiling tiles that are considered to be non-friable in an undisturbed state can become friable when damaged or disturbed. These are often referred to as “potentially” friable materials.

Ontario Regulation 490/09 Designated Substances (O. Reg. 490/09), as amended, under the Ontario Occupational Health and Safety Act (OHSA) primarily regulates worker exposure to asbestos during manufacturing of asbestos-containing products, but also includes requirements related to respiratory equipment, measurement of airborne fibres, and medical surveillance of exposed workers.

Ontario Regulation R.R.O 1990, Regulation 833, Control of Exposure to Biological or Chemical Agents, as amended (R.R.O. 1990, Reg. 833) made under the OHSA, sets the same time weighted average limit (TWA) value based on 8-hour work days.

Ontario Regulation 278/05 Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05), as amended, made under the OHSA defines an ACM as a material that contains 0.5% per cent or more asbestos by dry weight. Ontario Regulation 278/05 requires that an Asbestos Management Program (AMP) be implemented in buildings that have been identified to contain asbestos. The Canada Labour Code also stipulates in Part II that every employer shall ensure that the health and safety at work of every person employed by the employer is protected.

The general waste management regulation for the province of Ontario *R.R.O. 1990, Regulation 347 General - Waste Management*, as amended (R.R.O. 1990, Reg. 347) sets out the requirements for the proper disposal of asbestos waste in Ontario. The waste must be placed in a double sealed container, properly labelled, free of cuts, tears or punctures and disposed of at a licensed waste station which has been properly notified of the shipment(s) of asbestos waste. Asbestos waste must be hauled in a vehicle operating under a Certificate of Approval (CofA) from the Ontario Ministry of the Environment and Climate



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Appendix A

Designated Substances and Hazardous Building Materials Background Information and Regulatory Framework

Change (MOECC). The vehicle must have a trained operator as well as an asbestos spill kit. The asbestos waste must be immediately buried at the licensed landfill operation operating under a CofA from the MOECC.

The transport of asbestos waste to the disposal site is covered by the federal *Transportation of Dangerous Goods Act*. Asbestos waste is to be transported in a proper vehicle with appropriate placards and transportation numbering.

Lead

Lead may be used in its pure metallic form or combined chemically with other elements to form lead compounds. Metallic lead is used to make products such as electric storage batteries, ammunition, lead solder, radiation shields, pipes, and sheaths for electric cables. Metallic lead is sometimes combined with other metals such as copper, tin and antimony as lead alloys for use in the manufacture of a variety of metal products.

Organic lead compounds contain a lead atom covalently bonded to carbon. Common examples of organic lead compounds include lead “soaps” such as lead oleates, high pressure lubricants, and anti-knock agents in gasoline.

Inorganic lead compounds (or lead salts) result when lead is combined with an element other than carbon. Examples are lead oxide, lead chromate, lead carbonate and lead nitrate. Inorganic lead compounds may occur as solids or in solutions, and are used in insecticides, pigments, paints, frits, glasses, plastics, and rubber compounds.

Lead may affect the health of workers if it is in a form that may be inhaled, ingested or absorbed through the skin. Lead dust consists of small, solid particles of metallic lead or lead compounds that are generated by sanding, grinding, polishing, and sawing operations. Lead fume is produced in significant amounts when solid lead or materials containing lead are heated to temperatures above 500° C, as in welding and flame cutting or burning.

The United States Department of Housing and Urban Development (HUD) set a criteria of lead-based paint as 0.5% lead (by weight) or 5,000 parts per million (ppm) for evaluating whether lead is a hazard in a residential setting.

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the Federal Hazardous Products Act provides a concentration of lead that must not be exceeded in surface coatings that are presently sold in this country. This value has recently been reduced from 600 ppm to 90 ppm. However, it is important to note that there is not a direct correlation between the concentration of lead in a material to the potential occupational exposure if the material is disturbed. For the purposes of this report, and material with >90 ppm of lead is considered as lead-containing.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Appendix A

Designated Substances and Hazardous Building Materials Background Information and Regulatory Framework

O. Reg. 490/09 (which does not apply to construction projects) and R.R.O. 1990 Reg. 833, an occupational exposure limit (OEL) for airborne lead dust or fumes has been set at the TWA value of 0.05 milligram per cubic metre of air (mg/m^3) for workers. The TWA 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.

The EACO document entitled *Lead Guideline for Construction, Renovation Maintenance or Repair*, issued October 2014 sets out guidelines for operations involving the handling, application, removal, disturbance or clean-up of lead-containing materials. The guideline is intended for the environmental abatement industry, construction industry and painting industry in general and is based on industry standard best-practices for lead abatement and dust control measures.

The Ontario Ministry of Labour (MOL) document entitled *Guideline: Lead on Construction Projects*, issued by the MOL in April 2011, states that the removal of lead paint is not required unless work on these materials are likely to produce airborne lead dust or fumes, for example during welding, torch cutting, sanding and sand blasting. If these operations are likely to occur during building renovations or demolition, it is recommended that the removal of lead paint be carried out in accordance with procedures outlined in the proposed regulation.

Although the TWA and some other requirements under O. Reg. 490/09 and R.R.O. 1990 Reg. 833 do not apply to construction projects, procedures that provide the equivalent level of protection should be implemented on such projects where exposure to lead is possible.

Mercury

Mercury is commonly found in buildings, as it is contained in mercury vapour lighting, thermostats, thermometers, and electrical mercury switches. If mercury is exposed to the air, odourless vapours are formed. The regulated occupational exposure limit for airborne mercury is $0.025 \text{ mg}/\text{m}^3$ (8-hour TWA) as prescribed in (O. Reg. 490/09) and R.R.O. 1990 Reg. 833.

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the Federal Hazardous Products Act provides a concentration of mercury that must not be exceeded in surface coatings that are presently sold in this country. This value was set at 10 ppm in 2005. However, it is important to note that there is not a direct correlation between the concentration of mercury in a material to the potential occupational exposure if the material is disturbed.

Mercury is hazardous if it is inhaled or absorbed through the skin, therefore exposure controls (including both respiratory protection and skin protection) are important to consider.

Mercury disposal should be through a scrap dealer (elemental mercury), recycling firm for mercury vapour and returned to the manufacturer for light tubes and fixtures.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Appendix A

Designated Substances and Hazardous Building Materials Background Information and Regulatory Framework

Mercury is included in O. Reg. 490/09 and applies to every employer and worker at a workplace where mercury is present, produced, processed, used, handled, or stored and at which the worker is likely to inhale, ingest, or absorb mercury (the maximum TWA for airborne mercury is 0.025 mg/ m³).

Requirements related to exposure to mercury are detailed, including those relating to worker safety and the use of personal protective equipment.

Ontario's Waste Management (R.R.O. 1990, Reg. 347) under the *Environmental Protection Act* (EPA) provides directives for the disposal of hazardous materials such as mercury.

Silica

Silica, also referred to as free crystalline silica, is found in concrete, cement, mortar, ceramic wall and floor tiles, stucco finishes and acoustic ceiling tiles. Prolonged exposure to, and inhalation of free crystalline silica, may result in respiratory disease known as silicosis, which is characterized by progressive fibrosis of the inner lung tissue and marked shortness of breath or impaired lung function. The maximum TWA for airborne Silica dust is 0.05 mg/ m³ (O. Reg. 490/09 and R.R.O. 1990, Reg. 833). However the more stringent level of 0.025 mg/m³ for respirable crystalline silica (quartz, cristobalite) applies as noted in the ACGIH 2018 TLVs for Chemical Substances and Physical Agents.

Silica is included in O. Reg. 490/09 and the regulation provides information on the application of the regulation. The assessment and control program and medical surveillance requirements are for non-construction projects as defined in O. Reg. 490/09. Refer to the document entitled *Guideline: Silica on Construction Projects*, issued by the MOL in April 2011 for safe silica work practices and personal protective equipment (PPE).

Acrylonitrile

Acrylonitrile is a clear liquid that may be colourless or yellow and that readily reacts with other chemicals to produce long, chain-like molecules (polymers). Acrylonitrile-based polymers are used to produce nitrile rubbers, plastics, acrylic fibres, coatings and adhesives. Workers are typically exposed to acrylonitrile at manufacturing facilities that produce the aforementioned products through inhaling its vapour, direct skin contact, or through ingestion. Although acrylonitrile may be present in some of the building materials, including adhesives and coatings, the chemical will likely be bonded in the polymer form. Therefore, it is not expected that an adverse exposure to acrylonitrile will occur unless the building materials are heated to extreme temperatures. Acrylonitrile vapours may become released from the acrylonitrile-based polymers during a process where high temperatures are applied.

The TWA for a worker with respect to Acrylonitrile is 2 ppm as prescribed in O. Reg. 490/09 and R.R.O. 1990 Reg. 833. The Short term Exposure Limit (STEL) for Acrylonitrile is 10 ppm for any 15-minute exposure period.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Appendix A

Designated Substances and Hazardous Building Materials Background Information and Regulatory Framework

Arsenic

The presence of arsenic in the paint coating on interior and exterior finishes is possible. As the painted surfaces will be handled as per the proposed lead regulation, it is not expected that arsenic concentrations in the air will exceed the TWA for a worker to arsenic ($10 \mu\text{g}/\text{m}^3$) as prescribed by O. Reg. 490/09 and R.R.O. 1990, Reg. 833. The STEL for arsenic is $50 \mu\text{g}/\text{m}^3$ for any 15-minute exposure period.

Benzene

Historically, benzene has been produced as a by-product of coal gasification and metallurgical coke production in steel making. The light oil product from such processes contains benzene, toluene, ethyl benzene and xylene, and these components are separated by distillation. Today, most benzene is produced from the refining of petroleum.

Benzene has applications as a solvent in synthetic rubber manufacturing and processing, and in paints, varnishes, stains, adhesives, roofing materials and sealants. The use of benzene in tire and other rubber goods manufacturing and as a solvent and component of paints and adhesives has declined considerably as a result of concerns about workplace exposure. Nevertheless, it is often present in trace quantities in petroleum and aromatic solvents, some of which have replaced benzene in many uses. Benzene is also a minor component of gasoline mixtures sold in Canada.

The TWA for a worker to benzene is 0.5 ppm as prescribed by O. Reg. 490/09 and R.R.O. 1990, Reg. 833. It is possible that benzene was present in the paints, adhesives and roofing materials used during the original construction of many buildings. However, over time, the benzene component typically volatilizes out of the paints, solvents and roofing bitumens and is released into the ambient air. Therefore, it is likely that only trace levels of benzene presently exist in these building materials. It is not expected that benzene emissions from any existing building materials on site will exceed the allowable TWA. The STEL for benzene is 2.5 ppm for any 15-minute exposure period.

Coke Oven Emissions

Coke oven emissions are found in the exhaust from the burning process of coke, and are typically not a concern in buildings. The TWA for a worker with respect to coke oven emissions is $150 \mu\text{g}/\text{m}^3$ as prescribed by O. Reg. 490/09 and R.R.O. 1990, Reg. 833.

Ethylene Oxides

Ethylene oxide is a common by product of fumigation or sterilization procedures.

The TWA for a worker with respect to ethylene oxides is 1 ppm as prescribed in O. Reg. 490/09 and R.R.O. 1990, Reg. 833. The STEL for ethylene oxides is 10 ppm for any 15-minute exposure period.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Appendix A

Designated Substances and Hazardous Building Materials Background Information and Regulatory Framework

Isocyanates

Isocyanates are a class of chemicals used in the manufacture of certain types of plastics, foams and roof insulation. The isocyanate (-CNO) group reacts very readily with certain other types of molecules, a property responsible for the usefulness of isocyanates in industry. Due to the high reactivity of the isocyanate group, exposure to isocyanates can result in primary irritation, sensitization and hypersensitivity reactions. The respiratory system, the eyes and the skin are the main areas affected by exposure. Isocyanates in their initial form are found as a vapour, a mist, or a dust which become airborne and then taken into the body. Once the isocyanates are chemically bonded to other chemicals during manufacturing processes, the isocyanates are not readily available to become airborne unless heated. Therefore, isocyanate exposure is not expected to be a concern as long as the burning of plastics, foams, and insulation is not carried out.

The TWA for a worker with respect to isocyanates, organic compounds is 5 parts per billion (ppb) as prescribed in O. Reg. 490/09 and R.R.O. 1990, Reg. 833. The STEL for isocyanates, organic compounds is 20 ppb for any 15-minute exposure period.

Vinyl Chloride

Vinyl chloride is found in many applications in building such as plumbing pipes, protective coatings on insulated pipes and interior finishes (i.e., vinyl baseboard trim). Vinyl chlorides in the above materials are bound in a solid matrix and are unlikely to become airborne such that it would exceed the maximum allowable TWA of 1 ppm, as prescribed in O. Reg. 490/09 and R.R.O. 1990, Reg. 833.

A.2 HAZARDOUS BUILDING MATERIALS

Polychlorinated Biphenyls (PCBs)

The use of PCBs in electrical equipment such as transformers and capacitors, including capacitors found in fluorescent lamp ballasts, was common up to 1980. R.R.O 1990 Regulation 362 Waste Management – PCB's (R.R.O. 1990, Reg. 362) under the EPA, prohibits the use of PCBs in electrical equipment installed after July 1, 1980.

The TWA for a worker with respect to PCBs is 0.05 mg/ m³ as prescribed in R.R.O. 1990, Reg. 833.

As of September 5, 2008, under Subsection 93(1) of the *Canadian Environmental Protection Act*, (CEPA), Federal PCB regulations have been published by the Canada Gazette Part II (SOR/2008-273) that impose specific deadlines for the elimination of all PCBs in concentrations at or above 50 milligrams/kilogram (mg/kg). The regulation requires the elimination of all PCBs and PCB-containing materials currently in-use and in storage and limits the period of time PCB materials can be stored before being eliminated. Other aspects of the regulation govern the labelling and reporting of stored PCB materials and equipment as well as improved practices for the management of PCBs that remain in use (i.e., those with PCB concentrations less than 50 mg/kg) until their eventual elimination.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Appendix A

Designated Substances and Hazardous Building Materials Background Information and Regulatory Framework

Ozone-Depleting Substances

Ozone-depleting substances (ODSs) are chemical agents known as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) used in various refrigeration equipment including air-conditioning, heat pump, refrigeration or freezer units. They have also been used in solvents, as aerosol additives in the production of foam insulation and in fire extinguishing equipment. The use of refrigerants (including those that are ODSs or contain ODSs) is regulated by Ontario Regulation 463/10, *Ozone Depleting Substances and Other Halocarbons* (O. Reg. 463/10), under the EPA. The regulation imposes restrictions on the purchasing of refrigerants and on the servicing, dismantling, disposing of or decommissioning of equipment containing refrigerants or halon fire extinguishing agents.

On federal land, aboriginal land and federal works, buildings and undertakings, *Federal Halocarbon Regulation 2003* (SOR/2003-289) applies. All other buildings and uses of refrigerants and other agents are under the *Ozone-Depleting Substances Regulations 1998* (SOR/99-7), under CEPA. The regulations prohibit the release of halocarbons contained in refrigeration systems, air conditioning systems, fire extinguishers (except to fight a fire that is not a fire caused for training purposes) or containers or equipment used in the re-use, recycling, reclamation or storage of a halocarbon.

The regulations also impose restrictions on the servicing and dismantling, disposing of or decommissioning of any system containing halocarbons and requires the recovery of halocarbons into an appropriate container by a certified individual. The regulation also details an owner's record-keeping obligations.

Mould

Mould can be found everywhere in the outside environment, on plants, in soil and on dead and decaying matter (i.e., dead leaves). Mould requires two main conditions in order to grow - a source of food (a substrate typically comprised of cellulose) and water. Sources of food for mould are plentiful in outdoor and indoor environments; however it is the presence of water in an indoor environment that will determine mould growth. The source of water can be a result of a water pipe leak or even excess condensation. Thus, the key to controlling mould indoors is to control the presence of water.

At present, there are no specific laws or regulations governing acceptable levels of mould in buildings. The lack of specific regulatory standards is due in part to an inability to establish exposure-response relationships. Variation in individual susceptibility, limitations in sampling and analytical techniques, and the vast number of fungal agents and their products make it difficult to establish safe levels of exposure for all individuals. With a lack of defined exposure criteria, current Health Canada and other agency guidelines on the assessment and control of mould contamination in public buildings are largely based on prudent avoidance (i.e., remove any indoor growth or amplification site of mould, regardless of the concentration of moulds or their products in the indoor environment).



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Appendix A

Designated Substances and Hazardous Building Materials Background Information and Regulatory Framework

Although there are currently no regulations in Canada pertaining specifically to mould in buildings, based on an Ontario MOL alert, employers are required by Section 25(2)(h) of the Occupational Health and Safety Act to take every precaution reasonable in the circumstances for the protection of workers.

The OHS Act places a responsibility on constructors (Section 23), employers (Section 25), and supervisors (Section 27) to ensure the health and safety of workers. This includes protecting workers from mould in workplace buildings. Various sections of the Industrial, Construction, Mining or Health Care regulations may also apply to maintenance and remediation activities.

The Ontario MOL has published an Alert (MOL, 2000) indicating that sustained and/or extensive growth of visible mould on interior surfaces of a building is unacceptable and stating that mould growth on the interior surfaces of buildings is a risk factor for health problems.

Several guidelines and other resources describe procedures for the investigation and remediation of mould. The following documents indicate that mould observed in occupied building should be remediated in accordance with these procedures:

- *Environmental Abatement Council of Ontario's (EACO) Mould Abatement Guidelines*, 2010 – Edition 2;
- *Mould Guidelines for The Canadian Construction Industry*, Canadian Construction Association – 82, 2004;
- *Guidelines on Assessment and Remediation of Fungi in Indoor Environment*, New York City Department of Health and Mental Hygiene, November 2008;
- *Bioaerosols: Assessment and Control*, American Conference of Governmental Industrial Hygienists (ACGIH), 1999;
- *Fungal Contamination in Public Buildings: Health Effects and Investigation Methods*, Federal-Provincial Committee on Environmental and Occupational Health, 2004;
- *Field Guide for the Determination of Biological Contaminants in Environmental Samples*, American Industrial Hygiene Association (AIHA), 1996; and,
- *Clean-Up Procedures for Mould in Houses*, Canada Mortgage and Housing Corporation (CMHC), 2004.

Urea Formaldehyde Foam Insulation

Urea-formaldehyde foam insulation (UFFI) was developed in Europe in the 1950s as an improved means of insulating difficult-to-reach cavities in building 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.

During the 1970s, when concerns about energy efficiency led to efforts to improve home insulation in Canada, UFFI became an important insulation product for existing houses. Most installations occurred between 1977 and its ban in Canada in 1980.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Appendix A

Designated Substances and Hazardous Building Materials Background Information and Regulatory Framework

In the insulating process, a slight excess of formaldehyde was often added to ensure complete "curing" with the urea to produce the urea-formaldehyde foam. 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. 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.

While small amounts of formaldehyde are harmless, it is an irritating and toxic gas in significant concentrations. Symptoms of overexposure to formaldehyde include irritation to eyes, nose and throat; persistent cough and respiratory distress; skin irritation; nausea; headache; and dizziness.

Health Canada has determined that 0.1 parts per million (ppm) is a safe level of formaldehyde in the home. Sensitivity to this level may vary based on individual age and health.

Tests show that UFFI is not a source of over-exposure to formaldehyde after the initial curing and release of excess gas. As it was last installed in 1980, it would certainly not be causing excess indoor formaldehyde today. Buildings with UFFI show no higher formaldehyde levels than those without it. However, if UFFI comes in contact with water or moisture, it could begin to break down. Wet or deteriorating UFFI should be removed by a specialist and the source of the moisture problem should be repaired.

There are currently no regulations in Canada pertaining specifically to UFFI in buildings. However, the Occupational Health and Safety Act places a responsibility on constructors (Section 23), employers (Section 25), and supervisors (Section 27) to ensure the health and safety of workers.


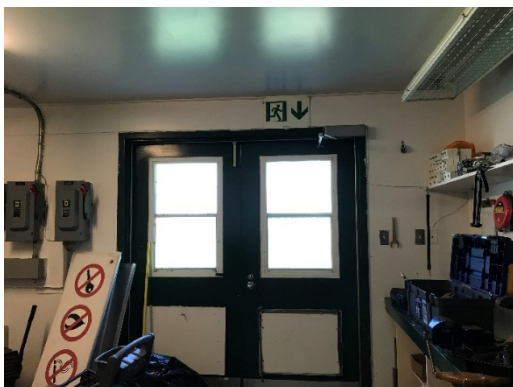






**DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT –
NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL**



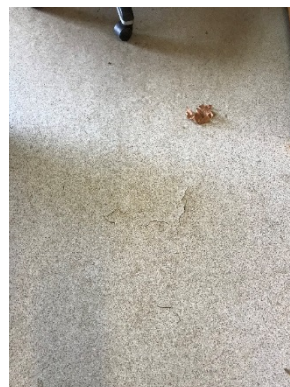
Appendix B
Site Photographs

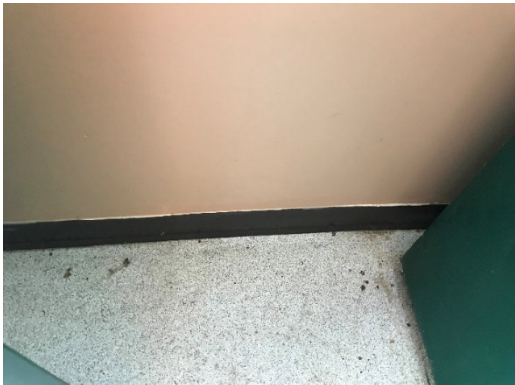


**APPENDIX B
SITE PHOTOGRAPHS**






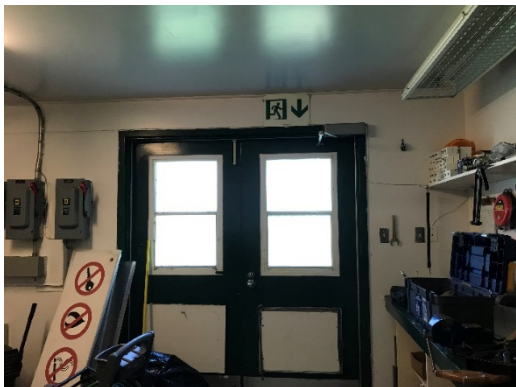


LOCATION	DESCRIPTION	PHOTO
Control Building, Corridor	Asbestos-containing interior window (on door) glazing compound – black on the corridor door Sample Ref:BS-08A 0.95% chrysotile	
Control Building, Mechanical Room 2	Presumed asbestos-containing fire rated doors, not expected to be impacted by renovations	
Control Building, Women's Washroom	Presumed asbestos-containing ceramic tile grout and mortar/adhesive, not expected to be impacted by renovations	


LOCATION	DESCRIPTION	PHOTO
Control Building, Exterior	Non-asbestos-containing exterior brick mortar – grey Sample BS-01A	
Control Building, Exterior	Non-asbestos-containing exterior window caulking – grey Sample BS-02B	
Control Building, Exterior	Non-asbestos-containing exterior door caulking – grey Sample BS-03C	

LOCATION	DESCRIPTION	PHOTO
Control Building, Exterior	Non-asbestos-containing exterior wall/ceiling caulking – grey Sample BS-04A	
Control Building, Office	Non-asbestos-containing drywall joint-fill compound Sample BS-05A	
Control Building, Office	Non-asbestos-containing vinyl sheet flooring – beige grey with specks and associated paper backing Sample BS-06A	

LOCATION	DESCRIPTION	PHOTO
Control Building, Corridor	Non-asbestos-containing cove base mastic Sample BS-07B	
Control Building, Washroom	Non-asbestos-containing floor drain caulking – clear Sample BS-09A	
Control Building, Mechanical Room 1	Non-asbestos-containing floor leveling compound and fibreglass pipe insulation Samples BS-10A	

LOCATION	DESCRIPTION	PHOTO
Control Building, Corridor	Non-asbestos-containing interior door caulking – white. Sample Ref: BS-11A	
Exterior	Non-asbestos-containing walkway mortar Sample BS-12A	
Exterior	Non-asbestos-containing retaining wall mortar Sample BS-13A	

LOCATION	DESCRIPTION	PHOTO
Control Building, Mechanical Room 2	Lead-based dark green coloured paint observed on the door frames Sample PS-03 25,000 ppm	
Control Building, Exterior	Lead-based dark green coloured paint observed on the exterior soffit, window frames and door frames on the Control Building Sample PS-01 26,000 ppm	
Control Building, Mechanical Room 1	Lead-based grey coloured paint observed on the floor Sample PS-04 17,000 ppm	

LOCATION	DESCRIPTION	PHOTO
Control Building, Mechanical Room 1	Identified mould on the pipe insulation Sample MS-01	

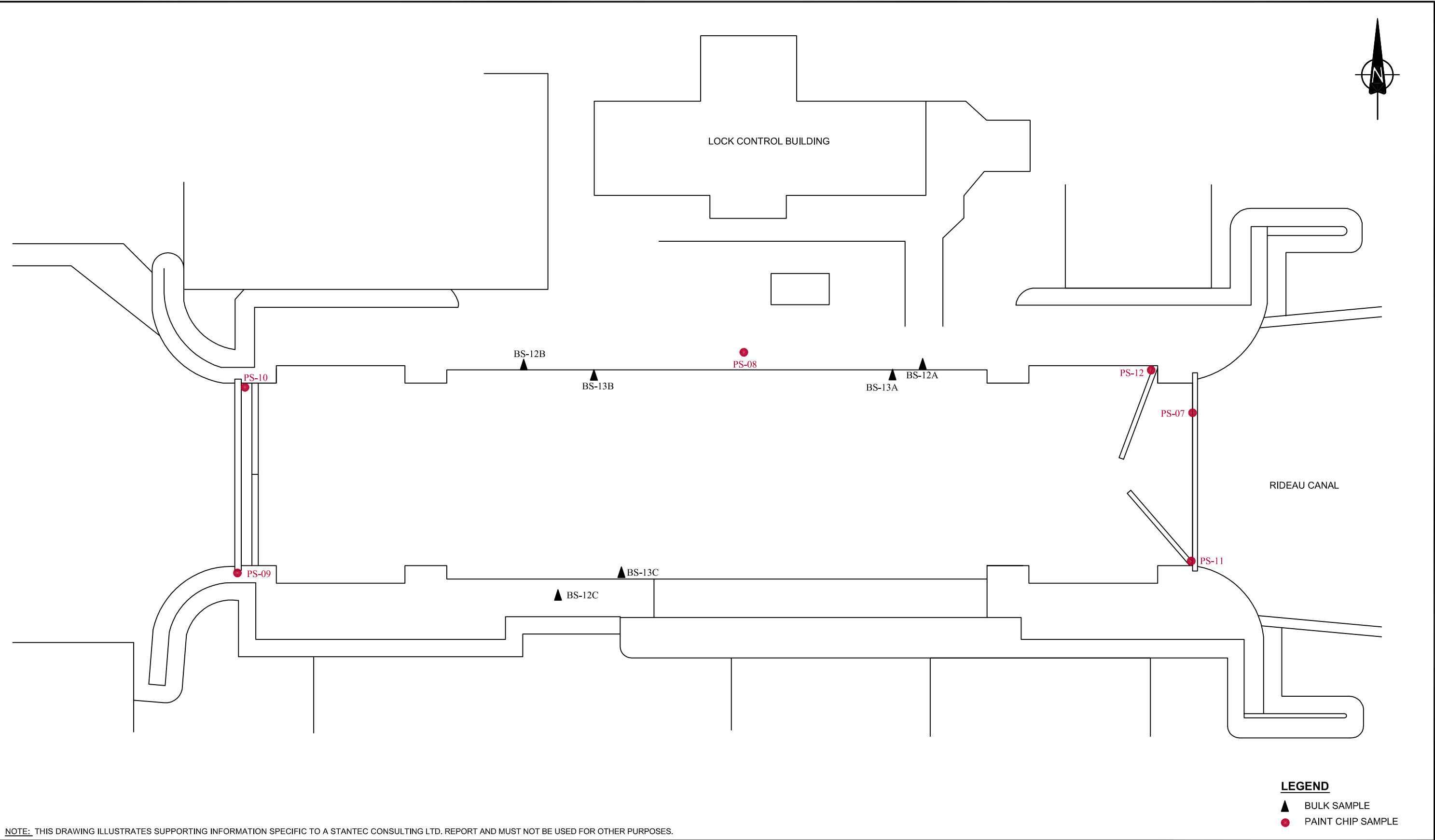
**DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT –
NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL**

Appendix C
Floor Plans

APPENDIX C
FLOOR PLANS



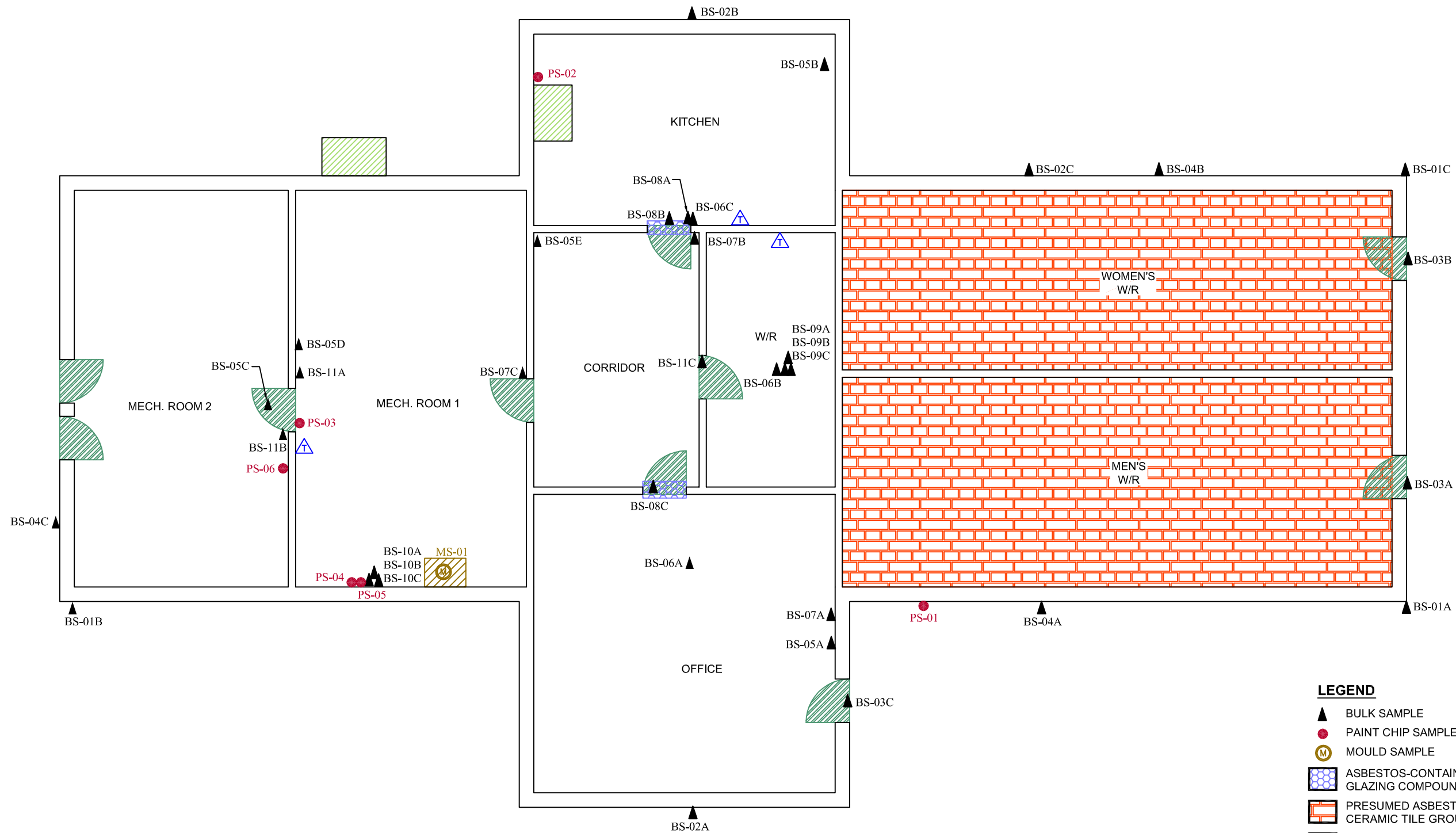
\\server01\Production\Stantec_CN\2018\May\SL2018050136\Production\122150657_NEWBORO LOCK 36_180519_1.dwg PRINTED: May 19, 2018



NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

Reference:	Project No.:	122150657	Client:	PUBLIC SERVICES AND PROCUREMENT CANADA	SITE PLAN	Dwg. No.:	1	
	Scale:	N.T.S.						
	Date:	18/05/19						
	Dwn. By:	CD <small>DM</small> <small>SL2018050136</small>	Site Address	NEWBORO LOCK 36 10 BLOCKHOUSE LANE NEWBORO, ONTARIO				
	App'd By:	LF						

\\server01\Production\Stantec_CN\2018\May\SL2018050165\Production\122150657_NEWBORO LOCK 36_180525_2.dwg PRINTED: May 25, 2018



LEGEND

- ▲ BULK SAMPLE
- PAINT CHIP SAMPLE
- Ⓜ MOULD SAMPLE
- ▨ ASBESTOS-CONTAINING GLAZING COMPOUND
- ▨ PRESUMED ASBESTOS-CONTAINING CERAMIC TILE GROUT AND MORTAR/ADHESIVE
- ▨ PRESUMED ASBESTOS-CONTAINING FIRE RATED DOORS
- ▨ SUSPECT MOULD
- ▨ EQUIPMENT SUSPECTED TO CONTAIN OZONE DEPLETING SUBSTANCES
- ⚠ SUSPECT MERCURY-CONTAINING THERMOSTAT

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

Reference:	Project No.:	122150657	Client:	PUBLIC SERVICES AND PROCUREMENT CANADA	FLOOR PLAN	Dwg. No.:	2	
	Scale:	N.T.S.						
	Date:	18/05/25	Site Address	NEWBORO LOCK 36 10 BLOCKHOUSE LANE NEWBORO, ONTARIO				
	Dwn. By:	CD_DM SL2018050165						
	App'd By:	LF						

**DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT –
NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL**

Appendix D
Summary of Results of Analysis of Bulk Samples for Asbestos

APPENDIX D
SUMMARY OF RESULTS OF ANALYSIS OF
BULK SAMPLES FOR ASBESTOS



Summary of Bulk Sample Analysis for Asbestos Type and Content

Sample Number	Sampling Location	Description of Sampled Material	Asbestos Type and Content	Analysis
BS-01A	Exterior, Southeast Wall	Exterior Brick Mortar - Grey	None Detected	PLM
BS-01B	Exterior, Southwest Wall	Exterior Brick Mortar - Grey	None Detected	PLM
BS-01C	Exterior, Northeast Wall	Exterior Brick Mortar - Grey	None Detected	PLM
BS-02A	Exterior, Office	Exterior Window Caulking - Grey	None Detected	PLM
BS-02B	Exterior, Kitchen	Exterior Window Caulking - Grey	None Detected	PLM
BS-02C	Exterior, Women's Washroom	Exterior Window Caulking - Grey	None Detected	PLM
BS-03A	Exterior, Men's Washroom	Exterior Door Caulking - Grey	None Detected	PLM
BS-03B	Exterior, Women's Washroom	Exterior Door Caulking - Grey	<0.25% chrysotile	PLM
BS-03C	Exterior, Office	Exterior Door Caulking - Grey	None Detected	PLM
BS-04A	Exterior, South Wall	Exterior Wall Caulking - Grey	None Detected	PLM
BS-04B	Exterior, Northeast Wall	Exterior Wall Caulking - Grey	<0.25% chrysotile	PLM
BS-04C	Exterior, West Wall	Exterior Wall Caulking - Grey	<0.25% chrysotile	PLM
BS-05A	Office Wall	Drywall Joint-Fill Compound	None Detected	PLM
BS-05B	Kitchen Wall	Drywall Joint-Fill Compound	None Detected	PLM
BS-05C	Mechanical Room 2 Ceiling	Drywall Joint-Fill Compound	None Detected	PLM
BS-05D	Mechanical Room 1 Ceiling	Drywall Joint-Fill Compound	None Detected	PLM
BS-05E	Corridor Wall	Drywall Joint-Fill Compound	None Detected	PLM
BS-06A	Office	Vinyl Sheet Flooring - Beige Grey with Specks and Associated Paper Backing	None Detected	PLM

Summary of Bulk Sample Analysis for Asbestos Type and Content

Sample Number	Sampling Location	Description of Sampled Material	Asbestos Type and Content	Analysis
BS-06B	Washroom Inside Control Room	Vinyl Sheet Flooring - Beige Grey with Specks and Associated Paper Backing	None Detected	PLM
BS-06C	Kitchen	Vinyl Sheet Flooring - Beige Grey with Specks and Associated Paper Backing	None Detected	PLM
BS-07A	Office	Cove Base Mastic	None Detected	PLM
BS-07B	Corridor	Cove Base Mastic	None Detected	PLM
BS-07C	Mechanical Room 1	Cove Base Mastic	None Detected	PLM
BS-08A	Kitchen	Window (on Interior Door) Glazing Compound - Black	0.95% chrysotile	PLM
BS-08B	Kitchen	Window (on Interior Door) Glazing Compound - Black	Positive Stop (Not Analyzed)	PLM
BS-08C	Corridor	Window (on Interior Door) Glazing Compound - Black	Positive Stop (Not Analyzed)	PLM
BS-09A	Washroom inside Control Room	Floor Drain Caulking - Clear	None Detected	PLM
BS-09B	Washroom inside Control Room	Floor Drain Caulking - Clear	None Detected	PLM
BS-09C	Washroom inside Control Room	Floor Drain Caulking - Clear	None Detected	PLM
BS-10A-GREY LEVELING COMPOUND	Mechanical Room 1	Floor Leveling Compound	None Detected	PLM
BS-10A-WHITE LEVELING COMPOUND	Mechanical Room 1	Floor Leveling Compound	None Detected	PLM
BS-10B-GREY LEVELING COMPOUND	Mechanical Room 1	Floor Leveling Compound	None Detected	PLM
BS-10B-WHITE LEVELING COMPOUND	Mechanical Room 1	Floor Leveling Compound	None Detected	PLM

Summary of Bulk Sample Analysis for Asbestos Type and Content

Sample Number	Sampling Location	Description of Sampled Material	Asbestos Type and Content	Analysis
BS-10C-GREY LEVELING COMPOUND	Mechanical Room 1	Floor Leveling Compound	None Detected	PLM
BS-10C-WHITE LEVELING COMPOUND	Mechanical Room 1	Floor Leveling Compound	None Detected	PLM
BS-11A	Mechanical Room 1	Interior Door Caulking - White	None Detected	PLM
BS-11B	Mechanical Room 2	Interior Door Caulking - White	None Detected	PLM
BS-11C	Washroom Inside Control Room	Interior Door Caulking - White	None Detected	PLM
BS-12A	Exterior, Northeast Walkway	Walkway Mortar	None Detected	PLM
BS-12B	Exterior, Northwest Walkway	Walkway Mortar	None Detected	PLM
BS-12C	Exterior, South Walkway	Walkway Mortar	None Detected	PLM
BS-13A	Exterior, Northeast Section of the Wall	Retaining Wall Mortar	None Detected	PLM
BS-13B	Exterior, Northwest Section of the Wall	Retaining Wall Mortar	None Detected	PLM
BS-13C	Exterior, South Section of the Wall	Retaining Wall Mortar	None Detected	PLM

**DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT –
NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL**

Appendix E
Summary of Occurrences of Asbestos-Containing Materials

APPENDIX E
SUMMARY OF OCCURRENCES OF
ASBESTOS-CONTAINING MATERIALS



Summary of Occurrences of Asbestos-Containing Materials

Level	Room	Specific Location	ACM Location	ACM Type	Estimated Quantity	Sample Number	Original Sample?	Asbestos Content	Friable?	Access. Visible?	Access.	ACM Condition	Comments/ Notes
1	Control Building, Corridor	Door	Wall	Fire Rated Door	1 Door	NS	No	PACM	No	Yes	A	good (PACM)	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.
1	Control Building, Corridor	Window on Door	Wall	Interior Window (on Door) Glazing Compound - Black	1 m	Ref:BS-08A	No	0.95% chrysotile	No	Yes	A	good	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.
1	Control Building, Kitchen	Door	Wall	Fire Rated Door	1 Door	NS	No	PACM	No	Yes	A	good (PACM)	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.
1	Control Building, Kitchen	Window on Door	Wall	Interior Window (on Door) Glazing Compound - Black	1 m	BS-08A	Yes	0.95% chrysotile	No	Yes	A	good	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.
1	Control Building, Mechanical Room 1	Door	Wall	Fire Rated Door	1 Door	NS	No	PACM	No	Yes	A	good (PACM)	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.
1	Control Building, Mechanical Room 2	Door	Wall	Fire Rated Door	3 Doors	NS	No	PACM	No	Yes	A	good (PACM)	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.

Accessibility Classification

- A - Areas of the building within reach (from floor level) of all building users
- B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
- C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
- 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 asbestos

Visibility

- Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
- No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

* Based on a non-intrusive inspection of visible surfaces within the room space.

Notes:
 ACM - asbestos-containing material
 PACM - presumed asbestos-containing material
 Access. - accessibility
 nq - not quantified
 na - not applicable
 ns - not sampled
 ref - reference sample
 F - friable
 NF - non friable
 RCA - recommend corrective action
 BS - bulk sample

Summary of Occurrences of Asbestos-Containing Materials

Level	Room	Specific Location	ACM Location	ACM Type	Estimated Quantity	Sample Number	Original Sample?	Asbestos Content	Friable? Visible?	Access.	ACM Condition	Comments/ Notes	
1	Control Building, Men's Washroom	Door	Wall	Fire Rated Door	1 Door	NS	No	PACM	No	Yes	A	good (PACM)	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.
1	Control Building, Men's Washroom	Walls and Floor	Walls and Floor	Ceramic Tile Grout and Mortar/Adhesive	75 sq. m	NS	No	PACM	No	Yes	A	good (PACM)	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.
1	Control Building, Office	Door	Wall	Fire Rated Door	1 Door	NS	No	PACM	No	Yes	A	good (PACM)	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.
1	Control Building, Women's Washroom	Door	Wall	Fire Rated Door	1 Door	NS	No	PACM	No	Yes	A	good (PACM)	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.
1	Control Building, Women's Washroom	Walls and Floor	Walls and Floor	Ceramic Tile Grout and Mortar/Adhesive	75 sq. m	NS	No	PACM	No	Yes	A	good (PACM)	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.
Roof	Control Building, Roof	Roof	Roof	Roof Caulking	NQ	NS	No	PACM	No	Yes	C	good (PACM)	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.

Accessibility Classification

- A - Areas of the building within reach (from floor level) of all building users
- B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
- C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
- 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 asbestos

Visibility

- Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
- No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

* Based on a non-intrusive inspection of visible surfaces within the room space.

Notes:
 ACM - asbestos-containing material
 PACM - presumed asbestos-containing material
 Access. - accessibility
 nq - not quantified
 na - not applicable
 ns - not sampled
 ref - reference sample
 F - friable
 NF - non friable
 RCA - recommend corrective action
 BS - bulk sample

Summary of Occurrences of Asbestos-Containing Materials

Level	Room	Specific Location	ACM Location	ACM Type	Estimated Quantity	Sample Number	Original Sample?	Asbestos Content	Friable?	Access. Visible?	ACM Condition	Comments/ Notes	
Roof	Control Building, Roof	Roof	Roof	Roofing Materials	NQ	NS	No	PACM	No	Yes	C	good (PACM)	NOT EXPECTED TO BE IMPACTED BY REHABILITATION PROJECT.

Accessibility Classification

- A - Areas of the building within reach (from floor level) of all building users
- B - Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder
- C - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos
- 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 asbestos

Visibility

- Yes - Suspect material is visible without opening hatches or lifting ceiling tiles
- No - Suspect material can only be viewed if access hatches are opened or ceiling tiles lifted.

* Based on a non-intrusive inspection of visible surfaces within the room space.

Notes:
 ACM - asbestos-containing material
 PACM - presumed asbestos-containing material
 Access. - accessibility
 nq - not quantified
 na - not applicable
 ns - not sampled
 ref - reference sample
 F - friable
 NF - non friable
 RCA - recommend corrective action
 BS - bulk sample

**DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT –
NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL**

Appendix F
Laboratory Analytical Report – Asbestos: Polarized Light Microscopy

APPENDIX F
LABORATORY ANALYTICAL REPORT –
ASBESTOS: POLARIZED LIGHT
MICROSCOPY





EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551805393
Customer ID: 55JACQ30J
Customer PO: 122150657
Project ID:

Attn: Urvashi Vyas
Stantec Consulting Ltd.
300-675 Cochrane Drive, West Tower
Markham, ON L3R 0B8

Phone: (905) 474-7700
Fax: (905) 479-9326
Collected: 5/ 8/2018
Received: 5/09/2018
Analyzed: 5/16/2018

Proj: Newboro Lock 36 - 122150657

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: BS-01A **Lab Sample ID:** 551805393-0001

Sample Description: EXTERIOR BRICK MORTAR - GREY - EXTERIOR, SOUTHEAST WALL

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	Gray	0%	100%	None Detected	

Client Sample ID: BS-01B **Lab Sample ID:** 551805393-0002

Sample Description: EXTERIOR BRICK MORTAR - GREY - EXTERIOR, SOUTHWEST WALL

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	Gray	0%	100%	None Detected	

Client Sample ID: BS-01C **Lab Sample ID:** 551805393-0003

Sample Description: EXTERIOR BRICK MORTAR - GREY - EXTERIOR, NORTHEAST WALL

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	Gray	0%	100%	None Detected	

Client Sample ID: BS-02A **Lab Sample ID:** 551805393-0004

Sample Description: EXTERIOR WINDOW CAULKING - GREY - EXTERIOR, OFFICE

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Green	0.0%	100%	None Detected	

Client Sample ID: BS-02B **Lab Sample ID:** 551805393-0005

Sample Description: EXTERIOR WINDOW CAULKING - GREY - EXTERIOR, KITCHEN

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Green	0.0%	100%	None Detected	

Client Sample ID: BS-02C **Lab Sample ID:** 551805393-0006

Sample Description: EXTERIOR WINDOW CAULKING - GREY - EXTERIOR WOMEN'S WASHROOM

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Green	0.0%	100%	None Detected	

Client Sample ID: BS-03A **Lab Sample ID:** 551805393-0007

Sample Description: EXTERIOR DOOR CAULKING - GREY - EXTERIOR MEN'S WASHROOM

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Green	0.0%	100%	None Detected	



EMSL Canada Inc.

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<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551805393
Customer ID: 55JACQ30J
Customer PO: 122150657
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: BS-03B **Lab Sample ID:** 551805393-0008

Sample Description: EXTERIOR DOOR CAULKING - GREY - EXTERIOR WOMEN'S WASHROOM

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Green	0.0%	100%	<0.25% Chrysotile	

Client Sample ID: BS-03C **Lab Sample ID:** 551805393-0009

Sample Description: EXTERIOR DOOR CAULKING - GREY - EXTERIOR OFFICE

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Green	0.0%	100%	None Detected	

Client Sample ID: BS-04A **Lab Sample ID:** 551805393-0010

Sample Description: EXTERIOR WALL CAULKING - GREY - EXTERIOR SOUTH WALL

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Green	0.0%	100%	None Detected	

Client Sample ID: BS-04B **Lab Sample ID:** 551805393-0011

Sample Description: EXTERIOR WALL CAULKING - GREY - EXTERIOR NORTHWEST WALL

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Green	0.0%	100%	<0.25% Chrysotile	

Client Sample ID: BS-04C **Lab Sample ID:** 551805393-0012

Sample Description: EXTERIOR WALL CAULKING - GREY - EXTERIOR WEST WALL

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Green	0.0%	100%	<0.25% Chrysotile	

Client Sample ID: BS-05A **Lab Sample ID:** 551805393-0013

Sample Description: DRYWALL JOINT-FILL COMPOUND - OFFICE WALL

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	White	0%	100%	None Detected	

Client Sample ID: BS-05B **Lab Sample ID:** 551805393-0014

Sample Description: DRYWALL JOINT-FILL COMPOUND - KITCHEN WALL

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	White	0%	100%	None Detected	

Client Sample ID: BS-05C **Lab Sample ID:** 551805393-0015

Sample Description: DRYWALL JOINT-FILL COMPOUND - MECHANICAL ROOM 2 CEILING

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	White	0%	100%	None Detected	



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EMSL Canada Order 551805393
Customer ID: 55JACQ30J
Customer PO: 122150657
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: BS-05D **Lab Sample ID:** 551805393-0016
Sample Description: DRYWALL JOINT-FILL COMPOUND - MECHANICAL ROOM 1 CEILING

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	White	0%	100%	None Detected	

Client Sample ID: BS-05E **Lab Sample ID:** 551805393-0017
Sample Description: DRYWALL JOINT-FILL COMPOUND - CORRIDOR WALL

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	White	0%	100%	None Detected	

Client Sample ID: BS-06A **Lab Sample ID:** 551805393-0018
Sample Description: VINYL SHEET FLOORING - BEIGE GREY WITH SPECKS AND ASSOCIATED PAPER
BACKING - OFFICE

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	White	0.0%	100%	None Detected	

Client Sample ID: BS-06B **Lab Sample ID:** 551805393-0019
Sample Description: VINYL SHEET FLOORING - BEIGE GREY WITH SPECKS AND ASSOCIATED PAPER
BACKING - WASHROOM INSIDE CONTROL ROOM

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	White	0.0%	100%	None Detected	

Client Sample ID: BS-06C **Lab Sample ID:** 551805393-0020
Sample Description: VINYL SHEET FLOORING - BEIGE GREY WITH SPECKS AND ASSOCIATED PAPER
BACKING - KITCHEN

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	White	0.0%	100%	None Detected	

Client Sample ID: BS-07A **Lab Sample ID:** 551805393-0021
Sample Description: COVE BASE MASTIC - OFFICE

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Yellow	0.0%	100%	None Detected	

Client Sample ID: BS-07B **Lab Sample ID:** 551805393-0022
Sample Description: COVE BASE MASTIC - CORRIDOR

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Yellow	0.0%	100%	None Detected	

Client Sample ID: BS-07C **Lab Sample ID:** 551805393-0023
Sample Description: COVE BASE MASTIC - MECHANICAL ROOM 1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Yellow	0.0%	100%	None Detected	



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EMSL Canada Order 551805393
Customer ID: 55JACQ30J
Customer PO: 122150657
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: BS-08A **Lab Sample ID:** 551805393-0024

Sample Description: WINDOW (ON INTERIOR DOOR) GLAZING COMPOUND - BLACK - KITCHEN

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Black	0.0%	99.0%	0.95% Chrysotile	

Client Sample ID: BS-08B **Lab Sample ID:** 551805393-0025

Sample Description: WINDOW (ON INTERIOR DOOR) GLAZING COMPOUND - BLACK - KITCHEN

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018				Positive Stop (Not Analyzed)	

Client Sample ID: BS-08C **Lab Sample ID:** 551805393-0026

Sample Description: WINDOW (ON INTERIOR DOOR) GLAZING COMPOUND - BLACK - CORRIDOR

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018				Positive Stop (Not Analyzed)	

Client Sample ID: BS-09A **Lab Sample ID:** 551805393-0027

Sample Description: FLOOR DRAIN CAULKING - CLEAR - WASHROOM INSIDE CONTROL ROOM

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Clear	0.0%	100%	None Detected	

Client Sample ID: BS-09B **Lab Sample ID:** 551805393-0028

Sample Description: FLOOR DRAIN CAULKING - CLEAR - WASHROOM INSIDE CONTROL ROOM

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Clear	0.0%	100%	None Detected	

Client Sample ID: BS-09C **Lab Sample ID:** 551805393-0029

Sample Description: FLOOR DRAIN CAULKING - CLEAR - WASHROOM INSIDE CONTROL ROOM

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	Clear	0.0%	100%	None Detected	

Client Sample ID: BS-10A-Grey Leveling Compound **Lab Sample ID:** 551805393-0030

Sample Description: FLOOR LEVELING COMPOUND - MECHANICAL ROOM 1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	Gray	0%	100%	None Detected	

Client Sample ID: BS-10A-White Leveling Compound **Lab Sample ID:** 551805393-0030A

Sample Description: FLOOR LEVELING COMPOUND - MECHANICAL ROOM 1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	White	0%	100%	None Detected	



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EMSL Canada Order 551805393
Customer ID: 55JACQ30J
Customer PO: 122150657
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: BS-10B-Grey Leveling Compound **Lab Sample ID:** 551805393-0031
Sample Description: FLOOR LEVELING COMPOUND - MECHANICAL ROOM 1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	Gray	0%	100%	None Detected	

Client Sample ID: BS-10B-White Leveling Compound **Lab Sample ID:** 551805393-0031A
Sample Description: FLOOR LEVELING COMPOUND - MECHANICAL ROOM 1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	White	0%	100%	None Detected	

Client Sample ID: BS-10C-Gray Leveling Compound **Lab Sample ID:** 551805393-0032
Sample Description: FLOOR LEVELING COMPOUND - MECHANICAL ROOM 1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	Gray	0%	100%	None Detected	

Client Sample ID: BS-10C-White Leveling Compound **Lab Sample ID:** 551805393-0032A
Sample Description: FLOOR LEVELING COMPOUND - MECHANICAL ROOM 1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	White	0%	100%	None Detected	

Client Sample ID: BS-11A **Lab Sample ID:** 551805393-0033
Sample Description: INTERIOR DOOR CAULKING - WHITE - MECHANICAL ROOM 1

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	White	0.0%	100%	None Detected	

Client Sample ID: BS-11B **Lab Sample ID:** 551805393-0034
Sample Description: INTERIOR DOOR CAULKING - WHITE - MECHANICAL ROOM 2

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	White	0.0%	100%	None Detected	

Client Sample ID: BS-11C **Lab Sample ID:** 551805393-0035
Sample Description: INTERIOR DOOR CAULKING - WHITE - WASHROOM INSIDE CONTROL ROOM

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	5/16/2018	White	0.0%	100%	None Detected	

Client Sample ID: BS-12A **Lab Sample ID:** 551805393-0036
Sample Description: WALKWAY MORTAR - EXTERIOR NORTHEAST WALKWAY

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	Gray	0%	100%	None Detected	



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EMSL Canada Order 551805393
Customer ID: 55JACQ30J
Customer PO: 122150657
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: BS-12B **Lab Sample ID:** 551805393-0037
Sample Description: WALKWAY MORTAR - EXTERIOR NORTHWEST WALKWAY

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	Gray	0%	100%	None Detected	

Client Sample ID: BS-12C **Lab Sample ID:** 551805393-0038
Sample Description: WALKWAY MORTAR - EXTERIOR SOUTH WALKWAY

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	Gray	0%	100%	None Detected	

Client Sample ID: BS-13A **Lab Sample ID:** 551805393-0039
Sample Description: RETAINING WALL MORTAR - EXTERIOR NORTHEAST SECTION OF THE WALL

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	Gray/Black	0%	100%	None Detected	

Client Sample ID: BS-13B **Lab Sample ID:** 551805393-0040
Sample Description: RETAINING WALL MORTAR - EXTERIOR NORTHWEST SECTION OF THE WALL

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	Gray/Black	0%	100%	None Detected	

Client Sample ID: BS-13C **Lab Sample ID:** 551805393-0041
Sample Description: RETAINING WALL MORTAR - EXTERIOR SOUTH SECTION OF THE WALL

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	5/16/2018	Gray/Black	0%	100%	None Detected	

Analyst(s):

Caroline Allen PLM Grav. Reduction (15)
Ioana Taina PLM (6)
PLM Grav. Reduction (7)
Michelle Lung PLM (14)

Reviewed and approved by:

Matthew Davis or other approved signatory
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

(Initial report from: 05/16/2018 17:47:31)

**DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT –
NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL**

Appendix G
Summary of Results of Analysis of Paint Chip Samples for Lead Content

APPENDIX G
SUMMARY OF RESULTS OF ANALYSIS OF
PAINT CHIP SAMPLES FOR LEAD
CONTENT



Summary of Results of Analysis of Paint Samples for Lead Content

Sample Numbe	Sampling Location	Description	Lead Content (ppm)
PS-01	Exterior, Soffit outside of the Office	Dark Green Coloured Paint	26,000
PS-02	Kitchen, Wall	Beige Coloured Paint	<88
PS-03	Mechanical Room 1, Door Frame	Dark Green Coloured Paint	25,000
PS-04	Mechanical Room 1, Floor	Grey Coloured Paint	17,000
PS-05	Mechanical Room 1, Wall	Light Blue Coloured Paint	<90
PS-06	Mechanical Room 2, Wall	White Coloured Paint	<88
PS-07	Exterior, Guardrail on East Lock Walkway	Black Coloured Paint	740
PS-08	Exterior, Grates on North Side of the Walkway	Grey Coloured Paint	4,800
PS-09	Exterior, West Lock Walkway	Grey Coloured Paint	<88
PS-10	Exterior, West Lock Walkway	Black Coloured Paint	<84
PS-11	Exterior, East Lock Walkway	White Coloured Paint	<82
PS-12	Exterior, Grey on East Lock Gate	Grey Coloured Paint	2,000

**DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT –
NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL**

Appendix H
Laboratory Analytical Report – Lead: Paint Chip Analysis

APPENDIX H
LABORATORY ANALYTICAL REPORT –
LEAD: PAINT CHIP ANALYSIS



**EMSL Canada Inc.**

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EMSL Canada Or 551805353
CustomerID: 55JACQ30J
CustomerPO: 122150657
ProjectID:

Attn: **Urvashi Vyas**
Stantec Consulting Ltd.
300-675 Cochrane Drive, West Tower
Markham, ON L3R 0B8

Phone: (905) 474-7700
Fax: (905) 479-9326
Received: 05/09/18 12:41 PM
Collected: 5/8/2018

Project: **NEWBORO LOCK 36 // 122150657****Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)***

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>Lead Concentration</i>
PS-01 Site: EXTERIOR, SOFFIT OUTSIDE OF THE OFFICE - DARK GREEN COLOURED PAINT	551805353-0001	5/8/2018	5/11/2018	0.2256 g	26000 ppm
PS-02 Site: KITCHEN, WALL - BEIGE COLOURED PAINT	551805353-0002	5/8/2018	5/11/2018	0.2276 g	<88 ppm
PS-03 Site: MECHANICAL ROOM 1 - DOOR FRAME - DARK GREEN COLOURED PAINT	551805353-0003	5/8/2018	5/11/2018	0.2220 g	25000 ppm
PS-04 Site: MECHANICAL ROOM 1 - FLOOR - GREY COLOURED PAINT	551805353-0004	5/8/2018	5/11/2018	0.2331 g	17000 ppm
PS-05 Site: MECHANICAL ROOM 1 - WALL - LIGHT BLUE COLOURED PAINT	551805353-0005	5/8/2018	5/11/2018	0.2211 g	<90 ppm
PS-06 Site: MECHANICAL ROOM 2 - WALL - WHITE COLOURED PAINT	551805353-0006	5/8/2018	5/11/2018	0.2271 g	<88 ppm
PS-07 Site: EXTERIOR, GUARDRAIL ON EAST LOCK WALKWAY - BLACK COLOURED PAINT	551805353-0007	5/8/2018	5/11/2018	0.2467 g	740 ppm
PS-08 Site: EXTERIOR, GRATES ON NORTH SIDE OF WALKWAY - GREY COLOURED PAINT	551805353-0008	5/8/2018	5/11/2018	0.2410 g	4800 ppm
PS-09 Site: EXTERIOR, WEST LOCK WALKWAY - GREY COLOURED PAINT	551805353-0009	5/8/2018	5/11/2018	0.2277 g	<88 ppm
PS-10 Site: EXTERIOR, WEST LOCK WALKWAY - BLACK COLOURED PAINT	551805353-0010	5/8/2018	5/11/2018	0.2382 g	<84 ppm
PS-11 Site: EXTERIOR, EAST LOCK WALKWAY - WHITE COLOURED PAINT	551805353-0011	5/8/2018	5/11/2018	0.2453 g	<82 ppm
PS-12 Site: EXTERIOR, GREY ON EAST LOCK GATE - GREY COLOURED PAINT	551805353-0012	5/8/2018	5/11/2018	0.2349 g	2000 ppm

Rowena Fanto, Lead Supervisor
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 05/16/2018 09:14:34

**DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT –
NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL**

Appendix I
Laboratory Analytical Report – Mould Tape-Lift Sample

**APPENDIX I
LABORATORY ANALYTICAL REPORT –
MOULD TAPE-LIFT SAMPLE**





RESULTS OF LABORATORY ANALYSES:

JOB NO. 29907.00

To:	Urvashi Vyas	Date of report:	2018/05/11
Company:	Stantec Consulting Ltd. - Markham, ON	Date of sampling:	2018/05/08
Client Project:	Newboro Lock 36 - 122150657	Analyst:	Yaima Arocha-Rosete
Client Address:	675 Cochrane Drive, Unit #300, Markham, ON L3R 0B8	Date Received:	2018/05/09

BULK / TAPELIFT / BIOTAPE SAMPLE NO.:	MS-01	-	-	-	-	-
Location:	Mechanical Room 1, Pipe Insulation					
Serial #:	101515					
Expiry date:	2020/07					
FUNGAL IDENTIFICATION: ^a	ELEMENTS:	MICROSCOPIC OBSERVATIONS ^b (RATING ^c):				
<i>Alternaria</i> (<i>Ulocladium</i>) NOS	mycelia spores	tr 1+				
<i>Aspergillus</i> / <i>Penicillium</i> NOS	mycelia spores	- tr				
<i>Cladosporium</i> NOS	mycelia spores	2+ 3+				
basidiospores NOS		tr				
OTHER OBSERVATIONS:						
background rating		3+				
FUNGAL GROWTH INDICATED?^d:		Y				

AIHA LAP, LLC LAB NO: 171117

Samples were received in satisfactory condition and tested in accordance with SOP 5.4.1.1.3. These results relate only to the samples tested.

^a **NOS** = not otherwise specified.

^b Mounted in lactofuchsin / lactic acid, or other medium as required, with 50-100 fields examined in bright field microscopy at 400x magnification.

^c - = not detected; tr = 10⁰ - 10¹ elements in total; 1+ = 10⁰ - 10¹ elements in each of ~25% fields; 2+ = 10¹ - 10² elements in each of ~50% fields; 3+ = 10² - 10³ elements in each of ~75% fields; 4+ => 75% fields obscured.

^d Possibility of fungal growth *in situ* based on microscopic observations; Y = yes; N = no; ? = ambiguous. For explanation please refer to the final page of this report.



RESULTS OF LABORATORY ANALYSES:

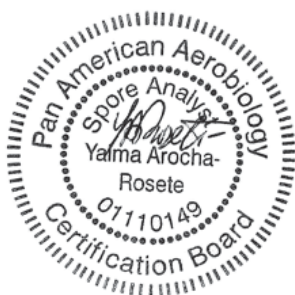
JOB NO. 29907.00

To:	Urvashi Vyas	Date of report:	2018/05/11
Company:	Stantec Consulting Ltd. - Markham, ON	Date of sampling:	2018/05/08
Client Project:	Newboro Lock 36 - 122150657	Analyst:	Yaima Arocha-Rosete
Client Address:	675 Cochrane Drive, Unit #300, Markham, ON L3R 0B8	Date Received:	2018/05/09

END OF REPORT

Examined By

Released By



Yaima Arocha-Rosete, PhD

Mike Saleh, MHSc

Analyst

Analyst





RESULTS OF LABORATORY ANALYSES:

JOB NO. 29907.00

To:	Urvashi Vyas	Date of report:	2018/05/11
Company:	Stantec Consulting Ltd. - Markham, ON	Date of sampling:	2018/05/08
Client Project:	Newboro Lock 36 - 122150657	Analyst:	Yaima Arocha-Rosete
Client Address:	675 Cochrane Drive, Unit #300, Markham, ON L3R 0B8	Date Received:	2018/05/09

Guidance on the interpretation of microscopic findings Samples of bulk materials as well as tape lift samples from potentially contaminated surfaces may be examined microscopically to assess the potential of these materials to be supporting fungal growth and serving as indoor fungal amplification sites. Guidelines on indoor microbial contamination proposed by Health Canada (HC. 1995. *Indoor air quality in office buildings: A technical guide*. Federal-Provincial Advisory Committee on Environmental and Occupational Health. Ottawa: Environmental Health Directorate 93-EHD-166 rev.) state unambiguously that indoor, active fungal growth sites are unacceptable regardless of the extent to which these amplifiers impact on the indoor airborne spore-load. Fungal spores are commonly borne on air currents and settle on flat surfaces as a matter of course. Thus, the observation of fungal spores alone is insufficient to characterize a specimen as a growth site. This judgment primarily requires the microscopic visualization of fungal filaments ("hyphae", or *en masse*, "mycelia"). Additionally, the identification of different kinds of fungi usually requires the observation of spores (e.g. conidia, ascospores, etc.) along with the organs responsible for their production (e.g. conidiophores, ascomata, etc.). However, the latter rarely persist long after the spores have been produced, making definitive identification difficult or impossible in aged specimens. The rating system used by Sporometrics to score the frequency of structures observed microscopically is based on a 5-point assessment of 50-100 microscopic fields, usually taken at 400 x magnification. This system uses the following rating criteria:

Descriptor	Criteria (based on 50-100 fields)	Interpretation of growth <i>in situ</i> according to observations:	
		Spores alone	Spores and spore-bearing structures or mycelia
tr	10 ⁰ -10 ¹ elements in total	growth not indicated	growth not indicated
1+	10 ⁰ -10 ¹ elements per ~25% fields	unclear	growth indicated
2+	10 ¹ -10 ² elements per ~50% fields	growth indicated	growth indicated
3+	10 ² -10 ³ elements per ~75% fields	growth indicated	growth indicated
4+	> 75% fields obscured by elements	growth indicated	growth indicated

**DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT –
NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL**

Appendix J
Evaluation Criteria for Assessing Asbestos-Containing Materials

APPENDIX J
EVALUATION CRITERIA FOR ASSESSING
ASBESTOS-CONTAINING MATERIALS



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Appendix J
Evaluation Criteria for Assessing Asbestos-Containing Materials

CRITERIA FOR ASSESSING ASBESTOS-CONTAINING MATERIALS

A description of the criteria used in evaluating the condition, accessibility and exposure risk of asbestos-containing materials is provided below. The criteria is based on the Public Services and Procurement Canada (PSPC) document entitled *Asbestos Management Standard* (June 5, 2017) and industry standards of practice.

J.1 ASSESSMENT OF CONDITION

J.1.1 Spray Applied Fireproofing, Insulation and Textured Finishes

In evaluating the condition of ACM spray applied as fireproofing, thermal insulation or texture, decorative or acoustic finishes, the following criteria apply:

Good

Surface of material shows no significant signs of damage, deterioration or delamination. Up to one percent visible damage to surface is allowed within range of GOOD. Evaluation of sprayed fireproofing requires the Assessor to be familiar with the irregular surface texture typical of sprayed asbestos products. GOOD condition includes unencapsulated or unpainted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.

Poor

Sprayed materials show signs of damage, delamination or deterioration. More than one percent damage to surface of ACM spray.

In observation areas, where damage exists in isolated locations, both GOOD and POOR condition may be reported. The extent or percentage of each condition will be recorded on the Assessor's assessment form.

FAIR condition is not utilized or considered as a valid criterion in the evaluation of sprayed fireproofing, sprayed insulation, or texture coat finishes.

The evaluation of ACM spray applied as fireproofing, non-mechanical thermal insulation, or texture, decorative or acoustic finishes which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations. Persons entering the ceiling area are advised to be watchful for ACM DEBRIS prior to accessing or working above ceilings in areas of building with ACM, regardless of the reported condition.



DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS ASSESSMENT – NEWBORO LOCK 36 REHABILITATION ON THE RIDEAU CANAL

Appendix J
Evaluation Criteria for Assessing Asbestos-Containing Materials

J.1.2 Other ACM

In evaluating the condition of mechanical insulation (on boilers, breaching, ductwork, piping, tanks, equipment etc.) the following criteria are used:

Good

Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor surface damage (i.e., scuffs or stains), but the jacketing is not penetrated.

Fair

Minor penetration damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges should be minor to none.

Poor

Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired. The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. In these circumstances, it is not possible to observe each foot of mechanical insulation from all angles.

J.1.3 Non-Friable and Potentially Friable Materials

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos cement products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material will be treated as a friable product.

