



**PROJECT SPECIFIC DESIGNATED SUBSTANCE SURVEY
A-WING and C-WING RENOVATION PROJECT
BUILDING 201 – 3851 FALLOWFIELD ROAD, OTTAWA, ONTARIO**

GEC PROJECT No. 29008



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REPORT TO:

MR. BLAIR MURPHY

ON:

**PROJECT SPECIFIC DESIGNATED SUBSTANCE SURVEY
A-WING and C-WING RENOVATION PROJECT
BUILDING 201 – 3851 FALLOWFIELD ROAD, OTTAWA, ONTARIO**

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JANUARY, 2016

EXECUTIVE SUMMARY

Greenough Environmental Consulting Inc. (GEC) was commissioned by the Canadian Food Inspection Agency (CFIA) under the direction of Mr. Blair Murphy, to provide a designated substance report (DSR) for the upcoming A-Wing and C-Wing renovation project within building 201 located at 3851 Fallowfield Road in Ottawa, Ontario.

The purpose of the investigation was to identify the quantity, location, and condition of designated substances located within the proposed project areas.

For the purpose of this survey, GEC made reference to the results obtained within the initial building survey completed by TROW (2003), as well as additional project specific DSRs completed within the building by GEC in recent years.

Based on the visual inspections of the accessible areas conducted during the survey and analytical results, asbestos-containing materials (ACMs) and lead-containing paints have been identified within the project areas. Silica and mercury are assumed present in select building materials. Other designated substances may be present in low concentrations in building materials, paints and adhesives within the project areas but they do not represent a concern to occupational health at this time.

A summary of the designated substance survey results is presented in **Table 1**.

TABLE 1 – SUMMARY OF RESULTS & RECOMMENDATIONS		
PROJECT SPECIFIC DESIGNATED SUBSTANCE SURVEY		
A-WING and C-WING RENOVATION PROJECT		
BUILDING 201 – 3851 FALLOWFIELD ROAD, OTTAWA, ONTARIO – JANUARY 2016		
Component	Comments	Recommendations
Acrylonitrile	None identified.	No recommendations warranted at this time.
Arsenic	None identified.	No recommendations warranted at this time.

<p>Asbestos</p>	<p>Based on the findings of this survey as well as previous and current analytical results, the following <u>non-friable</u> asbestos-containing material (ACM) has been identified within the project areas.</p> <ul style="list-style-type: none"> • Drywall Joint Compound; • Acoustic Ceiling Tiles. • Brown Duct Sealant <p>Based on the findings of this survey as well as previous and current analytical results, the following <u>friable</u> asbestos-containing materials (ACMs) have been identified within the project areas.</p> <ul style="list-style-type: none"> • Textured Ceiling/Wall Finish. • Sheet Vinyl Flooring with paper backing 	<p><u>Project Specific Recommendations:</u></p> <ul style="list-style-type: none"> ○ Prior to the planned renovations, all Acoustic Ceiling Tiles, Brown Duct Sealant, Sheet Vinyl Flooring, drywall joint compound and textured ceiling/wall finish that will be or has the potential to be disturbed, must be removed in accordance with the procedures outlined in Ontario Regulation 278/05 as well as the PWGSC Policy regarding Asbestos Management. <p><u>General Recommendations:</u></p> <ul style="list-style-type: none"> ○ Suspect materials identified during renovation and/or demolition activities not discussed in this report herein should be treated as ACMs unless proven otherwise through material specific sampling and analysis in accordance with the requirements of Ontario Regulation 278/05. ○ That the roles and responsibility of “the owner” as stipulated in Section 8 of Ontario Regulation 278/05 be recognized and adhered to including, but not limited to, notification to occupiers and workers as well as training. ○ Ontario Regulation 490/09, as amended to O. Reg. 148/12 - Designated Substance - made under the Occupational Health and Safety Act states that airborne levels of asbestos fibres should not exceed 0.1 f/cc.
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Benzene	None identified.	No recommendations warranted at this time.
Coke Oven Emissions	None identified.	No recommendations warranted at this time.
Ethylene Oxides	None identified.	No recommendations warranted at this time.
Isocyanates	None identified.	No recommendations warranted at this time.
Lead	<p>Based on the laboratory analysis a minor concentrations of lead (286 - <20µg/g) was detected in the paint finishes sampled.</p> <p>Paint surfaces were generally found to be in good condition with minor localized blistering or peeling observed.</p> <p>Based on the age of the building and historical applications, lead is assumed to be present in solder on joints of copper piping, caulking in bell fittings associated with cast iron drainage pipe joints and used on electrical wiring/systems (where observed within the renovation areas).</p>	<p>In the event that any work is conducted that has the potential to create airborne lead, every employer shall take all necessary measures and procedures by means of engineering controls, work practices and hygiene practices and facilities as outlined in the Ontario Ministry of Labour Guideline - Lead on Construction Projects dated April 2011.</p> <p>Every employer shall also ensure that the time-weighted average exposure of a worker to airborne lead, except tetraethyl lead, shall not exceed 0.05 milligrams lead per cubic metre of air, and in the case of exposure to tetraethyl lead 0.10 milligrams lead per cubic metre of air as per O.Reg 490/09, as amended to 148/12.</p> <p>The disposal of construction waste containing lead is controlled by Ontario Regulation 347/90 as amended to O. Reg. 302/14 – General Waste Management, under the Ontario Environmental Protection Act. Leachate tests for lead in construction waste must not exceed 5 mg/L in order to be disposed of at a local landfill without treatment.</p>
Mercury	Mercury vapour is present in	Mercury or mercury vapour within

	<p>fluorescent light tubes identified throughout the survey areas. Additionally, mercury may also be present within thermostats, switches and thermometers (where present).</p> <p>Based on the age of the building and historical applications, mercury is also assumed to be present in painted surfaces; however, sampling of mercury in painted surfaces was not performed for the purpose of this survey.</p>	<p>fluorescent light tubes and other equipment poses no risk to occupants provided the mercury containers remain intact.</p> <p>Best management practice for disposal of mercury-containing light tubes is to participate in the manufacturer's recycling program or to release the material to an approved waste carrier for disposal and/or recycling.</p> <p>Exposure to mercury in industrial establishments is regulated under O. Reg. 490/09, amended to O. Reg. 148/12. The TWA should not exceed 0.025 mg/m³ for all forms except alkyl compounds. Alkyl compounds of mercury should not exceed 0.01 mg/m³.</p> <p>All waste material including switches, thermostats and thermometers, must be handled and disposed of according to O. Reg. 347, amended to O. Reg. 302/14. Leachate tests for mercury in construction waste must not exceed 0.1 mg/L in order to be disposed of at a local landfill without treatment.</p>
Silica	<p>Based on the age of the building and historical applications, silica is assumed to be present in gypsum (drywall), drywall joint compound, poured concrete, concrete block and cement mortar identified within the proposed renovation areas (where applicable).</p>	<p>Silica dust can be generated by drilling, coring, blasting, grinding, crushing and sandblasting silica-containing materials.</p> <p>Prior to any renovation or demolition, ensure that all necessary measures and procedures by means of engineering controls, work practices and hygiene practices and facilities are implemented as</p>

	The potential for the generation of airborne silica dust exists when manipulating the noted building materials.	outlined in the Ontario Ministry of Labour Guideline - Silica on Construction Projects dated April 2011 Every employer shall also ensure that the TWAEV of a worker to silica is reduced to the lowest practical level and in any event shall not exceed 0.05 milligrams per cubic metre of air by volume for cristobalite and tridymite, and 0.10 milligrams silica per cubic metre of air by volume for quartz and tripoli.
Vinyl Chloride	Likely present in stable form in pipes, paints and finishes.	No recommendations warranted at this time.

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- Appendix 1** – Current Asbestos Analytical – January 2016
- Appendix 2** – Current Lead Analytical – January 2016
- Appendix 3** – Photos

1.0 INTRODUCTION

Greenough Environmental Consulting Inc. (GEC) was commissioned by the Canadian Food Inspection Agency (CFIA) under the direction of Mr. Blair Murphy, to provide a designated substance report (DSR) for the upcoming A-Wing and C-Wing renovation project within building 201 located at 3851 Fallowfield Road in Ottawa, Ontario.

The purpose of the investigation was to identify the quantity, location, and condition of designated substances located within the proposed renovation areas.

For the purpose of this survey, GEC made reference to the results obtained within the initial building survey completed by TROW (2003), as well as additional project specific DSRs completed within the building by GEC in recent years.

All DSR work meets the requirements of Section 30 of the Ontario Occupational Health and Safety Act and WHMIS Regulation (formerly Bill 208).

2.0 SCOPE AND METHODOLOGY

The scope of work followed during the assessment was in accordance with the scope of work agreed upon by GEC and CFIA.

All work was conducted in accordance with provincial regulations (O. Reg 490/09 and 278/05).

The survey included the following designated substances:

- Acrylonitrile
- Arsenic
- Asbestos
- Benzene
- Coke oven Emissions
- Ethylene Oxide
- Isocyanates
- Lead
- Mercury
- Silica
- Vinyl Chloride

Materials suspected to contain designated substances, were visually identified based on the surveyor's knowledge as well as historical application of building components. Where permitted, visual identification of materials suspected to contain asbestos was supported by the collection and analysis of representative samples as directed by the Client. Asbestos bulk sampling was performed by GEC in order to meet the current minimum sampling requirements of Ontario Regulation 278/05 - Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05), as amended.

In Ontario, a material is defined as an ACM if the material has a minimum asbestos content of 0.5% by dry weight. ACMs are divided into two categories: friable and non-friable materials. A friable ACM is a material that can be crumbled, powdered, pulverized or reduced to dust by hand or moderate pressure. Friable materials can readily release fibres when disturbed. Common applications of friable ACMs are sprayed or trowelled surfacing materials (e.g. sprayed fireproofing and textured coatings) as well as mechanical and thermal insulations. Non-friable materials will generally release fibres only when cut, broken or have deteriorated to the point where the binding agents of the material begin to fail. Common non-friable ACMs include drywall joint compound, plaster, textile products (gaskets etc.) and asbestos cement (Transite). It must be noted that some materials, although non-friable intact, become friable upon manipulation (i.e. plaster, ceiling tile etc.).

Bulk samples of suspected ACMs collected by GEC during the site investigation were analyzed for asbestos content at Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario. The bulk asbestos samples were analyzed using a combination of dispersion staining and Polarised Light Microscopy (PLM). This analytical method complies with the United States Environmental Protection Agency (U.S. EPA) Method 600/R-93/116 dated July, 1993. Paracel is certified under the National Institute of Science and Technology's National Voluntary Laboratory Accreditation Program (NVLAP) to perform asbestos bulk sample analysis (NVLAP No. 200812-0).

The laboratory utilizes a "positive-stop" analysis methodology and stopped analysis for the particular set of samples once asbestos concentrations at or above 0.5% is detected. Therefore, samples taken in order to satisfy the requirements of O. Reg. 278/05, were not analyzed if the previous sample was identified as asbestos-containing. **Appendix 1** presents the current asbestos analytical results obtained for the purpose of this survey.

For the purpose of this survey, GEC collected paint chip samples of predominant paint finishes within the specified project areas and submitted the samples to Paracel Laboratories for analysis.

Paracel has received its Certificate of Laboratory Proficiency from the Canadian Association of Environmental Analytical Laboratories (CAEAL) and has achieved accreditation from the Standard Council of Canada.

Analysis of paint chip samples is performed using MOE E3470 (which utilizes EPA Method 6020) which describes the multi-elemental determination of analyses by ICP-OES in environmental samples. The method measures ions produced by a radio-frequency inductively coupled plasma. Analyte species originating in a liquid are nebulized and the resulting aerosol is transported by argon gas into the plasma torch. The ions produced by high temperatures are entrained in the plasma gas and introduced, by means of an interface, into a mass spectrometer. The ions produced in the plasma are sorted according to their mass-to-charge ratios and quantified with a channel electron multiplier. Interferences must be assessed and valid corrections applied, or the data flagged to indicate problems. Interference correction must include compensation for background ions contributed by the plasma gas, reagents, and constituents of the sample matrix. Prior to analysis, samples which require total values must be acid digested using appropriate sample preparation methods.

Inductively coupled plasma-optical emission spectrometry (ICP/OES) is applicable to the determination of sub-ug/L concentrations of a large number of elements in water samples and in waste extracts or digests. When dissolved constituents are required, samples must be filtered and acid-preserved prior to analysis. No digestion is required prior to analysis for dissolved elements in water samples. Acid digestion prior to filtration and analysis is required for groundwater, aqueous samples, industrial wastes, soils, sludges, sediments, and other solid wastes for which total (acid-leachable) elements are required. **Appendix 2** presents the lead analytical results obtained for the purpose of this survey.

3.0 SURVEY LIMITATIONS

This report reflects the observations of the accessed areas and analysis of materials sampled during the current survey. Additional designated substances and hazardous materials exist outside the surveyed areas but they are beyond the scope of this survey.

GEC cannot warrant against the discovery of additional ACMs or presence of other designated substances inside wall cavities, closed bulkheads and closed ceilings due to the non-destructive nature of this survey.

The site investigation was completed by Mr. Derek R. Stashick (Environmental Consultant) on January 15th, 2016. Observations expressed in this document apply only to conditions on this date and within the subject areas.

4.0 RESULTS

The results of the designated substances survey are discussed below.

4.1 Acrylonitrile

Acrylonitrile is used in production of synthetics and may be present in stable form in paints and adhesives. Over time, acrylonitrile will volatilize out of these materials but it is not expected that acrylonitrile concentrations will exceed the maximum allowable Time Weighted Average limit (TWA) of 2 ppm (parts per million) of air for occupants of the structure.

4.2 Arsenic

Arsenic, or arsenic-containing compounds, may be present in stable form in paints and adhesives. Provided these materials remain in good condition, it is not expected that arsenic concentrations will exceed the maximum allowable TWA of 0.01 mg/m³ of air for occupants of the subject area.

4.3 Asbestos

For the purpose of this DSR, GEC referenced existing documentation (TROW 2003) as well as additional project specific DSRs completed recently by GEC. Additionally, GEC collected samples of suspect asbestos-containing materials (ACM's) identified within the proposed project areas for laboratory analysis.

Table 2 provides a summary of previously completed sampling by GEC as it relates to the current survey.

TABLE 2 – PREVIOUS RELEVANT ASBESTOS ANALYTICAL RESULTS – BUILDING 201			
3851 FALLOWFIELD ROAD, OTTAWA, ONTARIO			
Sample Reference	Building Material Description	Location of Sample(s)	Result & Type
SAMPLING CONDUCTED BY GEC – JANUARY 2016			
TROW 2003	Ceiling/Wall Plaster	Throughout	ND
GEC 2016	Drywall Joint Compound	Throughout	1% CH

- ND = No Asbestos Detected
- CH = Chrysotile Asbestos
- * Definition of an "Asbestos-containing material" as defined by the Ontario Ministry of Labour Regulation 278/05 is any material found to contain 0.5% or greater asbestos by dry weight.

Table 3 provides results for asbestos analytical data collected during the current survey.

TABLE 3 – CURRENT ASBESTOS ANALYTICAL RESULTS – BUILDING 201			
3851 FALLOWFIELD ROAD, OTTAWA, ONTARIO			
Sample Reference	Building Material Description	Location of Sample(s)	Result & Type
SA-01(A)	Sheet Vinyl Flooring – Beige with Stone Pattern and Paper Backing	A-Wing – 4 th Floor Corridor	10% CH
SA-02(A)	Plaster – Grey Base Layer (Confirmation)	A-Wing – 3 rd Floor	ND
	Plaster – White Surface Layer (Confirmation)		ND
SA-03(A)	Brown Duct Sealant	A-Wing Ceiling Space	1.56% CH
SA-04(A-C)	Brown Vinyl Baseboard with Adhesive	A-Wing – 2 nd Floor Corridor	ND
SA-05(A-C)	Grout Associated with Ceiling Grid System	A-Wing - Throughout	ND
SA-06(A)	Acoustic Ceiling Tile – 60cm x 120cm – Patterned Pinholes with Pink Back	A-Wing – 4 th Floor	0.77% AM 2.32 CH
SA-07(A)	Textured Ceiling Finish	C-Wing – Front Lobby	3% CH
SA-08(A-C)	Carpet Adhesive	C-Wing – Corridor	ND
SA-09(A-C)	Drywall Joint Compound	C-Wing – Corridor	ND

- ND = No Asbestos Detected
- CH = Chrysotile Asbestos
- AM = Amosite Asbestos
- * Definition of an "Asbestos-containing material" as defined by the Ontario Ministry of Labour Regulation 278/05 is

any material found to contain 0.5% or greater asbestos by dry weight.

Vinyl Flooring Materials:

Flooring materials identified in the surveyed areas consisted of sheet vinyl flooring ceramic tile or carpet. Analytical results for the sampling of flooring as they relate to this survey are summarized below:

- Three (3) samples (SA-01A/B/C) of a sheet vinyl flooring of a beige sheet vinyl flooring (stone pattern with paper backing) were collected from the 4th Floor A-Wing Corridor for analysis. Based on the laboratory analysis, the vinyl flooring was found to contain **10% Chrysotile asbestos**.
 - This particular style of sheet vinyl flooring was identified as the primary flooring material within A-Wing.
 - Any manipulation of this particular style of sheet vinyl flooring must be completed in accordance with the procedures outlined in O.Reg 278/05.

Based on the on-site observations, asbestos-containing flooring materials were identified within the surveyed areas.

Wall Systems:

Wall systems within the surveyed areas consisted of concrete, plaster, ceramic tile, and gypsum board (drywall) with asbestos-containing drywall joint compound.. Analytical results for the sampling of wall systems as they relate to this survey are summarized below:

- Three (3) samples (SA-09A/B/C) of drywall joint compound were collected from the C-Wing corridor and submitted for laboratory analysis. Based on the laboratory analysis, completed in accordance with the sampling requirements outlined in O.Reg 278/05, no asbestos was identified in the samples analysed.
 - Previous samples (GEC 2016) of drywall joint compound were collected from various areas within the building outside the project area for analysis. Based on the laboratory analysis, the samples were found to contain **1% Chrysotile asbestos**.
 - All homogeneous drywall joint compound within the building must be treated as an ACM.
 - Any manipulation of drywall with asbestos-containing drywall joint

compound must be completed in accordance with the procedures outlined in O.Reg 278/05.

- Previous samples (TROW 2003) of ceiling/wall plaster were collected from various areas throughout the building and submitted for laboratory analysis. Based on the previous findings, no asbestos was identified in the samples analysed.
 - One confirmation sample (SA-02A) was collected from the 3rd floor A-Wing corridor for analysis. Based on the laboratory analysis, no asbestos was identified in the sample analysed.

Based on the previous laboratory data as well as on-site observations, asbestos-containing drywall joint compound has been identified within the surveyed areas.

Ceiling Systems:

Ceiling systems within the surveyed areas consisted of acoustic ceiling tiles, gypsum board (drywall) with asbestos-containing drywall joint compound, and asbestos-containing textured ceiling finish. Analytical results for the sampling of ceiling systems as they relate to this survey are summarized below:

- Three (3) samples (SA-09A/B/C) of drywall joint compound were collected from the C-Wing corridor and submitted for laboratory analysis. Based on the laboratory analysis, completed in accordance with the sampling requirements outlined in O.Reg 278/05, no asbestos was identified in the samples analysed.
 - Previous samples (GEC 2016) of drywall joint compound were collected from various areas within the building outside the project area for analysis. Based on the laboratory analysis, the samples were found to contain **1% Chrysotile asbestos**.
 - All homogeneous drywall joint compound within the building must be treated as an ACM.
 - Any manipulation of drywall with asbestos-containing drywall joint compound must be completed in accordance with the procedures outlined in O.Reg 278/05.
- Three (3) samples (SA-07A/B/C) of a textured ceiling/wall finish were collected from within the C-Wing Lobby area for analysis. Based on the laboratory analysis, SA-07A was found to contain **3% Chrysotile asbestos**.

- All textured ceiling finish within the project area must be treated as an ACM.
 - Any manipulation of textured wall finish must be completed in accordance with the procedures outlined in O.Reg 278/05.
- Three (3) samples (SA-06A/B/C) of an acoustic ceiling tile (60cm x 120cm with patterned pinholes and pink back) were collected from the 4th floor A-Wing corridor and submitted for laboratory analysis. Based on the laboratory analysis, SA-06A was found to contain **2.32% Chrysotile asbestos** and **0.77 Amosite asbestos**.
 - All visually similar acoustic ceiling tiles within the project area must be treated as an ACM.
 - Any manipulation of the acoustic ceiling tiles must be completed in accordance with the procedures outlined in O.Reg 278/05.

Based on the laboratory data as well as on-site observations, asbestos-containing drywall joint compound, textured ceiling finish, and acoustic ceiling tiles have been identified within the surveyed areas

Mechanical Insulations:

Insulation on mechanical systems within the surveyed area consisted of fibreglass, or mechanical systems were uninsulated. As fibreglass is not suspected to contain asbestos, no sampling was completed of this material.

Based on the on-site observations, no asbestos-containing mechanical insulation was identified within the surveyed areas. However, based on the age of the building, and previous survey findings the potential exists for asbestos-containing mechanical insulations to be present in concealed locations.

Miscellaneous Materials:

Analytical results for the sampling of miscellaneous materials as they relate to this survey are summarized below:

- Three (3) samples (SA-03A/B/C) of a brown duct sealant were collected from the A-Wing ceiling space and submitted for laboratory analysis. Based on the laboratory analysis, SA-03A was found to contain **1.56% Chrysotile asbestos**.
 - All brown duct sealant finish within the project area must be treated as an ACM.

- Any manipulation of the brown duct sealant must be completed in accordance with the procedures outlined in O.Reg 278/05.
- Three (3) samples (SA-04A/B/C) of a brown vinyl baseboard and associated adhesive were collected from the 2nd floor A-wing corridor and submitted for laboratory analysis. Based on the laboratory analysis, completed in accordance with the sampling requirements outlined in O.Reg 278/05, no asbestos was identified in the samples analysed.
- Three (3) samples (SA-05A/B/C) of a grey grout associated with the ceiling grid were collected throughout the A-Wing corridors and submitted for laboratory analysis. Based on the laboratory analysis, completed in accordance with the sampling requirements outlined in O.Reg 278/05, no asbestos was identified in the samples analysed.
- Three (3) samples (SA-08A/B/C) of a carpet adhesive were collected throughout the C-Wing corridor and submitted for laboratory analysis. Based on the laboratory analysis, completed in accordance with the sampling requirements outlined in O.Reg 278/05, no asbestos was identified in the samples analysed.

Based on the on-site observations, asbestos-containing brown duct sealant was identified within the surveyed areas. However, based on the age of the building, the potential exists for additional asbestos-containing mechanical miscellaneous materials to be present in concealed locations.

4.4 Benzene

Benzene is likely present in a stable form within roofing materials, paints and adhesives. Over time, the benzene component volatilizes out of these materials and is released into the ambient air. It is expected that only trace amounts of benzene presently exist in the building materials at the site. It is unlikely that benzene emissions from the building materials on site will exceed the maximum allowable TWAEV of 0.5ppm or occupants of the subject area.

4.5 Coke Oven Emissions

Coke oven emissions are the exhaust released during the burning process of coke (pure carbon). This process was not observed and is not expected to take place within this building; therefore, it is unlikely that coke oven emission concentrations will exceed the maximum allowable TWAEV of 0.15 mg/m³ for occupants for the subject area.

4.6 Ethylene Oxides

Ethylene oxides are used in production of many foams, adhesives and paints. Over time, ethylene oxide will volatilize out of these materials and may be present in trace amounts in the ambient air in the area. It is not expected that ethylene oxide levels will become hazardous to occupants of the subject area.

4.7 Isocyanates

Isocyanates are raw materials from which all polyurethane products are made. Over time, isocyanates may volatilize out of these materials but will only be present in trace amounts and are not expected to exceed the maximum allowable TWAEV of 0.005-0.02ppm (depending on type of isocyanate present) for occupants of the subject area.

4.8 Lead

In 1976, the Hazardous Products Act limited the amount of lead in interior paint to 0.5 % by weight (5,000 µg/g). Over the years, the amount of lead in paint has continued to decrease due to cooperative efforts of government and industry.

Based on the laboratory analysis, a minor concentration of lead (27µg/g) was detected in the painted finish within the surveyed areas.

Analytical results for the lead sampling conducted are summarized in Table 4.

TABLE 4 – BUILDING 201, 3851 FALLOWFIELD ROAD, OTTAWA, ON			
B-WING RENOVATION PROJECT – CURRENT LEAD ANALYTICAL RESULTS – JANUARY 2016			
Sample Reference	Building/Item/Location	Surface Colour	Results (ug/g Lead)
LS-01	C-Wing – Wall Paint	Beige	<33
LS-02	C-Wing – Wall Paint	White	286
LS-03	A-Wing – Wall Paint	White	<20

Paint surfaces were generally found to be in good condition with minor localized blistering or peeling observed.

Based on the age of the building and historical applications, lead is assumed to be present in solder on joints of copper piping, caulking in bell fittings associated with cast iron drainage pipe joints and used on electrical wiring/systems (where observed within the renovation areas).

4.9 Mercury

Mercury vapour is present in fluorescent light tubes identified throughout the survey areas. Additionally, mercury may also be present within thermostats, switches and thermometers (where present).

Based on the age of the building and historical applications, mercury is also assumed to be present in painted surfaces; however, sampling of mercury in painted surfaces was not performed for the purpose of this survey.

4.10 Silica

Based on the age of the building and historical applications, silica is assumed to be present in gypsum (drywall), brick, acoustic ceiling tiles, plaster, drywall joint compound, poured concrete, concrete block and cement mortar identified within the proposed renovation areas (where applicable).

The potential for the generation of airborne silica dust exists when manipulating any of the noted building materials.

4.11 Vinyl Chloride

Vinyl chloride may be present in paints and finishes. Over time, vinyl chloride will volatilize out of these materials but will only be present in trace amounts and is not expected to exceed the maximum allowable TWA_{EV} of 1ppm for occupants of the subject area.

5.0 RECOMMENDATIONS

5.1 Asbestos

The following recommendations are made respecting Ontario Regulation 278/05:

Project Specific Recommendations:

- Prior to the planned renovations, all sheet vinyl flooring, drywall joint compound, brown duct sealant, acoustic ceiling tiles and textured ceiling finish that will be or has the potential of being disturbed, must be removed in accordance with the procedures outlined in Ontario Regulation 278/05 as well as the PWGSC Policy regarding Asbestos Management.

General Recommendations:

- Suspect materials identified during renovation and/or demolition activities not discussed in this report herein should be treated as ACMs unless proven otherwise through material specific sampling and analysis in accordance with the requirements of Ontario Regulation 278/05.
- That the roles and responsibility of “the owner” as stipulated in Section 8 of Ontario Regulation 278/05 be recognized and adhered to including, but not limited to, notification to occupiers and workers as well as training.
- Ontario Regulation 490/09, as amended to O. Reg. 148/12 - Designated Substance - made under the Occupational Health and Safety Act states that airborne levels of asbestos fibres should not exceed 0.1 f/cc.

5.2 Lead

In the event that any work is conducted that has the potential to create airborne lead, every employer shall take all necessary measures and procedures by means of engineering controls, work practices and hygiene practices and facilities as outlined in the Ontario Ministry of Labour Guideline - Lead on Construction Projects dated April 2011.

Every employer shall also ensure that the time-weighted average exposure of a worker to airborne lead, except tetraethyl lead, shall not exceed 0.05 milligrams lead per cubic metre of air, and in the case of exposure to tetraethyl lead 0.10 milligrams lead per cubic metre of air as per O.Reg 490/09, as amended to 148/12.

The Occupational Health and Safety Branch of the Ontario Ministry of Labour have published Guideline: Lead on Construction Projects. This document classifies all lead disturbances as Type 1, Type 2a, Type 2b or Type 3 work, and assigns alternate levels of respiratory protection and work procedures for each type of task being performed.

Lead is confirmed and/or assumed to be present in the following materials:

- Painted surfaces (confirmed);
- Caulking in cast iron drainage pipe joints (assumed);
- Solder on the joints of copper pipes (assumed); and
- Solder on Electrical wiring / equipment etc. (assumed).

When piping or wiring is removed during demolition activities, copper and drainage piping or wiring can be cut a small distance (e.g., 5cm) from the joints to avoid disturbance of the solder and joint caulking suspected to contain lead.

The disposal of construction waste containing lead is controlled by Ontario Regulation 347/90 as amended to O. Reg. 302/14 – General Waste Management, under the Ontario Environmental Protection Act. Leachate tests for lead in construction waste must not exceed 5 mg/L in order to be disposed of at a local landfill without treatment.

5.3 Mercury

Mercury or mercury vapour within fluorescent light tubes and other equipment poses no risk to occupants provided the mercury containers remain intact.

Best management practice for disposal of mercury-containing light tubes is to participate in the manufacturer's recycling program or to release the material to an approved waste carrier for disposal and/or recycling.

Exposure to mercury in industrial establishments is regulated under O. Reg. 490/09, amended to O. Reg. 148/12. The TWA should not exceed 0.025 mg/m³ for all forms except alkyl compounds. Alkyl compounds of mercury should not exceed 0.01 mg/m³.

All waste material including switches, thermostats and thermometers, must be handled and disposed of according to O. Reg. 347, amended to O. Reg. 302/14. Leachate tests for mercury in

construction waste must not exceed 0.1 mg/L in order to be disposed of at a local landfill without treatment.

5.4 Silica

Silica dust can be generated by drilling, coring, blasting, grinding, crushing and sandblasting silica-containing materials.

Prior to any renovation or demolition, ensure that all necessary measures and procedures by means of engineering controls, work practices and hygiene practices and facilities are implemented as outlined in the Ontario Ministry of Labour Guideline - Silica on Construction Projects dated April 2011

Every employer shall also ensure that the TWAEV of a worker to silica is reduced to the lowest practical level and in any event shall not exceed 0.05 milligrams per cubic metre of air by volume for cristobalite and tridymite, and 0.10 milligrams silica per cubic metre of air by volume for quartz and tripoli.

- Segregate the work area from the rest of the building to reduce the risk of exposing building occupants to silica dust. Workers leaving the work area should pass through a designated clean room where excess dust can be brushed off clothes and facilities are available to wash dust off skin.
- The work surface should be wetted regularly to limit dust released during striking and abrasion.
- Everyone in the work area should be provided with a half-face respirator equipped with HEPA filters.
- Ensure that all necessary measures and procedures by means of engineering control, work and hygiene practices are implemented to ensure that the TWAEV of a worker to silica is reduced to the lowest practical level and in any event shall not exceed 0.05 mg/m³ of air for cristobalite and tridymite, and 0.10 mg/ m³ of air for quartz and tripoli.

6.0 CLOSURE

This report has been prepared for the sole benefit of the Client and their intended use. The report may not be relied upon by any other person or entity without the written consent of Greenough Environmental Consulting Inc. (GEC), and the Client.

GEC accepts no responsibility for any use that an outside party makes of this report and any reliance on decisions made based on it, are the responsibility of such parties.

This report was not intended to provide direction or procedures for the handling of designated substances and hazardous materials. Only persons with documented, current training in the safe handling of the designated substances and hazardous materials should handle them. Persons handling any of designated substances and/or hazardous materials identified in this survey, or conducting work in the vicinity of these materials are advised to consult this survey and individuals with appropriate experience and training, prior to doing so.

The conclusions presented represent the best judgment of the assessor based on current environmental standards. Due to the nature of the investigation and the limited data available, the assessor cannot warrant against undiscovered environmental liabilities.

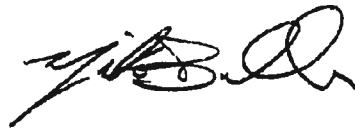
We trust that the report meets your current requirements. Should you have any questions or concerns regarding the above, please do not hesitate to contact the undersigned.

Yours Truly,

GREENOUGH ENVIRONMENTAL CONSULTING INC.



Derek R. Stashick, B.Ed, WRT, CMI, C-NRPP
Environmental Consultant



Michael P. Buller, B.A. (Hons), ROHT, CRSP, CMI
Vice President

APPENDIX 1

CURRENT ASBESTOS ANALYTICAL – JANUARY 2016

Certificate of Analysis

Greenough Environmental Consulting Inc.

29 Capital Drive
Ottawa, ON K2C 0E7
Attn: Derek Stashick

Phone: (613) 792-4125
Fax: (613) 792-1077

Client PO:
Project: 29008
Custody:

Report Date: 20-Jan-2016
Order Date: 18-Jan-2016

Order #: 1604081

This Certificate of Analysis contains analytical data applicable to the following samples as submitted :

Paracel ID	Client ID		
1604081-01	SA-01A	1604081-23	SA-07C
1604081-02	SA-01B	1604081-24	SA-08A
1604081-03	SA-01C	1604081-25	SA-08B
1604081-04	SA-02A (Grey)	1604081-26	SA-08C
1604081-05	SA-02A (White)	1604081-27	SA-09A
1604081-06	SA-03A	1604081-28	SA-09B
1604081-07	SA-03B	1604081-29	SA-09C
1604081-08	SA-03C		
1604081-09	SA-04A (Baseboard)		
1604081-10	SA-04B (Baseboard)		
1604081-11	SA-04C (Baseboard)		
1604081-12	SA-04A (Adhesive)		
1604081-13	SA-04B (Adhesive)		
1604081-14	SA-04C (Adhesive)		
1604081-15	SA-05A		
1604081-16	SA-05B		
1604081-17	SA-05C		
1604081-18	SA-06A		
1604081-19	SA-06B		
1604081-20	SA-06C		
1604081-21	SA-07A		
1604081-22	SA-07B		

Approved By:



Emma Diaz For Heather S.H. McGregor, BSc
Laboratory Director - Microbiology

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work

Client: Greenough Environmental Consulting Inc.
29 Capital Drive
Ottawa, ON K2C 0E7

Attn: Derek Stashick
Tel: (613) 792-4125
Fax: (613) 792-1077

Project: 29008
Parcel Report No.: 1604081

Received Date: 18-Jan-16
Report Date: 20-Jan-16

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Parcel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1604081-01	15-Jan-16	sample homogenized	Grey	Sheet Vinyl Flooring	Yes	Client ID: SA-01A Chrysotile Non-Fibers	10 90
1604081-02	15-Jan-16					Client ID: SA-01B not analyzed	
1604081-03	15-Jan-16					Client ID: SA-01C not analyzed	
1604081-04	15-Jan-16	sample homogenized	Grey	Plaster	No	Client ID: SA-02A (Grey) Non-Fibers	100
1604081-05	15-Jan-16	sample homogenized	White	Plaster	No	Client ID: SA-02A (White) Non-Fibers	100
1604081-06	15-Jan-16	sample homogenized	Brown	Sealant	Yes	Client ID: SA-03A Chrysotile Non-Fibers	1.56 98.44
1604081-07	15-Jan-16					Client ID: SA-03B not analyzed	
1604081-08	15-Jan-16					Client ID: SA-03C not analyzed	
1604081-09	15-Jan-16	sample homogenized	Brown	Baseboard	No	Client ID: SA-04A (Baseboard) Non-Fibers	100
1604081-10	15-Jan-16	sample homogenized	Brown	Baseboard	No	Client ID: SA-04B (Baseboard) Non-Fibers	100
1604081-11	15-Jan-16	sample homogenized	Brown	Baseboard	No	Client ID: SA-04C (Baseboard) Non-Fibers	100
1604081-12	15-Jan-16	sample homogenized	Brown	Adhesive	No	Client ID: SA-04A (Adhesive) Non-Fibers	100
1604081-13	15-Jan-16	sample homogenized	Brown	Adhesive	No	Client ID: SA-04B (Adhesive) Non-Fibers	100
1604081-14	15-Jan-16	sample homogenized	Brown	Adhesive	No	Client ID: SA-04C (Adhesive) Non-Fibers	100

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KINGSTON
1058 Gardiners Rd.
Kingston, ON K7P 1R7

Client: Greenough Environmental Consulting Inc.
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Attn: Derek Stashick
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Project: 29008
Paracel Report No.: 1604081

Received Date: 18-Jan-16
Report Date: 20-Jan-16

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1604081-15	15-Jan-16	sample homogenized	Grey	Grout	No	Client ID: SA-05A Non-Fibers	100
1604081-16	15-Jan-16	sample homogenized	Grey	Grout	No	Client ID: SA-05B Non-Fibers	100
1604081-17	15-Jan-16	sample homogenized	Grey	Grout	No	Client ID: SA-05C Non-Fibers	100
1604081-18	15-Jan-16	sample homogenized	White/Brown	Ceiling Tile	Yes	Client ID: SA-06A [AS-PRE] Amosite Chrysotile Cellulose MMVF Non-Fibers	0.77 2.32 40 30.9 26.01
1604081-19	15-Jan-16					Client ID: SA-06B not analyzed	
1604081-20	15-Jan-16					Client ID: SA-06C not analyzed	
1604081-21	15-Jan-16	sample homogenized	Grey	Stipple	Yes	Client ID: SA-07A Chrysotile Non-Fibers	3 97
1604081-22	15-Jan-16					Client ID: SA-07B not analyzed	
1604081-23	15-Jan-16					Client ID: SA-07C not analyzed	
1604081-24	15-Jan-16	sample homogenized	Yellow	Adhesive	No	Client ID: SA-08A [AS-PRE] Non-Fibers	100
1604081-25	15-Jan-16	sample homogenized	Yellow	Adhesive	No	Client ID: SA-08B [AS-PRE] Non-Fibers	100
1604081-26	15-Jan-16	sample homogenized	Yellow	Adhesive	No	Client ID: SA-08C [AS-PRE] Non-Fibers	100

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Client: Greenough Environmental Consulting Inc.
29 Capital Drive
Ottawa, ON K2C 0E7

Attn: Derek Stashick
Tel: (613) 792-4125
Fax: (613) 792-1077

Project: 29008
Parcel Report No.: 1604081

Received Date: 18-Jan-16
Report Date: 20-Jan-16

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Parcel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1604081-27	15-Jan-16	sample homogenized	Grey	Drywall Joint Compound	No	Client ID: SA-09A Cellulose Non-Fibers	1 99
1604081-28	15-Jan-16	sample homogenized	Grey	Drywall Joint Compound	No	Client ID: SA-09B Cellulose Non-Fibers	1 99
1604081-29	15-Jan-16	sample homogenized	Grey	Drywall Joint Compound	No	Client ID: SA-09C Cellulose Non-Fibers	1 99

MMVF: Man Made Vitreous Fibers: Fiberglass, Mineral Wool, Rockwool, Glasswool

Analytes in bold indicate asbestos content which may include:

Actinolite, Amosite, Anthophyllite, Chrysotile, Crocidolite and/or Tremolite.

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	Ottawa West Lab	200812-0	20-Jan-16

* Reference to the NVLAP term does not permit the user of this report to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Report Notes

AS-PRE Due to the difficult nature of the bulk sample (interfering fibers/binders), additional NOB preparation was required prior to analysis

Work Order Revisions / Comments

None

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APPENDIX 2

CURRENT LEAD ANALYTICAL – JANUARY 2016

Certificate of Analysis

Greenough Environmental Consulting Inc.

29 Capital Drive
Ottawa, ON K2C 0E7
Attn: Derek Stashick

Client PO:
Project: 29008
Custody:

Report Date: 20-Jan-2016
Order Date: 18-Jan-2016

Order #: 1604111

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
1604111-01	LS-01
1604111-02	LS-02
1604111-03	LS-03

Approved By: _____

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liability in connection with this work, however arising shall be limited to the amount paid by you for this work, and that our employees or agents shall not under circumstances be liable to you in connection with this work

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-OES	based on MOE E3470, ICP-OES	20-Jan-16	20-Jan-16

Sample and QC Qualifiers Notes

1- GEN01 :Elevated Reporting Limits due to limited sample volume.

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Sample Results

Lead				Matrix: Paint
				Sample Date: 15-Jan-16
Parcel ID	Client ID	Units	MDL	Result
1604111-01	LS-01	ug/g	20	<33 [1]
1604111-02	LS-02	ug/g	20	286
1604111-03	LS-03	ug/g	20	<20

Laboratory Internal QA/QC

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Matrix Blank									
Lead	ND	20	ug/g						
Matrix Duplicate									
Lead	ND	20	ug/g	ND			0.0	30	
Matrix Spike									
Lead	237		ug/L	5.6	92.7	70-130			

APPENDIX 3

PHOTOS

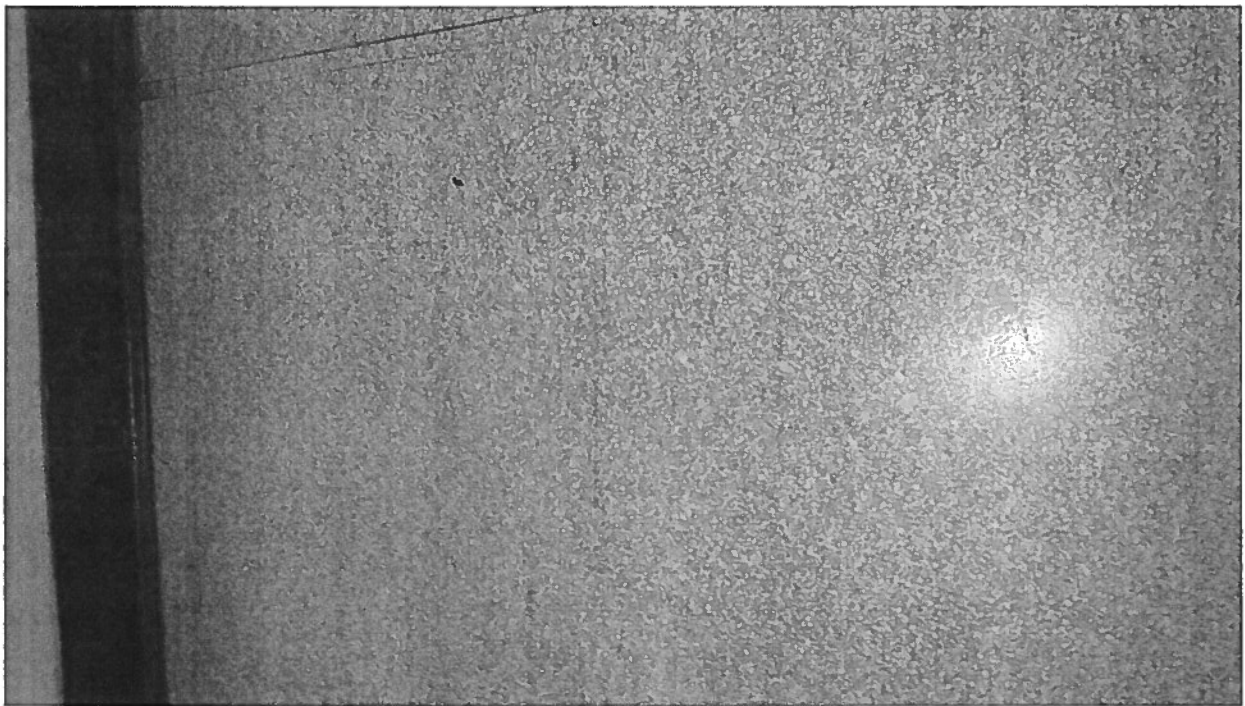


Photo 1 – ACM Sheet Vinyl Flooring with Stone Pattern and Paper Backing.

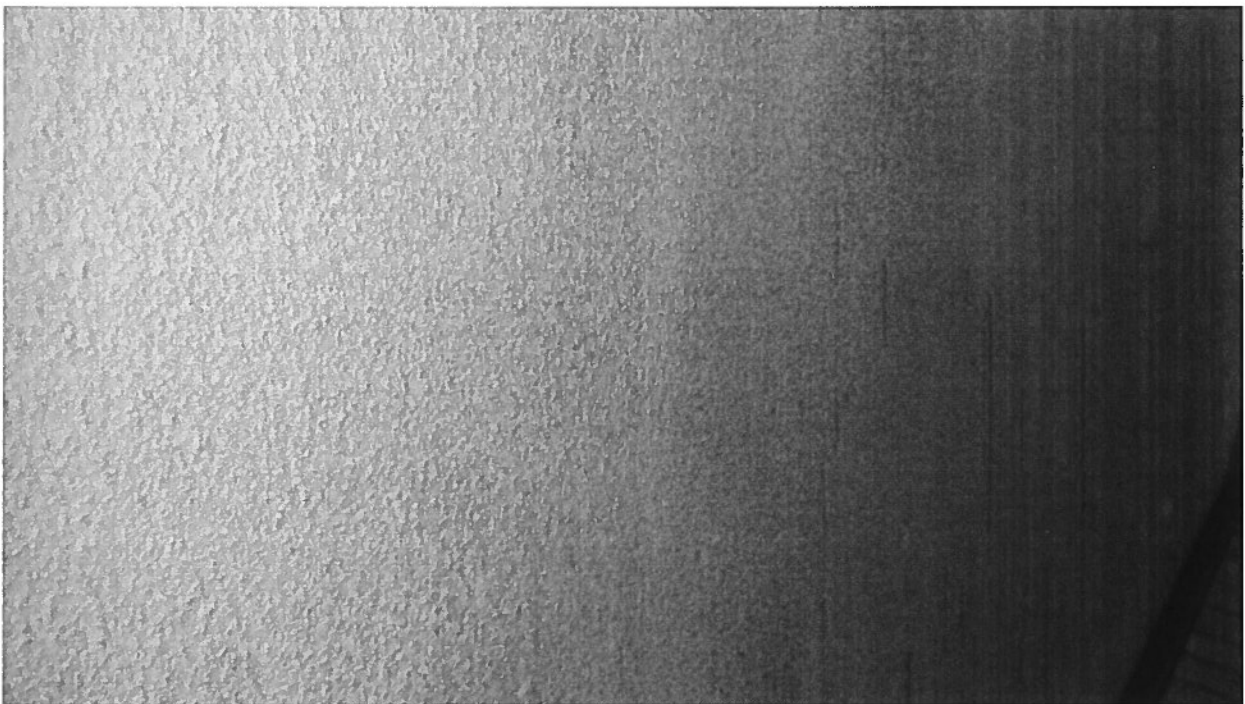


Photo 2 – ACM Textured Ceiling Finish

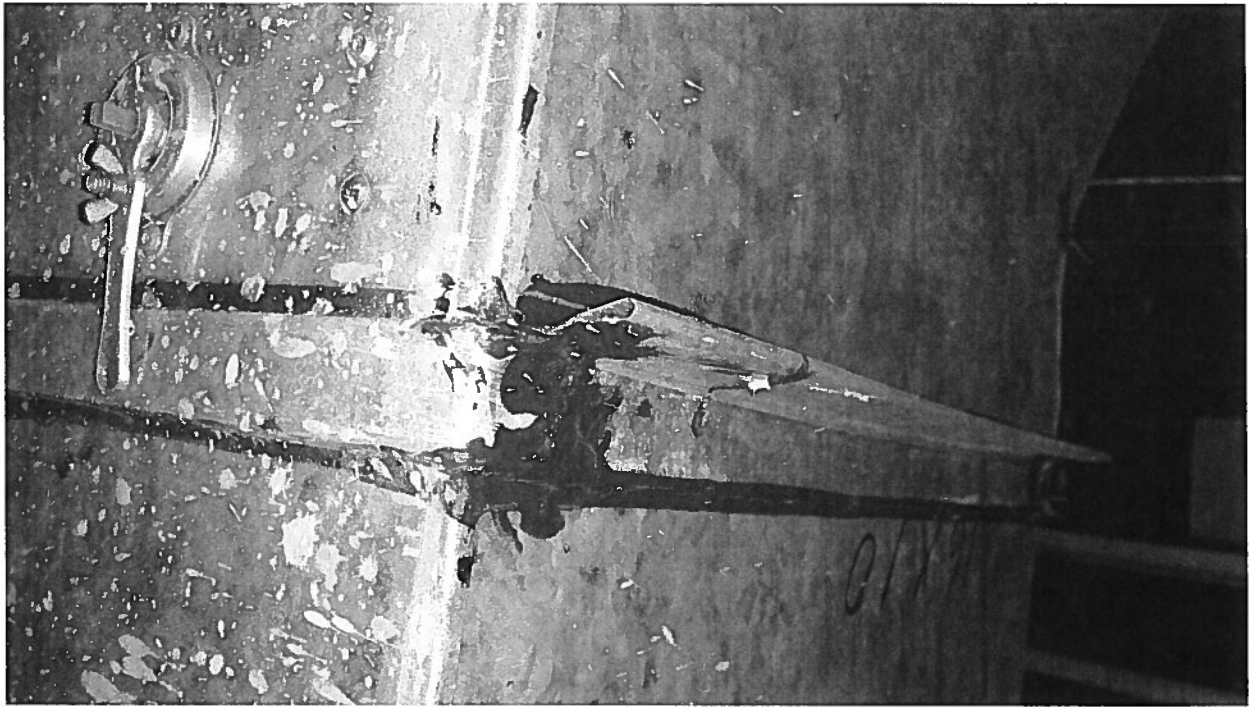


Photo 3 – Asbestos Containing Brown Duct Sealant

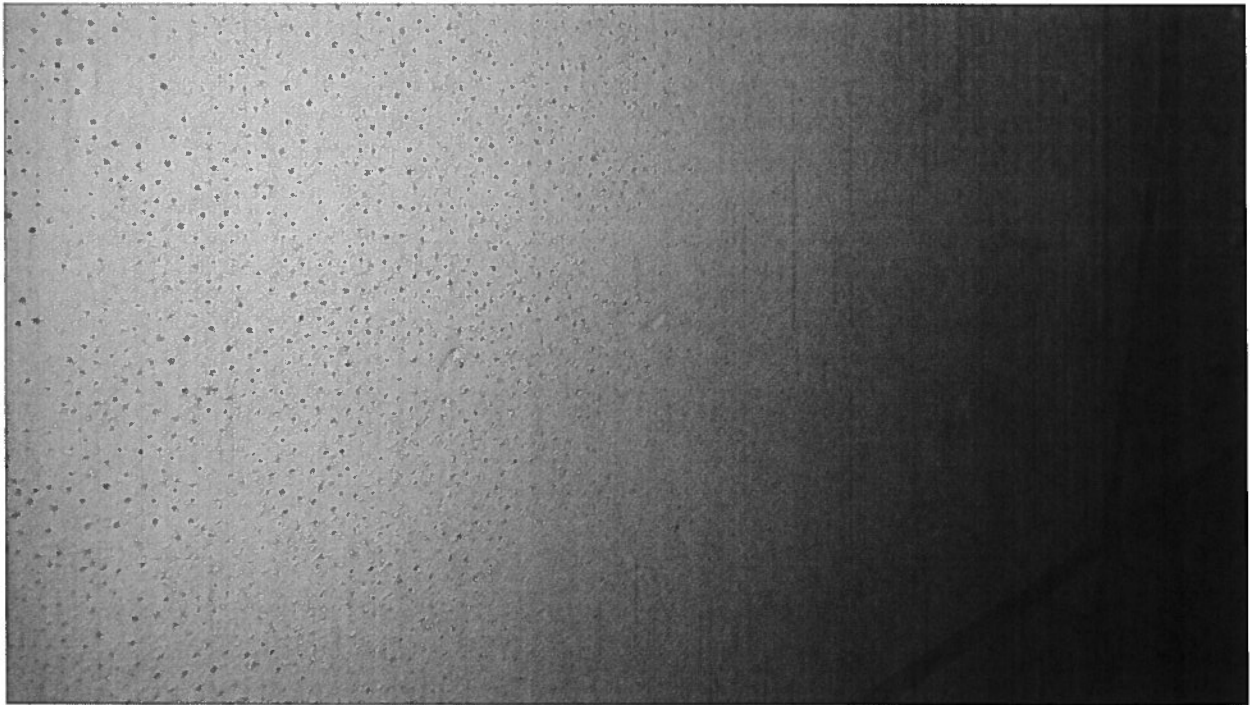


Photo 4 – Asbestos Containing Pink Back Acoustic Ceiling Tile

