

HAZARDOUS MATERIALS SURVEY AND 2023 REASSESSMENT ADVANCED RESEARCH COMPLEX (ARC), OTTAWA, ON



Project No.: Z2021101HZ / CCC-230252-00

Prepared for:

University of Ottawa

Prepared by:

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Date:

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REASSESSMENT SURVEY 2023

The University of Ottawa retained McIntosh Perry Limited (MPL) to complete a hazardous materials survey of the Advanced Research Complex (ARC) at 25 Templeton Street. The survey was conducted on June 8th, 2020.

The reassessment survey was completed on September 20, 2023.

The reassessment aimed to evaluate the condition and quantity of previously reported asbestos-containing materials (ACM) and develop corrective action plans as required for long-term management.

The assessment and reassessment determined the following findings and recommendations.

Summary of the Reassessment Findings:

- No ACMs were identified or suspected to be present in the building.
- No mould or water-damaged materials were observed during the site survey.

Summary of Recommendations:

- Perform a reassessment of asbestos materials on an annual basis.
- Perform a pre-construction assessment and remove all asbestos-containing materials (ACM) prior to alterations or maintenance work if ACM may be disturbed by the work.
- Follow appropriate safe work procedures when handling or disturbing asbestos.
- Sample any presumed ACM prior to alteration or maintained work if presumed ACM may be disturbed by the work.

EXECUTIVE SUMMARY

The University of Ottawa retained McIntosh Perry Limited (MPL) to complete a Hazardous Materials Survey at the Advanced Research Complex (ARC) at 25 Templeton Street. The survey was conducted on June 8th, 2020. **The reassessment survey was completed on September 20, 2023.**

The survey aimed to determine the presence of building materials containing Designated Substances and other hazardous materials, as defined under the Ontario Occupational Health and Safety Act. Designated Substances are eleven chemical agents prescribed under Ontario Regulation 490/09. In addition, a visual assessment was conducted for the presence of polychlorinated biphenyls (PCBs), radioactive materials, ozone-depleting substances (ODSs), other halocarbons and mould.

Based on the assessment conducted by MPL, no asbestos-containing materials (ACMs) were identified or suspected to be present in the building.

Based on the assessment conducted by MPL, the following Designated Substances and Hazardous Materials were identified or suspected to be present in the building:

Table A: Summary of Designated Substances & Hazardous Materials Identified

Material Description	Location
Mercury Vapour	Specific Equipment
UST/AST	Specific Areas Only
Lead Paint	Throughout Building
Lead Acid Batteries	Specific Equipment
Silica	Throughout Building

Note: Please refer to the complete report for specific details and recommendations.

Designated Substances are regulated under Ontario Regulation 490/09 — Designated Substances, made under the Ontario Health and Safety Act, which applies to controlling designated substances in the workplace.

In addition to Ontario Regulation 490/09, the following guidelines must also be adhered to when conducting work activities that involve disturbance of the above-mentioned materials:

- Guideline: Lead on Construction Projects, issued April 2011 by the Occupational Health and Safety branch of the Ministry of Labour
- Guideline: Silica on Construction Projects issued April 2011 by the Occupational Health and Safety branch of the Ministry of Labour.

Prior to any renovations or demolition activities within the building, designated substances and hazardous materials must be decommissioned by a licensed contractor such that they are contained and not released

to the environment during decommissioning as per O. Reg. 347/09- made under the Environmental Protection Act.

Any suspect building materials encountered that were not assessed as part of this survey should be assumed to contain designated substances until proven otherwise by analytical testing.

This report should be available to contractors tendering on renovation or demolition work. In turn, all contractors requesting tenders shall furnish this report to subcontractors.

This executive summary is not to be used alone. This report should be reviewed in its entirety.

November 28, 2022

University of Ottawa
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via email: martine.bergeron@uottawa.ca

Attention: Martine Bergeron, Senior Specialist, Occupational Health and Safety

Re: 25 Templeton Street – Advanced Research Complex (ARC)
Hazardous Materials Survey and 2023 Reassessment
McIntosh Perry Limited Reference No. Z2021101HZ / CCC-230252-00

1.0 INTRODUCTION

Under your instructions, McIntosh Perry Limited (MPL) conducted a Hazardous Materials Survey at 25 Templeton Street in Ottawa, ON. The site is on the northeast corner of King Edward Avenue and Templeton St. The building survey was conducted on June 8th, 2020. **The reassessment survey was completed on July 13th, 2022.**

The survey aimed to determine the presence of building materials containing Designated Substances and other hazardous materials, as defined under the Ontario Occupational Health and Safety Act. Designated Substances are eleven chemical agents prescribed under Ontario Regulation 490/09. In addition, a visual assessment was conducted for the presence of polychlorinated biphenyls (PCBs), radioactive materials, ozone-depleting substances (ODSs), other halocarbons and mould.

MPL completed the following,

- Visual review of the building to identify materials which could contain Designated Substances and hazardous materials;
- Bulk sampling and analysis of building materials suspected of containing asbestos (if required);
- Bulk sampling and analysis of representative paints and finishes suspected of containing lead (if required);
- Review of previously completed Hazardous Materials Survey(s) and historical building record(s); and,
- Recommendations for appropriate action where required.

2.0 PROPERTY DESCRIPTION

The subject building is a five-storey building constructed in 2014 and covers approximately 161,000 square feet. The subject building was observed to be built with a concrete slab floor flat conventional roof supported by steel trusses, beams and columns. The interior walls consist of gypsum wallboard, concrete block and concrete. Within the subject building, ceilings were observed to be suspended ceiling tiles, while open ceilings were observed in other areas of the building. The floors were generally concrete, vinyl sheet floor, vinyl floor tiles and carpet.

3.0 FINDINGS & RECOMMENDATIONS

Designated Substances

3.1 Asbestos

Findings

Due to the age of the subject building, no asbestos was suspected to be present and therefore, no samples were collected during the site investigation.

The following building materials (if present) were investigated for asbestos content:

3.1.1 Fireproofing

No fireproofing was observed in the subject building.

3.1.2 Mechanical Pipe Insulation

3.1.2.1 Mechanical Pipe Straight Insulation

Mechanical pipe straight insulation was observed throughout the subject building. MPL made several incisions throughout to investigate its composition, and it was visually identified as fibreglass and, therefore, not suspected of containing asbestos.

3.1.2.2 Mechanical Piping Elbows/Fittings Insulation

Mechanical pipe elbows/fittings insulation was observed throughout the subject building. MPL made several incisions throughout to investigate its composition, and it was visually identified as fibreglass and, therefore, not suspected of containing asbestos.

3.1.2.3 Mechanical Piping Hangers Insulation

Mechanical pipe hanger insulation was observed throughout the subject building. MPL made several incisions throughout to investigate its composition, and it was visually identified as fibreglass and, therefore, not suspected of containing asbestos.

3.1.2.4 HVAC Duct Insulation

No HVAC duct insulation was observed in the subject building.

3.1.3 Flexible Duct Connector

No flexible duct connectors were observed in the subject building.

3.1.4 Heat Shield or Heat Shield Insulation

No potential asbestos-containing heat shield insulation was observed in the subject building.

3.1.5 Texture Finishes

No texture finishes were observed in the subject building.

3.1.6 Plaster

No plaster finishes were observed in the subject building.

3.1.7 Drywall Joint Compound

No drywall finishes were sampled for asbestos content in the subject building.

3.1.8 Ceiling Tiles

No ceiling tiles were observed in the subject building.

3.1.9 Vinyl Floor Tiles

No vinyl floor tiles were observed in the subject building.

3.1.10 Vinyl Sheet Flooring

No vinyl sheet flooring was observed in the subject building.

3.1.11 Brick/Stone Mortar

No brick/stone mortar was observed in the subject building.

3.1.12 Concrete Block Mortar

No concrete block mortar was observed in the subject building.

3.1.13 Ceramic Wall / Floor Tile Grout

No bulk samples of the ceramic wall/floor tile grout were collected to avoid damage and compromise the structure's integrity. Prior to renovation/demolition, the ceramic wall/floor tile grout should be examined and tested for asbestos content. Ceramic wall/floor tile grout should, therefore, be considered to contain asbestos until bulk samples and analysis prove otherwise.

3.1.14 Transite (Asbestos Cement)

To avoid damage and compromise the structure's integrity, no bulk samples of the transit laboratory benchtops were collected. Prior to renovation/demolition, transite benchtops should be examined and tested for asbestos content. Transit should, therefore, be considered to contain asbestos until bulk samples and analysis prove otherwise.

3.1.15 Caulking

No caulking material was observed in the subject building.

3.1.16 Mastic

No mastics were observed in the subject building.

3.1.17 Cementitious Coating

No cementitious coating finishes were observed in the subject building.

3.1.18 Fire Doors

No fire doors were observed in the subject building.

3.1.19 Roofing Material

To avoid damage and compromising the integrity of the roofing material, no bulk samples of the roofing materials were collected. Prior to removal and/or replacement, roofing materials should be examined and tested for asbestos content. Roofing materials should be considered to contain asbestos until bulk samples and analysis prove otherwise.

Recommendations

- Prior to renovation/demolition of materials which are assumed to be ACM (suspect materials which were not sampled, i.e., ceramic wall/floor tile grout, roofing materials, and fire doors), these materials must either be tested for asbestos content or removed following appropriate asbestos abatement work procedures (Type 1/2/3) as detailed in O. Reg. 278/05 and disposed of as asbestos waste under O. Reg. 347;
- All repairs or removal of ACM must be conducted according to Ontario Regulation 278/05, Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act. Asbestos-containing waste must also be handled and disposed of according to Ontario Regulation 347/90 as amended – made under the Environmental Protection Act. Any suspect building materials encountered that were not assessed as part of this survey should be assumed to contain asbestos until proven otherwise by analytical testing;
- Sub-trades working with or close to ACM should be informed of its presence and

- Given that ACMs have been identified and will likely remain in place, an Asbestos Management Plan is required, and an inventory of ACMs must be kept on site. All ACMs must be routinely inspected to ensure no damage has occurred, and the inventory must be updated once every 12 months and as required based on expected changing site conditions, abatement and/or renovation activities.

Recommendations

Any suspect building materials encountered that were not assessed as part of this survey should be assumed to contain asbestos until proven otherwise by analytical testing.

3.2 Lead

Findings

3.2.1 Paint Finishes

A total of two (2) paint samples from the subject building were previously collected and analyzed for lead content. Results of bulk sampling testing are summarized in Table 2; the laboratory certificate of analysis can be found in Appendix C.

Table 2:
Previously Identified Lead Paint Finishes

Sample I.D.	Location	Material	Colour	Lead Concentration Weight by Conc. (%)
Pb-01	Room 532	Wall Paint	White	<0.015
Pb-02	Room 532	Floor Paint	Grey	0.012

The paint finish highlighted in blue in the above table was determined to contain low lead concentrations, less than or equal to 0.1%. This paint finish was observed to be in good condition.

The remaining paint finish in the above table was determined to contain concentrations of lead below the limit of detection. However, all other paints throughout the subject building that are not mentioned in this report must be considered to be lead-containing unless sampling and analysis prove otherwise.

3.2.2 Battery Packs

Lead-containing acid battery packs were observed in Room 532C.

Lead may also be present in the following materials in the building:

- Solder used on copper domestic water lines;
- Solder used in bell fittings for cast iron pipes;
- Solder used in electrical equipment;
- Ceramic tile glaze; and

- Concrete and mortar products, etc.

Recommendations

Paints identified to contain lead that are in good condition and do not pose a risk to workers or occupants can be managed in place.

Detailed worker protection protocols are outlined in the OMOL Guideline “Lead on Construction Projects” dated April 2011. Generally, removing the lead-based paint using a chemical gel or paste or a power tool equipped with a HEPA filter is considered a Type 1 operation. Removing lead-based paint by scraping or sanding using non-powered hand tools is considered a Type 2 operation. Removing lead-based paint using abrasive blasting or power tools without a HEPA filter is considered a Type 3 operation and requires the most stringent worker protection protocols (similar to asbestos). Furthermore, high-temperature cutting or welding would also require Type 3 Operations under the Guideline for Lead on Construction Projects. If this type of work is required, it may be prudent to chemically remove the lead paint in selected locations prior to performing any high-temperature cutting or welding.

All removed lead materials must follow the Ministry of Labour and Environmental Abatement Council of Ontario Lead Guidelines.

Please refer to Appendix E – Hazardous Materials Checklist for material conditions, quantities (where applicable), and recommended actions.

Precautions should be taken as required during major renovations and demolition projects to ensure that workers’ exposure to airborne lead does not exceed 0.05 mg/m³. This can be achieved by:

- providing workers with proper training;
- providing the workers with respiratory protection;
- wetting the surface of the materials to prevent dust emissions; and,
- providing workers with hygiene facilities to properly wash prior to exiting the work area.

Sub-trades working with or close to lead-based paint should be informed of its presence.

All waste material must be handled and disposed of according to the Revised Regulation of Ontario 347/90 as amended – made under the Environmental Protection Act. Lead waste generated may also be subject to this regulation’s Leachate Criteria (Schedule 4).

3.3 Mercury

Findings

3.3.1 Thermostat Switches

No thermostats containing liquid mercury were observed within the subject building.

3.3.2 Fluorescent Light Tubes

Fluorescent light fixtures containing 2 to 4 fluorescent light tubes per fixture were observed throughout the building. Mercury is likely to be present in vapour form in fluorescent light tubes.

3.3.3 Pressure Gauges and Float Switches

No pressure gauges or float switches suspected of containing mercury were noted in the subject building.

Recommendations

Please refer to Appendix E –Hazardous Materials Checklist for equipment conditions, quantities (where applicable), and recommended actions.

Precautions must be taken to prevent mercury liquid/vapours from becoming airborne during building demolition. Mercury exposure is regulated under Ontario Regulation 490/09, Designated Substances - made under the Occupational Health and Safety Act.” Prior to renovations to the building, all mercury-containing fluorescent light tubes, thermostats, and equipment must be removed and stored in a safe, secure location and/or properly disposed of under R.R.O. 1990, Regulation 347 General – Waste Management, made under the Environmental Protection Act.

3.4 Silica

Findings

Silica is expected to be present in building materials such as concrete, brick, mortar and ceramic tiles throughout the structures. Free crystalline silica (α -Quartz) may be a component in ceiling tiles and gypsum board. Silica (including free crystalline silica) may also be a component of concrete and brick surfaces noted in the building.

Recommendations

Please refer to Appendix E – Hazardous Materials Checklist for equipment conditions, quantities (where applicable), and recommended actions.

Precautions should be taken as required during major renovations and demolition projects on concrete (i.e. coring through concrete slabs, masonry demolition, etc.) to ensure that workers’ exposure levels to airborne silica do not exceed 0.05 mg/m^3 .

This can be achieved by:

- providing workers with proper training;
- providing the workers with respiratory protection;
- wetting the surface of the materials to prevent dust emissions; and,
- providing workers with facilities to properly wash prior to exiting the work area.

Any demolition work likely to impact silica-containing materials should be carried out per the requirement detailed in the Ontario Ministry of Labour document entitled “Guideline: Silica on Construction Projects,” dated April 2011.

Other Hazardous Materials

3.5 Polychlorinated Biphenyls (PCBs)

Findings

3.5.1 Light Ballasts

LED and fluorescent lights illuminate the subject building. Based on the age of the building, the lamp ballasts are not suspected to contain PCBs.

3.5.2 HID Light Ballasts

MPL observed HID lamps in the interior of the building. Based on the age of the building, the HID lamp ballasts are not suspected to contain PCBs.

3.5.3 Transformers

MPL did not observe any PCBs containing electrical transformers within the subject building.

Recommendations

Since no PCB-containing materials were observed or suspected to be present during the site survey, no further action is required.

3.6 Ozone Depleting Substances (ODSs) and Other Halocarbon

Findings

A visual assessment was conducted for equipment potentially containing ODSs and other halocarbons. MPL observed equipment such as refrigerators, water fountains, water coolers, freezers, etc., which contain or are suspected of containing ODSs or other halocarbons.

No other equipment containing ODSs, or other halocarbons was observed in the subject building.

Recommendations

Please refer to Appendix F – Hazardous Materials Checklist for equipment conditions, quantities (where applicable), and recommended actions.

Under the management of a licensed contractor, equipment containing R-404 and R-134a does not represent a significant threat to human health or the environment; however, a licensed contractor must decommission equipment such that CFCs are contained and not released to the environment during servicing or operation.

3.7 Radioactive Materials

Findings

A visual assessment of the subject building was conducted to determine if any electrical components containing radioactive materials were present. MPL did not observe any electrical components containing radioactive materials.

Recommendations

No further action is required since no radioactive materials were observed or suspected to be present during the site survey.

3.8 Underground and Above Ground Storage Tanks (USTs and ASTs)

Findings

A visual survey of the subject building was conducted to determine if any USTs and ASTs were present. MPL identified a diesel tank in Room 153B.

Recommendations

Please refer to Appendix F – Hazardous Materials Checklist for equipment conditions, quantities (where applicable), and recommended actions.

Prior to any demolition in the buildings, all USTs and ASTs equipment must be decommissioned by a licensed contractor such that substances are contained and not released into the environment during decommissioning.

3.9 Mould

Findings

3.9.1 Mould

A visual survey of the subject building was conducted to determine if any mould was present. No mould growth was observed in any areas.

3.9.2 Water Damage

A visual survey of the subject building was conducted to determine if water damage was present. No areas of water damage were observed.

Recommendations

Since no mould or water-damaged materials were observed or suspected to be present during the site survey, no further action is required.

This report should be available to contractors tendering on renovation or demolition work. In turn, all contractors requesting tenders shall furnish this report to subcontractors.

4.0 GENERAL CONSIDERATIONS AND LIMITATIONS

The information presented in this report is based on information provided by others, direct visual observation made by personnel with **McIntosh Perry Limited (MPL)**, and results of laboratory testing as identified herein.

It should be noted that there might be Designated Substances in locations not visible during our investigation. In the event such material is encountered during demolition operations in the building, this material should be tested and dealt with accordingly.

The findings detailed in this report are based upon the information available at the time of preparation of the report. No investigative method eliminates the possibility of obtaining imprecise or incomplete information. Professional judgement was exercised in gathering and analyzing the information obtained and in the formulation of our conclusions and recommendations.

MPL does not certify or warrant the environmental status of the property nor the building on the property.

Please note that the passage of time affects the information provided in the report. Environmental conditions of a site can change. Opinions relating to the site conditions are based upon information that existed at the time that the conclusions were formulated.

The client expressly agrees that it has entered into this agreement with MPL, both on its own behalf and as agent on behalf of its employees and principals.

The client expressly agrees that MPL's employees and principals shall have no personal liability to the client in respect of a claim, whether in contract, tort and/or any other cause of action in law. Accordingly, the client expressly agrees that it will bring no proceedings and take no action in any court of law against any of MPL's employees or principals in their capacity.

We trust that we have detailed our findings clearly and that we have satisfactorily addressed the scope of work you require at this time. In the event you wish us to review our findings with you, or require our services further in this regard, please do not hesitate to contact our office.

Yours truly,

MCINTOSH PERRY LIMITED



Jane Zhang, M.Sc.
Hazardous Materials, EH&S Technician
Hazardous Materials/ Environmental Health & Safety



John Tufts, B.Sc.
Project Manager
Hazardous Materials/ Environmental Health & Safety

APPENDIX A

Regulatory Requirements

REGULATORY REQUIREMENTS

In Ontario, there is a total of eleven Designated Substances. These substances have been regulated under Ontario Regulation 490/09 — *Designated Substances*, made under the Ontario Health and Safety Act, which applies to controlling designated substances in the workplace.

In addition to the Ontario Regulation 490/09 noted above, the following were observed for this survey:

Guideline: Lead on Construction Projects, issued in April 2011 by the Occupational Health and Safety branch of the Ministry of Labour

Guideline: Silica on Construction Projects issued in April 2011 by the Occupational Health and Safety branch of the Ministry of Labour.

The Occupational Health and Safety Act (OHSA), R.S.O. 1990, c.0.1, s.30 (1) specifies that: “Before beginning a project, the owner shall determine whether any Designated Substances are present at the project site and shall prepare a list of all Designated Substances that are present at the site.

Section 30 of The Act requires that the list of Designated Substances be provided to prospective contractors and subcontractors who may do work on a site and come into contact at the site with Designated Substances.

The Ministry of Labour has designated the following substances:

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

Ontario Regulation 278/05 (O. Reg. 278/05), the Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations, made under the Occupational Health and Safety Act (OHSA), requires owners of a building to identify Asbestos-containing Materials (ACMs) prior to potential disturbance of the materials.

In addition, an owner of a building is required to have an Asbestos Management Plan if ACMs (friable or non-friable) are present in the building and are to remain in place. An inventory of ACMs must be kept on site. All ACMs must be routinely inspected to ensure no damage has occurred, and the inventory must be updated once every 12 months and as may be required based on expected changing site conditions, abatement and/or renovation activities. Removal of all asbestos-containing materials is required prior to building demolition.

In addition to the Designated Substances, the building was also surveyed for other hazardous materials such as polychlorinated biphenyls (PCBs), radioactive materials, ozone-depleting substances (ODSs), other halocarbons, and mould.

We understand that this survey has been conducted to comply with the regulatory requirements of Ontario Regulation 278/05.

APPENDIX B

Survey Methodology & Background Information

SURVEY METHODOLOGY

Not all Designated Substances or suspect hazardous materials were previously sampled for this survey. Selective sampling was conducted only for substances suspected to be present or those deemed to have a likely source of origin in the survey areas.

Materials that were homogeneous and/or similar in appearance to other materials tested were considered to be of similar composition. The likelihood of ACMs being present in inaccessible areas, such as above gypsum board ceilings or behind gypsum wallboards, was determined by assessing the asbestos-containing systems in adjacent areas. Equipment such as boilers, motors, blowers, electrical panels, fire doors, etc., were not de-energized or disassembled to examine internal components or materials. These items should be considered to contain Designated Substances until proven otherwise.

During the survey, representative samples of suspect building materials were previously collected and sent to a CALA-accredited independent laboratory for analysis. The Laboratory Certificates of Analysis are attached in Appendix C.

Other Designated Substances were identified by visual observation and/or by reviewing Material Safety Data Sheets (MSDS) and/or safety labels where available.

Investigated Areas

The survey included all accessible areas and ceiling space throughout the Advanced Research Complex (ARC) as required under our scope of work. No destructive investigations were performed as part of this survey. Photographs of the areas investigated can be found in Appendix D.

The assessment was directed at the interior structure and finishes of the building. It did not consider current or past owner or occupant articles throughout the building (i.e. contents, furniture, etc.) and did not report on possible contaminants in the soil under and surrounding the building or contents of vessels, drums, etc., that may be concealed.

Sampling and Assessment Methodologies

Sampling was conducted as part of this assessment. Results for lead samples can be found in the Findings & Recommendation Section 3.0.

A historical review of previously designated substance survey reports and abatement reports was examined as part of this survey. The reports are listed as follows,

- Project-Specific Hazardous Materials Survey, ARC 444B & 444C, prepared by McIntosh Perry Limited (dated September 27, 2019, reference # 0Z1920428HZ);
- Hazardous Materials Survey: Advanced Research Complex (ARC), Ottawa, ON, prepared by McIntosh Perry Limited (dated October 13, 2020, reference # Z2021101HZ);
- Hazardous Materials Survey and 2022 Reassessment: Advanced Research Complex (ARC), Ottawa, ON, prepared by McIntosh Perry Limited (dated November 28, 2022, reference # Z2021101HZ / CCC-230252-00).

Asbestos

Background Information on Asbestos

Asbestos is a generic name for a group of naturally occurring fibrous minerals. Asbestos was commonly used in building materials such as insulation, fireproofing and acoustic or decorative panels. Although there are many types of asbestos, Ontario's three primary forms of commercial importance are chrysotile, amosite and crocidolite.

An Asbestos-Containing Material (ACM) is defined by O. Reg. 278/05 as a material that contains 0.5% or more asbestos by dry weight. ACMs are placed into two general classes, "friable" and "non-friable" ACMs. Friable ACMs are those materials that, when dry, can be crumbled, pulverized and reduced to powder by hand pressure. Typical friable ACMs include acoustical or decorative texture coats, fireproofing and thermal insulation. Non-friable ACMs are much more durable as they are held together by a binder such as cement, vinyl or asphalt. Typical non-friable ACMs include floor tiles, fire blankets, roofing materials and cementitious products such as wallboards, pipes or siding.

It has been recognized that hazardous situations may exist in buildings where asbestos-containing materials are found. This is especially true where asbestos fibres may become airborne due to material aging, physical damage, water damage or air movement.

In contrast, there is little reason for concern if the asbestos is in good condition, has not been damaged and is not in a location where it is likely to be disturbed.

Asbestos Survey Methodology

The asbestos survey included identifying potential friable and non-friable asbestos-containing materials throughout the surveyed areas of the subject building.

The likelihood of ACMs being present in inaccessible areas, such as above gypsum wallboard ceilings and walls, was determined by assessing the asbestos-containing materials in adjacent areas.

Fiberglass insulation was not submitted for analysis as it can be identified visually as non-asbestos material.

Building materials suspected of containing asbestos were identified, and representative sampling and laboratory testing of these materials was conducted. The number of bulk material samples collected from a homogeneous area was under Table 1. O. Reg. 278/05 s. 3 (3) below. Building materials suspected of containing asbestos were previously collected using wetting techniques and hand-sampling tools.

Table 1 - O. Reg. 278/05 s. 3(3): Minimum Asbestos Bulk Material Sample Requirements

Item	Type of material	Size of area of homogeneous material	Minimum number of bulk material samples to be collected
1.	Surfacing material, including, without limitation, material that is applied to surfaces by spraying, troweling or, such	Less than 90 square metres	3
		90 or more square metres but less than 450 square metres	5

	as acoustical plaster on ceilings and fireproofing materials on structural members	450 or more square metres	7
2.	Thermal insulation, except as described in item 3	any size	3
3.	Thermal insulation patch	Less than 2 linear metres or 0.5 square metres	1
4.	Other material	Any size	3

Preliminary identification of the samples was made using polarized light microscopy (PLM), confirming the presence and type of asbestos made by dispersion staining optical microscopy. This analytical procedure follows the U.S. Environmental Protection Agency Test Method EPA/600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials, June 1993.

Evaluation of ACMs Based on Condition

In evaluating an ACM's condition, the following criteria were applied:

- **Good** – Material shows no signs of damage and/or is encapsulated. Asbestos-containing material could remain in place until eventual building demolition or major renovation.
- **Fair** – Material shows signs of minor damage (<5% damage) or near the end of useful life. This includes minor shrinking, cracking, delamination and/ or other damage. The material should be monitored closely and scheduled to be repaired, encapsulated or removed.
- **Poor** – Damage to any ACM material is greater than 5% and is highly recommended to be removed, repaired, or encapsulated.

Note: The above evaluation criteria were also applied to other Designated Substances where applicable. Please refer to the Hazardous Materials Checklist in Appendix E for further details.

Lead

Background Information on Lead

Lead was a common additive in exterior and hard-wearing paint applications. Lead was used to prolong the paint's shelf life and increase its flexibility and durability to wear and weather. Acute exposure to lead by inhalation or ingestion may cause headaches, fatigue, nausea, abdominal cramps and joint pain. Chronic exposures can cause reduced hemoglobin production and reduced lifespan. It has also been known to impact the body's central and peripheral nervous systems and brain function and has been linked to learning disabilities in children.

No regulatory limit in Ontario determines what lead concentration constitutes a "lead-containing material." On October 21, 2010, Health Canada, under the *Hazardous Products Act*, stated that the lead content in surface-coating materials, furniture, toys and other articles for children should not exceed 90 mg/kg (0.009%, 90 ppm). However, this is intended for importing or selling of products within Canada. Therefore, this is not to be misconstrued as a limit established to define a lead-containing material or a limitation with respect to lead on construction projects.

The Environmental Abatement Council of Canada (EACC) has also developed the "*Lead Guideline for Construction, Renovation, Maintenance or Repair*" dated October 2014, which discusses the classification,

handling, disturbance and removal of lead-containing materials. For this guideline, paints or surface coatings containing less than or equal to 0.1% lead by weight (1000 mg/kg or 1000 ppm) are considered low-level lead paints or surface coatings. Suppose these materials (and their respective surfaces) are disturbed non-aggressively and performed using adequate dust control procedures. In that case, worker protection from the inhalation of lead is not required.

Furthermore, paints or surface coatings containing greater than 0.1% lead by weight are considered lead-containing paints or surface coatings. If these materials (and their respective surfaces) are disturbed, appropriate lead abatement procedures must always be followed.

Exposure to lead-containing materials is regulated under Ontario Regulation 490/09, *Designated Substances* - made under the Occupational Health and Safety Act. Care must be taken to prevent lead-containing particles from becoming airborne during the disturbance of lead-containing surfaces (i.e., during renovation or demolition projects). All lead abatement work must follow procedures outlined in the Guideline Lead on Construction Projects, issued in September 2004 (amended in April 2011) by the Occupational Health and Safety branch of the Ministry of Labour (Type 1-3). Similarly, the lead abatement work procedures outlined in the EACC Lead Guideline for Construction, Renovation, Maintenance or Repair (October 2014) may also be implemented (Class 1-3).

Lead has been used in solder on copper plumbing fixtures, lead conduit pipes, lead-calcium battery plates, ammunition, and nuclear and X-ray shielding devices. However, these materials were not sampled during this investigation but were noted where applicable.

Representative bulk samples of paint and finishes suspected of containing lead were previously collected to verify lead content in paints. Bulk samples were scraped down to the building base structure, with all possible layers present, placed in sealed plastic bags labelled, and then submitted to an independent laboratory for analysis. Samples were treated with a dilute nitric acid sample digestion prior to filtration. The analysis utilized for lead detection in filtered samples was inductively coupled plasma optical emission spectrometry (ICP-OES).

Mercury

Background Information on Mercury

Mercury is known to cause human poisoning by inhaling vapours, ingesting contaminated materials, or absorbing it through skin absorption through direct contact with liquids.

Precautions must be taken to prevent mercury vapours from becoming airborne during renovations or building demolition. Exposure to airborne mercury is regulated under the Revised O. Reg. 490/09 as amended – Regulation respecting Mercury – made under the Occupational Health and Safety Act; and under O. Reg. 558, which amended O. Reg. 347/90 (General - Waste Management), mercury is classified as a Schedule 2(b) Hazardous Waste Chemical. Its hazardous waste number is U151.

Mercury is found in thermostats, temperature and pressure gauges, fluorescent lamps and batteries. Mercury in products can be released to the environment through breakage or disposal at the end of a useful life. Improper disposal of these mercury products poses a health and environmental risk to everyone. In addition, the disposal of mercury-containing products can create wastes that are often classified as hazardous. Wastes that leach mercury in concentrations exceeding Ontario Regulation 347/90 (General - Waste Management) limits are also considered hazardous.

The mercury in thermostat switches contains approximately 3-4 grams in a glass ampoule, typically attached to a metal coil. Mercury-containing switches have been used in thermostats for over 40 years.

Mercury is an essential component in fluorescent lamps and HID lamps. The mercury and the phosphor coating on the lamp tube are in a vapour form. Estimates of the mercury content contained in compact, 4-foot, and 8-foot lamps are 10 mg, 23 mg, and 46 mg, respectively.

Most fluorescent lamps qualify as hazardous waste when removed from service and are prohibited from disposal in the solid waste stream. Fluorescent lamps would be classified as 146T on your facility Generator Registration Report under O. Reg. 347/90 - General Waste Management, as amended by O. Reg. 558/00. Under this regulation, if the leachate results exceed 0.1 milligrams of mercury per litre for a given waste, the facility must treat the waste as hazardous. Most fluorescent and HID lamps will exceed the leachate toxicity limit; therefore, these wastes must be registered and treated as hazardous waste or sent for recycling.

Silica

Background Information on Silica

Silica is expected to be present in building materials such as concrete, brick, mortar and ceramic tiles throughout the structures. Free crystalline silica (α-Quartz) may be a component in ceiling tiles and gypsum boards. Silica (including free crystalline silica) may also be a component of concrete and brick surfaces noted in the building.

Exposure to airborne silica is regulated under Ontario Regulation 490/09, *Designated Substances* - made under the Occupational Health and Safety Act.

Polychlorinated Biphenyls (PCBs)

Background Information on PCBs

Polychlorinated Biphenyls (PCBs) were commonly used as dielectric insulating fluids in electrical equipment such as transformers and capacitors and in fluorescent and HID lamp ballasts. The production of PCBs in North America started in 1929 and was banned at the beginning of 1979. After 1981, no manufacturers produced fluorescent and HID lamps with PCB-containing ballasts.

PCBs are not a designated substance under the Occupational Health and Safety Act.

PCB Regulations (SOR/2008-273)

The *PCB Regulations* (the Regulations) set specific deadlines for ending the use of PCBs in concentrations at or above 50 mg/kg, eliminating all PCBs and equipment containing PCBs currently in storage and limiting the period PCBs can be stored before being destroyed. The Regulations also establish sound practices for the better management of the remaining PCBs in use (i.e. those with content of less than 50 mg/kg) until their eventual elimination to prevent contamination of dielectric fluids and dispersion of PCBs in small quantities into other liquids.

Ozone-depleting Substances (ODSs) and Other Halocarbons

Background Information on ODSs

Within Ontario, the general use of ozone-depleting substances (ODSs) and other halocarbons is controlled through Regulation 463/10 of the Environmental Protection Act. Production of ODSs in hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs) ceased in Canada in 1993 due to their ozone-depleting characteristics. The importation of CFCs into Canada ceased in 1997, and a total ban was placed on their use in 2010. The use of these materials is still permitted in existing equipment. Still, equipment must be serviced by a licensed contractor such that CFCs are contained and not released to the environment during servicing or operation.

Radioactive Materials

Two types of smoke detectors are common in buildings (residential, institutional, commercial, industrial, etc.). Photoelectric-type smoke detectors detect smoke using an optical sensor, whereas ionization-type smoke detectors use an ionization chamber containing radioactive material. The ionization type is cheaper and is particularly common in older buildings. A typical modern detector contains about 1.0 microcurie of the radioactive element americium, a decrease from 3 microcurie in 1978. Sealed radioactive material sources in fire detection systems are still permitted and regulated by the Canadian Nuclear Safety Commission (CNSC) and the Canadian Nuclear Safety Act. The radioactive sources in smoke alarms are sealed and contained within a metal case inside the smoke detector and must not be damaged or tampered with.

Mould & Water Damage

Mould growth inside buildings is due to excess moisture caused by leakages, condensation or capillary movement of water into the building. Toxic moulds such as *Stachybotrys chartarum* and some species of *Aspergillus* spp. are greenish-black, wet and slimy moulds that grow on soaking wet cellulose-based materials. They are often found near water leaks or where drying is very slow and can form after flooding if insufficient cleanup and drying occur. They will generally not occur if materials are kept dry.

MPL conducted a general visual assessment for any obvious signs of visible mould and/or water damage. Based on our visual observations, the following guidelines were used in providing our recommendations for remedial action where required:

- Institute of Inspection Cleaning and Restoration Certification (IICRC) S520 Standard and Reference for Professional Mould Remediation,
- The Canadian Construction Association (CCA) Mould Guidelines for the Canadian construction industry (CCA document 82-2004)
- Environmental Abatement Council of Canada (EACC) Mould Abatement Guidelines.

Other Designated Substances

Select Designated Substances (acrylonitrile, arsenic, coke oven emissions, ethylene oxide, isocyanates, benzene, or vinyl chloride) are not expected to be present in the building in matrix or sufficient quantities to cause an exceedance of Ministry of Labour exposure guidelines. As such, no sampling was conducted for these materials.

Vinyl Chloride

Vinyl chloride (monomer) is likely to be present in stable form within poly vinyl-chloride (PVC) piping and conduits and as a component of interior finishes. Such building materials are not considered to be hazardous in their current matrix/composition.

Acrylonitrile

Acrylonitrile or ACN (vinyl cyanide) is an explosive, flammable liquid used to manufacture acrylic fibres, rubber-like materials and pesticide fumigants. Acrylonitrile was not noted and would not be expected to be present in the project-specific area/surveyed area/subject building.

Arsenic

Arsenic is used in metallurgy for hardening copper, lead and alloys, pigment production, manufacturing of certain types of glass, insecticides, fungicides and rodenticides, as a by-product in the smelting of copper ores, and as a dopant material in semiconductor manufacturing. Arsenic or arsenic compounds were not noted nor expected to be present in the project-specific area/surveyed area/subject building.

Benzene

Benzene or benzol is a colourless liquid. It is used as an intermediate in producing styrene, phenol, cyclohexane, and other organic chemicals and to manufacture detergents, pesticides, solvents, and paint removers. It is also found in gasoline. Benzene may be present in stable form in roofing materials, paints and adhesives located throughout the subject building. Such building materials are not considered to be hazardous in their current matrix/composition.

Coke Oven Emissions

Coke oven emission is a benzene-soluble fraction of the total particulate matter of the substances emitted into the atmosphere from metallurgical coke ovens.

Ethylene Oxides

Ethylene oxide is a colourless gas liquefying below 12°C. It is used generally as a fumigant and sterilizing agent for medical equipment. It is used generally as a fumigant and sterilizing agent for medical equipment.

Isocyanates

Isocyanate compounds may be present in stable form in paint finishes, varnishes, polyurethane plastics, synthetic rubbers, foams and adhesives. Such building materials are not considered to be hazardous in their current matrix/composition.

To reduce the potential for exposure to workers or occupants, any suspect hazardous building material(s) not detailed within this survey due to inaccessibility and/or discovered during any renovation or demolition activities must be properly assessed and/or tested prior to their disturbance.

APPENDIX C

Laboratory Report



EMSL Canada Inc.

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<http://www.EMSL.com> / ottawalab@EMSL.com

EMSL Canada Order 672000956
Customer ID: 55CTCS25B
Customer PO: 0Z2-021101
Project ID: Ottawa DSS

Attn: Stefan Holik
McIntosh Perry Consulting Engineers Ltd
115 Walgreen Rd RR 3
Carp, ON K0A 1L0

Phone: (613) 836-2184
Fax:
Collected: 6/ 5/2020
Received: 6/19/2020
Analyzed: 6/26/2020

Proj: University of Ottawa 0Z2-021101 (ARC) (Ottawa DSS)

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

Client Sample ID: 1.1

Lab Sample ID: 672000956-0001

Sample Description: ARC/Spray insulation - Room 532

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Gray/Gold	35.0%	65.0%	None Detected	Sample contains vermiculite which is a problem matrix; TEM with milling recommended

Client Sample ID: 1.2

Lab Sample ID: 672000956-0002

Sample Description: ARC/Spray insulation - Room 532

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Gray/Gold	35.0%	65.0%	None Detected	Sample contains vermiculite which is a problem matrix; TEM with milling recommended

Client Sample ID: 1.3

Lab Sample ID: 672000956-0003

Sample Description: ARC/Spray insulation - Room 532

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Gray/Gold	35.0%	65.0%	None Detected	Sample contains vermiculite which is a problem matrix; TEM with milling recommended

Client Sample ID: 2.1

Lab Sample ID: 672000956-0004

Sample Description: ARC/DJC

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	White	0.0%	100.0%	None Detected	

Client Sample ID: 2.2

Lab Sample ID: 672000956-0005

Sample Description: ARC/DJC

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	White	0.0%	100.0%	None Detected	

Client Sample ID: 2.3

Lab Sample ID: 672000956-0006

Sample Description: ARC/DJC

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	White	0.0%	100.0%	None Detected	



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<http://www.EMSL.com> / ottawalab@EMSL.com

EMSL Canada Order 672000956
Customer ID: 55CTCS25B
Customer PO: 0Z2-021101
Project ID: Ottawa DSS

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

Client Sample ID: 2.4 **Lab Sample ID:** 672000956-0007
Sample Description: ARC/DJC

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	White	0.0%	100.0%	None Detected	

Client Sample ID: 2.5 **Lab Sample ID:** 672000956-0008
Sample Description: ARC/DJC

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	White	0.0%	100.0%	None Detected	

Client Sample ID: 2.6 **Lab Sample ID:** 672000956-0009
Sample Description: ARC/DJC

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	White	0.0%	100.0%	None Detected	

Client Sample ID: 2.7 **Lab Sample ID:** 672000956-0010
Sample Description: ARC/DJC

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	White	0.0%	100.0%	None Detected	

Client Sample ID: 3.1-Vinyl Floor Tile **Lab Sample ID:** 672000956-0011
Sample Description: ARC/VFT - light grey with grey streaks - Room 500K

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 3.1-Mastic **Lab Sample ID:** 672000956-0011A
Sample Description: ARC/VFT - light grey with grey streaks - Room 500K

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 3.2-Vinyl Floor Tile **Lab Sample ID:** 672000956-0012
Sample Description: ARC/VFT - light grey with grey streaks - Room 500K

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 3.2-Mastic **Lab Sample ID:** 672000956-0012A
Sample Description: ARC/VFT - light grey with grey streaks - Room 500K

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Yellow	0.0%	100.0%	None Detected	



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EMSL Canada Order 672000956
 Customer ID: 55CTCS25B
 Customer PO: 0ZZ-021101
 Project ID: Ottawa DSS

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

Client Sample ID: 3.3

Lab Sample ID: 672000956-0013

Sample Description: ARC/VFT - light grey with grey streaks - Room 500K

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 4.1

Lab Sample ID: 672000956-0014

Sample Description: ARC/Firestop caulking - Room 523

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Red	0.0%	100.0%	None Detected	

Client Sample ID: 4.2

Lab Sample ID: 672000956-0015

Sample Description: ARC/Firestop caulking - Room 523

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Red	0.0%	100.0%	None Detected	

Client Sample ID: 4.3

Lab Sample ID: 672000956-0016

Sample Description: ARC/Firestop caulking - Room 523

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Red	0.0%	100.0%	None Detected	

Client Sample ID: 5.1

Lab Sample ID: 672000956-0017

Sample Description: ARC/Spray fire insulation - 6th floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Gray/Gold	30.0%	70.0%	None Detected	Sample contains vermiculite which is a problem matrix; TEM with milling recommended

Client Sample ID: 5.2

Lab Sample ID: 672000956-0018

Sample Description: ARC/Spray fire insulation - 6th floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Gray/Gold	0.0%	100.0%	None Detected	Sample contains vermiculite which is a problem matrix; TEM with milling recommended

Client Sample ID: 5.3

Lab Sample ID: 672000956-0019

Sample Description: ARC/Spray fire insulation - 6th floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/26/2020	Gray/Gold	35.0%	65.0%	None Detected	Sample contains vermiculite which is a problem matrix; TEM with milling recommended



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EMSL Canada Order 672000956
Customer ID: 55CTCS25B
Customer PO: 0Z2-021101
Project ID: Ottawa DSS

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

Analyst(s):

Ewa Krupinska PLM (21)

Reviewed and approved by:

Simon Parent, Laboratory Manager
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 or the U.S. Government

Samples analyzed by EMSL Canada Inc. Ottawa, ON

Initial report from: 06/26/202016:01:33



EMSL Canada Inc.

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EMSL Canada Or 552007002
CustomerID: 55CTCS25B
CustomerPO: 0Z2-021101
ProjectID: Ottawa DSS

Attn: **Stefan Holik**
McIntosh Perry Consulting Engineers Ltd
115 Walgreen Rd RR 3
Carp, ON K0A 1L0

Phone: (613) 836-2184
Fax:
Received: 6/22/2020 11:21 AM
Collected:

Project: **University of Ottawa 0Z2-021101 "Ottawa DSS"**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

<i>Client SampleDescription</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>RDL</i>	<i>Lead Concentration</i>
PB1 552007002-0001		6/24/2020 Site: ARC- white wall - room 532 Insufficient sample to reach reporting limit.	0.1303 g	0.015 % wt	<0.015 % wt
PB2 552007002-0002		6/24/2020 Site: ARC - grey floor - room 532	0.2481 g	0.0081 % wt	0.012 % wt

Rowena Fanto, Lead Supervisor
or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. 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. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008% wt based on the minimum sample weight per our SOP. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request. Samples analyzed by EMSL Canada Inc. Mississauga, ON AIHA-LAP, LLC - ELLAP #196142

Initial report from 06/29/2020 07:46:36

APPENDIX D

Site Photographs



Photo 1: View of typical office finishes.



Photo 2: View of typical laboratory finishes.



Photo 3: View of typical hallway finishes.



Photo 4: Typical view of ODS containing water fountain



Photo 5: View of the lead-acid batteries present in Room 532C.

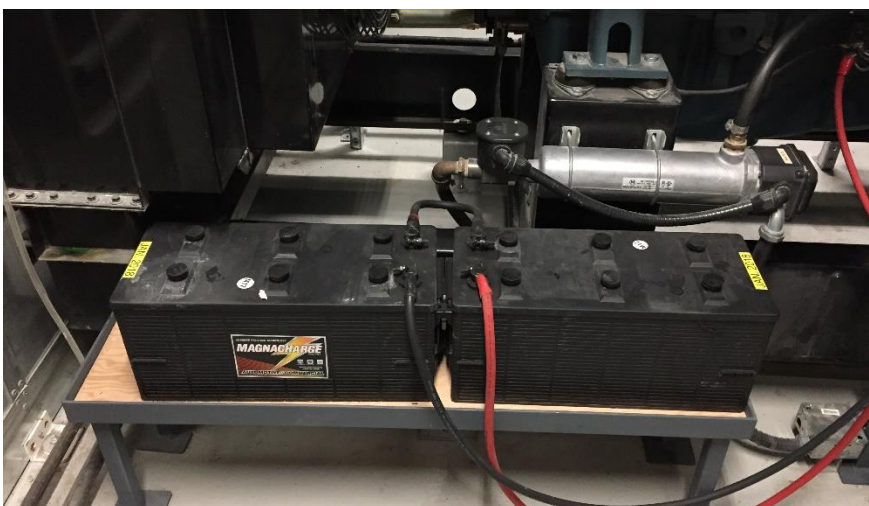


Photo 6: View of the lead-acid batteries present in Room 532C.



Photo 7: A typical view of fiberglass mechanical insulation was observed throughout the subject building.



Photo 8: A typical view of fiberglass mechanical insulation was observed throughout the subject building.



Photo 9: Representative view of the fluorescent light fixtures containing mercury vapour observed throughout the subject building.

APPENDIX E

Hazardous Materials Checklist

Advanced Research Complex (ARC), Ottawa, ON
Hazardous Materials Survey and 2023 Reassessment
Appendix E - Hazardous Materials Checklist

Z2021101HZ / CCC-230252-00

Floor/Level	Room	DS Type	Component	Colour	Condition	Manufacturer	Approx. Quantity	Unit	Suspected/ Confirmed	Recommended Action	Comments
1	Throughout Level	Mercury	Fluorescent Light Tubes	N/A	Good Condition	N/A	-	-	Confirmed	Manage in Place	
1	Throughout Level	Silica	Concrete, Mortar, Etc.	N/A	Good Condition	N/A	-	-	Confirmed	Manage in Place	
1	Room 151	Ozone Depleting Substances (ODS)	Air Conditioning Unit	N/A	Good Condition	Haskris	2	C	Confirmed	Manage in Place	R134a
1	Room 153B	USTs/ASTs	Diesel Tank	N/A	Good Condition	N/A	1	C	Confirmed	Manage in Place	
1	Throughout Level	Lead	Floor Paint	Grey	Good Condition	N/A	-	-	Confirmed	Manage in Place	
2	Throughout Level	Mercury	Fluorescent Light Tubes	N/A	Good Condition	N/A	-	-	Confirmed	Manage in Place	
2	Throughout Level	Silica	Concrete, Mortar, Etc.	N/A	Good Condition	N/A	-	-	Confirmed	Manage in Place	
2	Throughout Level	Lead	Floor Paint	Grey	Good Condition	N/A	-	-	Confirmed	Manage in Place	
3	Throughout Level	Mercury	Fluorescent Light Tubes	N/A	Good Condition	N/A	-	-	Confirmed	Manage in Place	
3	Throughout Level	Silica	Concrete, Mortar, Etc.	N/A	Good Condition	N/A	-	-	Confirmed	Manage in Place	
3	Room 300	Ozone Depleting Substances (ODS)	Water Fountain	N/A	Good Condition	Unknown	1	C	Confirmed	Manage in Place	R134a
3	Throughout Level	Lead	Floor Paint	Grey	Good Condition	N/A	-	-	Confirmed	Manage in Place	
4	Room 400	Ozone Depleting Substances (ODS)	Water Fountain	N/A	Good Condition	Unknown	1	C	Confirmed	Manage in Place	R134a
4	Throughout Level	Mercury	Fluorescent Light Tubes	N/A	Good Condition	N/A	-	-	Confirmed	Manage in Place	

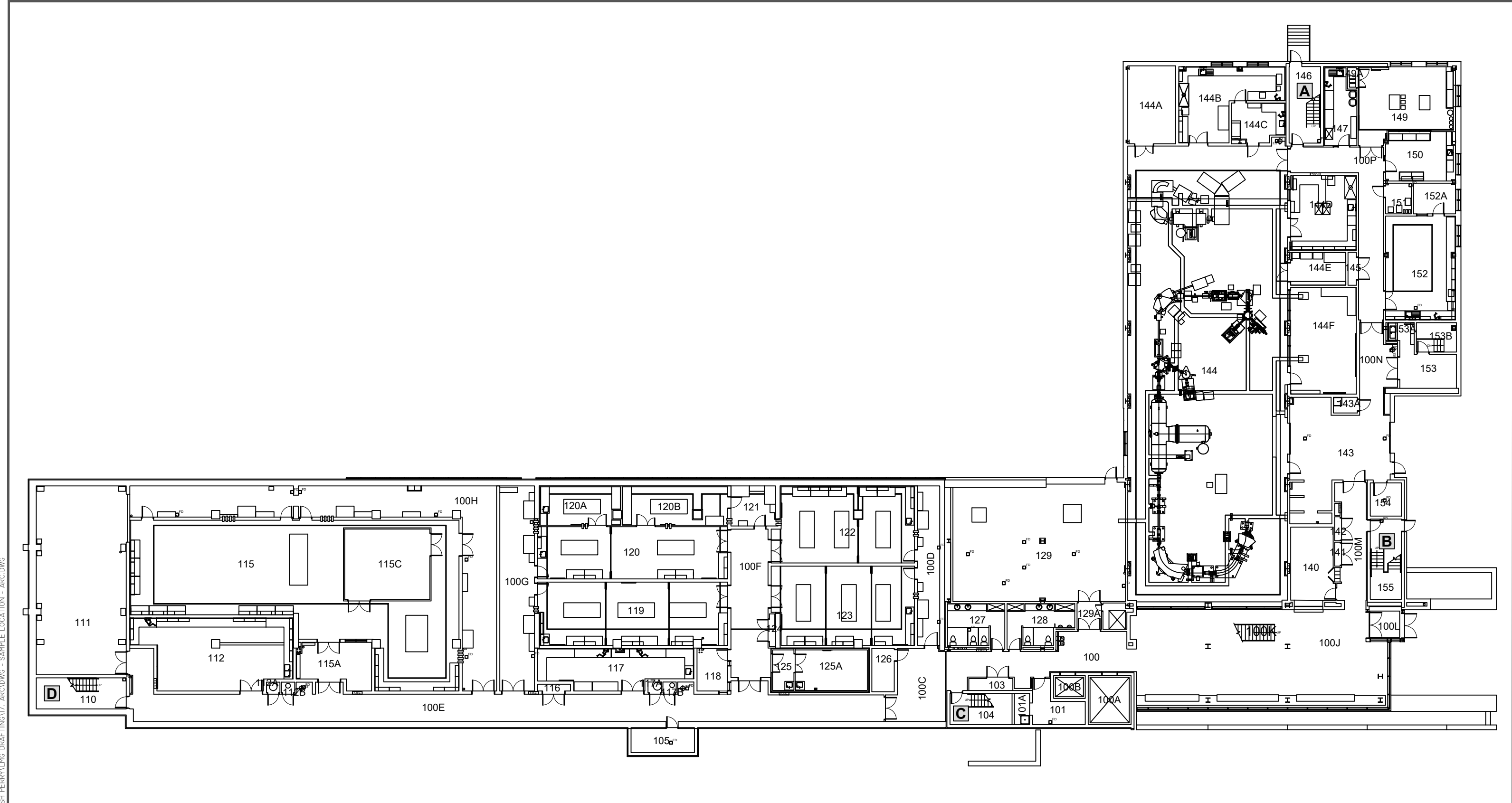
Advanced Research Complex (ARC), Ottawa, ON
Hazardous Materials Survey and 2023 Reassessment
Appendix E - Hazardous Materials Checklist

Z2021101HZ / CCC-230252-00

Floor/Level	Room	DS Type	Component	Colour	Condition	Manufacturer	Approx. Quantity	Unit	Suspected/ Confirmed	Recommended Action	Comments
4	Throughout Level	Silica	Concrete, Mortar, Etc.	N/A	Good Condition	N/A	-	-	Confirmed	Manage in Place	
4	Throughout Level	Lead	Floor Paint	Grey	Good Condition	N/A	-	-	Confirmed	Manage in Place	
5	Room 552C	Ozone Depleting Substances (ODS)	Refrigerator	N/A	Good Condition	Thermo Scientific & Fisher Scientific	3	C	Confirmed	Manage in Place	R134a & R404
5	Room 512	Ozone Depleting Substances (ODS)	Refrigerator	N/A	Good Condition	Danby	1	C	Confirmed	Manage in Place	R134a
5	Throughout Level	Lead	Floor Paint	Grey	Good Condition	N/A	-	-	Confirmed	Manage in Place	
5	Room 532	Lead	Battery Packs	N/A	Good Condition	N/A	4	C	Confirmed	Manage in Place	
5	Throughout Level	Mercury	Fluorescent Light Tubes	N/A	Good Condition	N/A	-	-	Confirmed	Manage in Place	
5	Throughout Level	Silica	Concrete, Mortar, Etc.	N/A	Good Condition	N/A	-	-	Confirmed	Manage in Place	
6	Throughout Level	Lead	Floor Paint	Grey	Good Condition	N/A	-	-	Confirmed	Manage in Place	
6	Throughout Level	Mercury	Fluorescent Light Tubes	N/A	Good Condition	N/A	-	-	Confirmed	Manage in Place	
6	Throughout Level	Silica	Concrete, Mortar, Etc.	N/A	Good Condition	N/A	-	-	Confirmed	Manage in Place	

APPENDIX F

Site Sampling & Locations Plan



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 6240 HIGHWAY 7 SUITE 200 WOODBRIDGE ON L4H 4G3
 Tel: 905.856.5200 Fax: 905.695.0221
 Toll Free: 1.888.348.8991 www.mcintoshperry.com

THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS.
 REPORT ALL ERRORS AND OMISSIONS TO THE CONSULTANTS, PRIOR
 TO PROCEEDING WITH ANY WORKS.

Legend:

- ▲ Asbestos Bulk Sample
- Lead Paint Sample <LOD
- Lead Paint Sample >LOD

CLIENT: UNIVERSITY OF OTTAWA

PROJECT: ADVANCED RESEARCH COMPLEX
 HAZARDOUS MATERIALS SURVEYS

TITLE: SAMPLE LOCATIONS
 LEVEL I

SCALE: 1:300 DATE: JULY 22, 2020

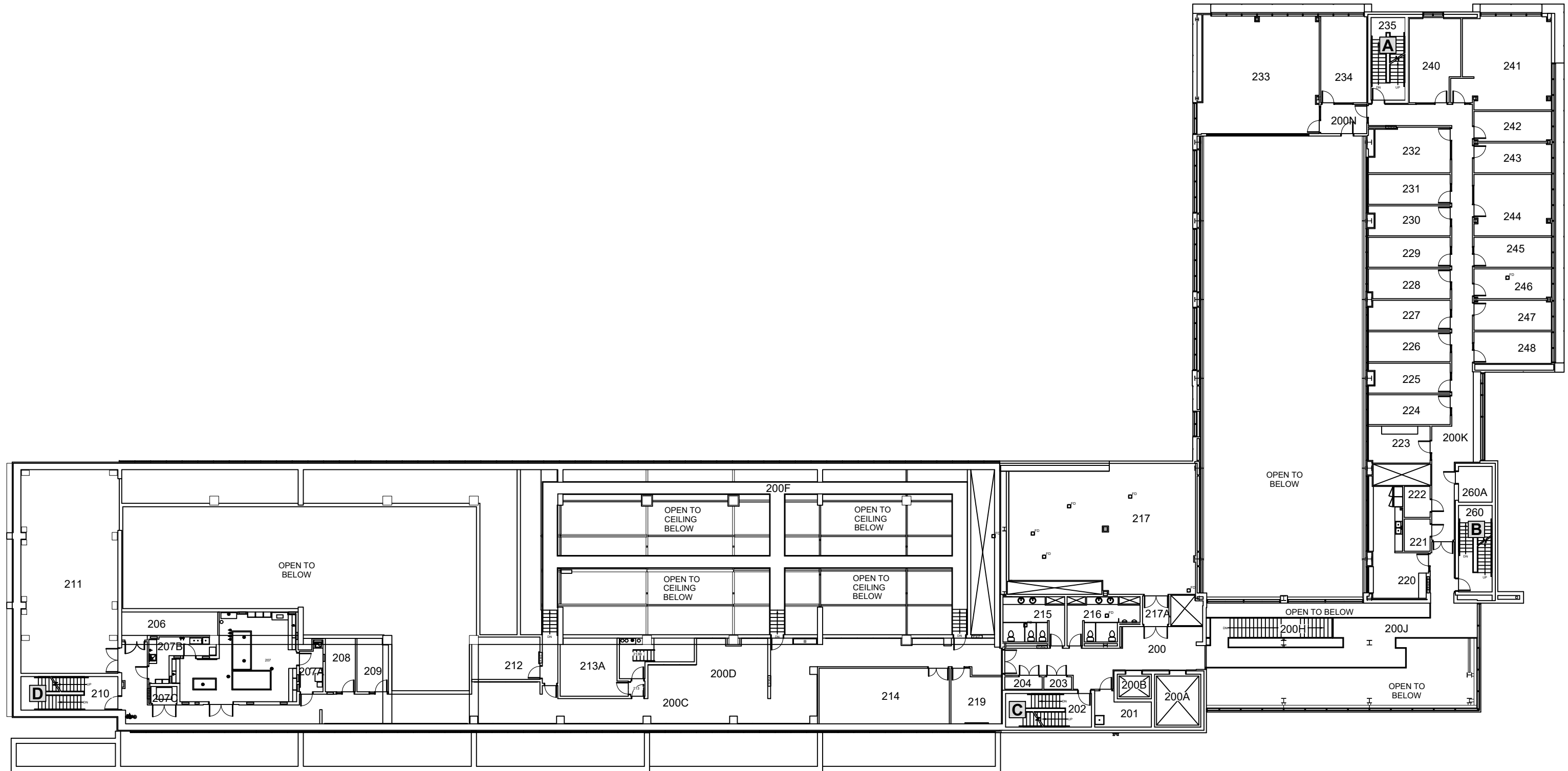
DRAWN: D.B CHECKED: M.M

REV. NO.	DESCRIPTION	DATE	BY	APPD.

DRAWING NUMBER: AI

C:\USERS\DIANAB\ONEDRIVE - MCINTOSH PERRY\LMG DRAFTING\17 - ARC.DWG - SAMPLE LOCATION - ARC.DWG

C:\USERS\DIANA\B\ONEDRIVE - MCINTOSH PERRY\LMG DRAFTING\17 - ARC.DWG - SAMPLE LOCATION - ARC.DWG



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CLIENT: UNIVERSITY OF OTTAWA

TITLE: SAMPLE LOCATIONS
 LEVEL 2

PROJECT: ADVANCED RESEARCH COMPLEX
 HAZARDOUS MATERIALS SURVEYS

SCALE: 1:300

DATE: JULY 22, 2020

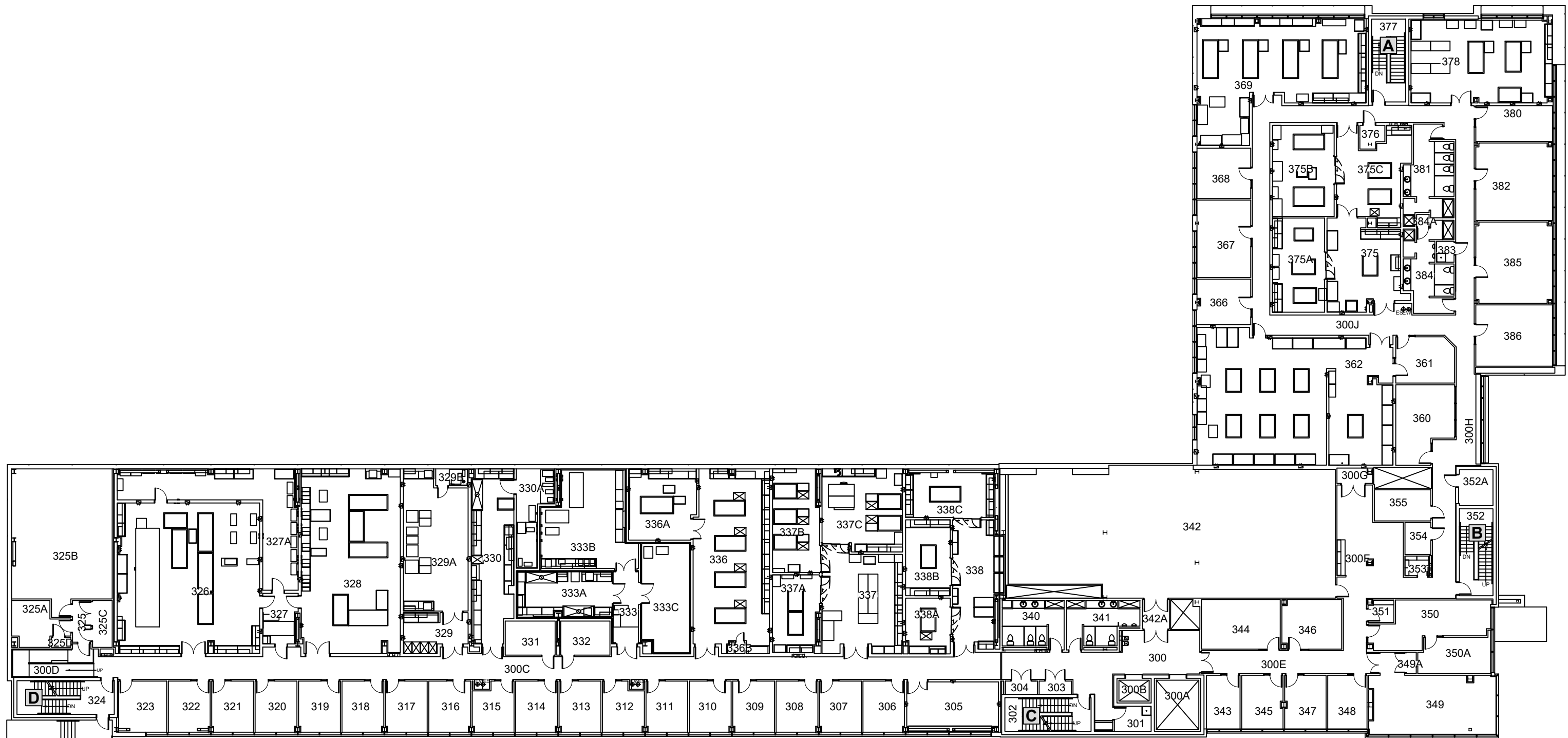
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CHECKED: M.M

REV. NO.	DESCRIPTION	DATE	BY	APPD.

DRAWING NUMBER: A2

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Legend:
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 ■ Lead Paint Sample >LOD

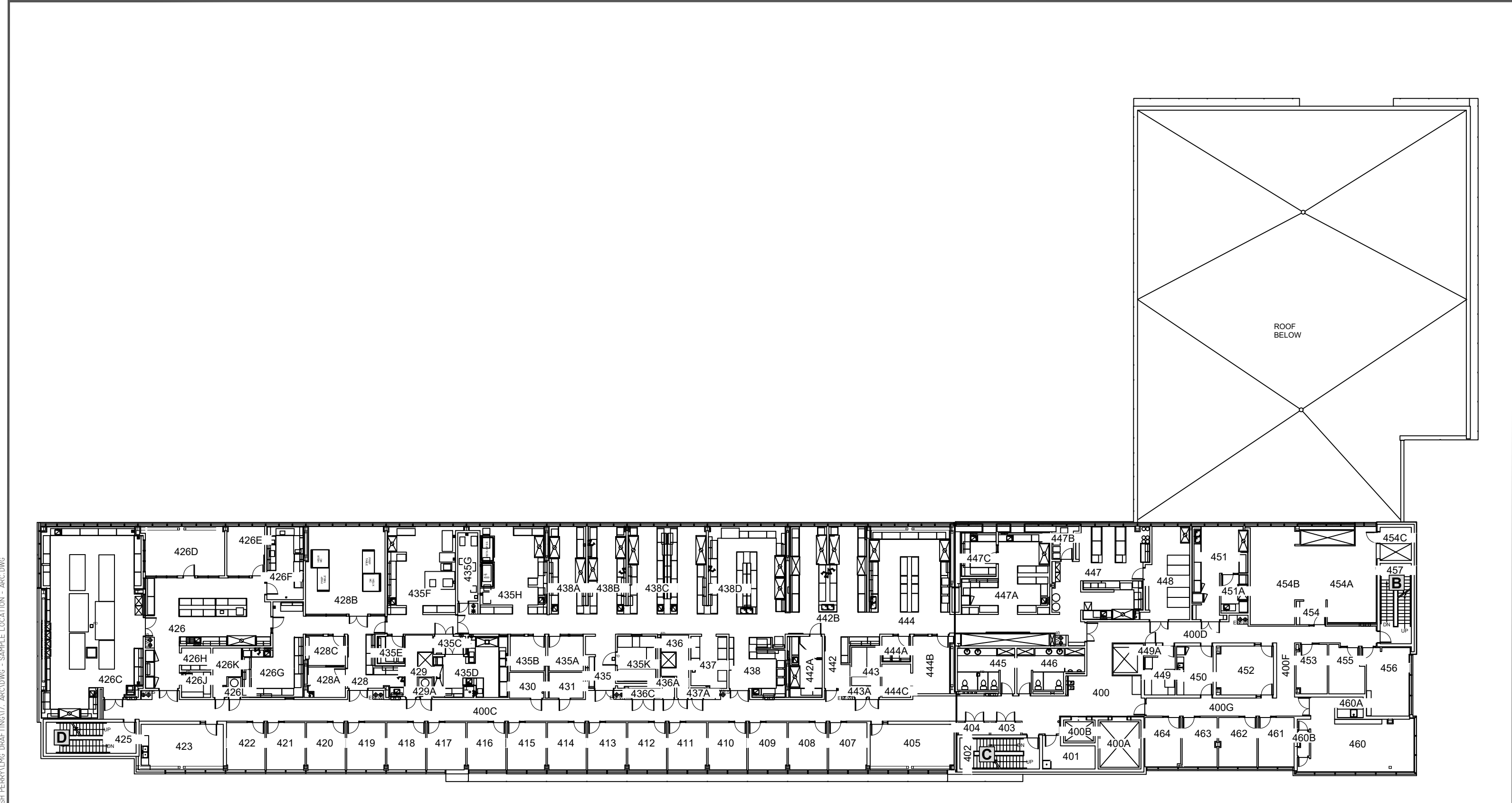
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CLIENT: UNIVERSITY OF OTTAWA
 PROJECT: ADVANCED RESEARCH COMPLEX
 HAZARDOUS MATERIALS SURVEYS

TITLE: SAMPLE LOCATIONS
 LEVEL 3
 SCALE: 1:300
 DATE: JULY 22, 2020
 DRAWN: D.B.
 CHECKED: M.M.

REV. NO.	DESCRIPTION	DATE	BY	APPD.

DRAWING NUMBER: A3



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Legend:
 ▲ Asbestos Bulk Sample
 □ Lead Paint Sample <LOD
 ■ Lead Paint Sample >LOD

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CLIENT: UNIVERSITY OF OTTAWA
 PROJECT: ADVANCED RESEARCH COMPLEX
 HAZARDOUS MATERIALS SURVEYS

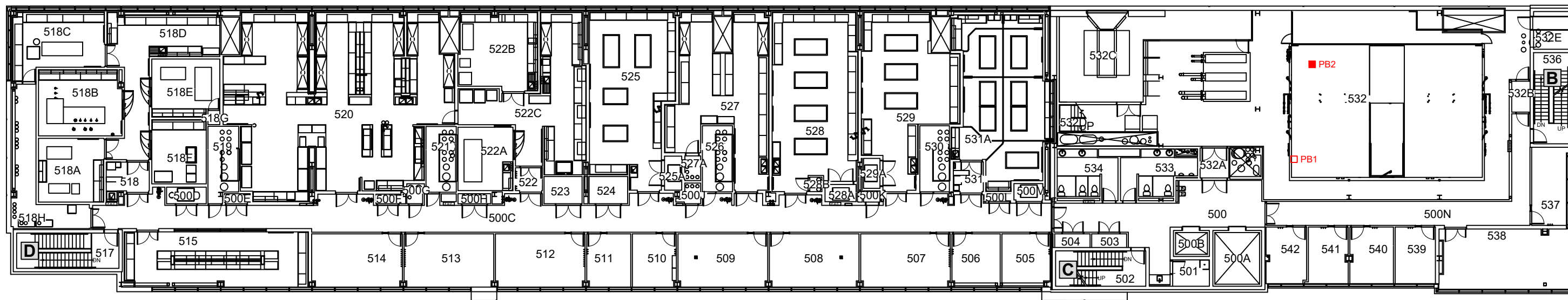
TITLE: SAMPLE LOCATIONS
 LEVEL 4
 SCALE: 1:300
 DATE: JULY 22, 2020
 DRAWN: D.B.
 CHECKED: M.M.

REV. NO.	DESCRIPTION	DATE	BY	APPD.

DRAWING NUMBER: A4

C:\USERS\DIANA\B\ONEDRIVE - MCINTOSH PERRY\LMG DRAFTING\17 - ARC.DWG - SAMPLE LOCATION - ARC.DWG

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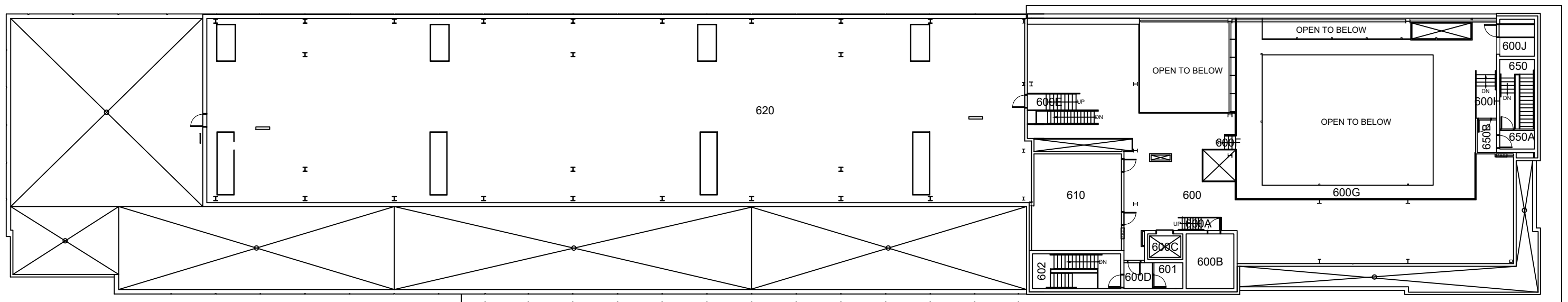
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- Legend:**
- ▲ Asbestos Bulk Sample
 - Lead Paint Sample <LOD
 - Lead Paint Sample >LOD

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CLIENT:	UNIVERSITY OF OTTAWA		TITLE:	SAMPLE LOCATIONS LEVEL 5	
PROJECT:	ADVANCED RESEARCH COMPLEX HAZARDOUS MATERIALS SURVEYS		SCALE:	1:300	DATE:
			DRAWN:	D.B	CHECKED:
					M.M
REV. NO.	DESCRIPTION	DATE	BY	APPD.	REV.:
					DRAWING NUMBER: A5

C:\USERS\DIANA\B\ONEDRIVE - MCINTOSH PERRY\LMG DRAFTING\17 - ARC.DWG - SAMPLE LOCATION - ARC.DWG



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 ■ Lead Paint Sample >LOD

THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS, REPORT ALL ERRORS AND OMISSIONS TO THE CONSULTANTS, PRIOR TO PROCEEDING WITH ANY WORKS.

CLIENT: UNIVERSITY OF OTTAWA
 PROJECT: ADVANCED RESEARCH COMPLEX
 HAZARDOUS MATERIALS SURVEYS

TITLE: SAMPLE LOCATIONS
 LEVEL 6
 SCALE: 1:300
 DATE: JULY 22, 2020
 DRAWN: D.B
 CHECKED: M.M

REV. NO.	DESCRIPTION	DATE	BY	APPD.
DRAWING NUMBER: A6				REV.: