FINAL REPORT

COMPREHENSIVE DESIGNATED SUBSTANCES AND HAZARDOUS MATERIALS ASSESSMENT

R13 MASSEY HALL LIBRARY OFFICES
ROYAL MILITARY COLLEGE, KINGSTON

SELECT DCC Project No. KN139938, Contract No. 58597

Submitted to:

Defence Construction Canada
Ontario Regional Office
780 Midpark Drive, Suite 205
Kingston, Ontario, K7M 7P6

Submitted by:

BluMetric Environmental Inc.
4 Cataraqui Street
The Woolen Mill, The Tower
Kingston, ON K7K 1Z7

BluMetric File #: K-B13279-00-00

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780 Midpark Drive, Suite 205
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Attention: Christopher Newar,
Coordinator, Contract Services

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BluMetric Environmental Inc.
The Tower, The Woolen Mill
4 Cataraqui Street,
Kingston, ON, K7K 1Z7

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1. INTRODUCTION

BluMetric Environmental Inc. (BluMetric®) submits this comprehensive Designated Substances and Hazardous Materials Survey (DS/HMS) Report requested by Defence Construction Canada (DCC) in support of a planned renovation at the R13 Massey Hall Library Offices located at 7 Valour Drive, Royal Military College, Kingston Ontario. The designated substances include all governed by Ontario Regulation 490/09 and 278/05. This report details the findings of the gap analysis and location-specific DS/HMS in support of the following renovation projects:

(a) Elevator upgrade and retrofitting the main electrical supply
(b) Install a fire prevention sprinkler and lighting system
(c) Retrofit controls of the HVAC system.

The area of the Massey Hall Library is approximately 5,900 m^2 and is currently occupied by the Royal Military College of Canada.

Note that this report addresses all rooms deemed to be included in one or more of the renovation projects, but not all of the building. The crawlspace is not included in this report and will be visited prior to the final report being issued.

2. METHODOLOGY

BluMetric reviewed the limited non-destructive DSHMS report titled "*Limited Designated Substance and Hazardous Material Survey – Phase II, Massey Hall Library Offices (R13)*" completed by Ontario Environmental & Safety Network Ltd. (OESN) in January 2013, and attended a meeting and walkthrough assessment on April 27, 2015 with the DCC Project Manager and DND Representative. We reviewed the proposed work plans in order to identify additional samples that would be required. BluMetric was on site from May 4-6, 2015 to inspect the areas to be affected during the proposed work, confirm previous report findings and take additional samples, as required.

It is our understanding that the following upgrade projects are to be performed in the Massey Hall Library building, and our assessment included these areas:

- The elevator system will be updated. Some walls and some flooring will be removed in the following rooms due to the elevator upgrade: crawlspace, 004, 021, 113, 205, 212, 215, 366 and the roof;
- The interior of the elevator shaft will be altered;
- Stairwell 38A/38B will be removed and sealed;

- Fire-prevention sprinkler systems will be added in accordance to the renovation design documents;
- Some terrazzo flooring in the entrance area of room 010 will be removed;
- Radiator heat controls will be upgraded;
- An escape ladder will be secured to the outside of the building from the roof;
- HVAC systems will be updated in accordance to the renovation design documents;
- An interior "bridge" will be constructed from room 201 to room 212;
- Emergency lighting systems will be replaced and/or updated;
- Smoke detectors will be replaced.

Samples were collected for asbestos and lead leachate (TCLP) analysis only if the surfaces and/or building materials (i.e., walls, ceilings and/or floors) were identified as affected by the upcoming renovation projects. BluMetric collected sufficient samples of building materials to assess the presence and type of asbestos-containing materials (ACM), and leachable lead content of paint.

Designated substances are defined by the Ontario Regulation respecting Designated Substances (O. Reg. 490/09). In this survey, the designated substances specifically evaluated were asbestos and lead. Silica is anticipated to be present in all poured concrete and pre-fabricated concrete products.

2.1 ASBESTOS

The definition of asbestos-containing material (ACM) is a material that contains 0.5 percent or more asbestos by dry weight per the Ontario Regulation respecting Designated Substances – Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05) made under the Ontario Occupational Health and Safety Act. An asbestos survey had previously been completed for the Massey Library building by OESN and reported in January 2013. BluMetric did not duplicate sampling and/or analysis for materials previously addressed by OESN. For all other building materials, including those presumed by OESN to contain or not contain asbestos, or not previously identified by OESN, BluMetric collected representative samples for analysis. Multiple samples were collected for each homogeneous material for compliance with O. Reg. 278/05. For most homogeneous materials, samples were analyzed positive-stop for efficiency and cost effectiveness.

Samples were collected in accordance with the requirements of a Type 1 operation defined by O. Reg. 278/05. When required, material to be sampled was dampened with a wetting agent (water with a surfactant) using a spray bottle. Representative samples were collected using a utility knife and/or scraper, which were cleaned between each sample to prevent cross-contamination. Samples were sealed in individually labelled sample bags, and were

identified with a unique sample number and the project information. Representative photographs of sampling locations were taken. All samples were submitted to Paracel Laboratories Limited (Paracel), which is CALA - (Canadian Associated for Laboratory Accreditation Inc.)/ NVLAP - (National Voluntary Laboratory Accreditation Program) accredited for the required analyses, using strict chain-of-custody records/protocol. The samples were analyzed by PLM (polarized light microscopy) using EPA Method 600/R-93/116. BluMetric staff used field notes, cameras, and checklists to record observations and evidence. Relevant photos are included with the results in Appendix A, Tables 1 and 2. Updated site plans/drawings with sample locations are included in Appendix B. Full laboratory reports and chain of custody records are provided in Appendix C.

2.2 LEAD AND LEACHABLE LEAD

Representative painted surfaces were collected for analysis of TCLP leachable lead content. The definition of lead is a material that contains 90 μg/g or more per the Surface Coating Materials Regulations (SOR/2005-109) made under Canada Consumer Product Safety Act. The definition of leachable lead is a waste material that contains 5 mg/L or more per the Ontario Regulation 347 (558/00) – Schedule 4 Leachate Quality Criteria.

Samples were collected of representative painted surfaces in areas where selected walls and other surfaces will be removed and disposed of in the Massey Library building. Paint samples were collected using a utility knife and/or scraper, which were cleaned between each sample to prevent cross-contamination. Samples were sealed in individually labelled sample bags, and were identified with a unique sample number and the project information. Representative photographs of sample locations were taken. All samples were submitted to Paracel Laboratories Limited (Paracel), which is CALA - (Canadian Associated for Laboratory Accreditation Inc.)/ NVLAP - (National Voluntary Laboratory Accreditation Program) accredited for the required analyses, using strict chain-of-custody records/protocol. The samples were analyzed for quantification by inductively coupled plasma/ mass spectrometry (ICP/MS) following EPA Method 6020. BluMetric staff used field notes, cameras and checklists to record observations and evidence. Relevant photos are included in with the results Appendix A, Table 3. Updated site plans/drawings with sample locations are included in Appendix B. Full laboratory reports and chain of custody records are provided in Appendix C.

2.3 ARSENIC

Arsenic-containing paint was identified by OESN in rooms 1, 2A, 3, 4, 5, 5A, 7, 8, 10, 11, 12, 13, 13A, 14, 14A, 15, 16, 17, 19, 21, 25A, 30A (1), 30A (2), 36C, 37, 38, 40, 113, 116, 125, 134, 135, 204A, 214A, 217, 224, 225, 312, 332, 334, 352, 353, 355, 356, 363, 368. All arsenic-containing painted surfaces should be treated with caution and contractors should take proper measures to control dust production during alterations or demolition. Arsenic-containing painted surfaces must be disposed of accordingly.

There are currently no regulated provincial or federal limits for arsenic in paint, therefore all paints containing arsenic above the method detection limit were classified as arsenic-containing paint.

2.4 CHROMIUM

Chromium-containing paint was identified by OESN in rooms 1, 2, 2A, 2B, 2C, 3, 4, 5, 5A, 7, 8, 10, 11, 12, 13, 13A, 14, 14A, 15, 16, 17, 18, 19, 21, 22, 23, 25, 25A, 30A (1), 30A (2), 36C, 37, 38, 40, 101A, 107C, 113, 116, 117, 125, 134, 135, 204A, 205, 210, 212, 214A, 215, 217, 224, 225, 312, 313, 314, 327A, 332, 334, 352, 353, 354, 355, 356, 363, 368 and 369. All chromium-containing painted surfaces should be treated with caution and contractors should take proper measures to control dust production during alterations or demolition. Chromium-containing painted surfaces must be disposed of accordingly.

There are currently no regulated provincial or federal limits for chromium in paint, therefore all paints containing arsenic above the method detection limit were classified as chromium-containing paint.

2.5 MERCURY

The definition of mercury for a building materials survey is mercury in an exposed form. When mercury is enclosed within a system (such as within a thermostat or fluorescent light), it is not in exposed form unless/until the encapsulation is broken. These materials must be disposed as mercury-containing waste. The following building materials may contain mercury: thermostats, thermometers, barometers, and fluorescent lights.

Mercury-containing paint was identified by OESN in rooms 1, 2, 2A, 8, 11, 16, 17, 18, 19, 22, 23, 25, 30A (2), 40, 107C, 117, 125, 210, 212, 217, 312, 313, 314, 327A, 332, 334, 353, 354, 355 and 369. All mercury-containing painted surfaces should be treated with caution and contractors

should take proper measures to control dust production during alterations or demolition. Mercury-containing painted surfaces must be disposed of accordingly.

2.6 SILICA

No samples were collected for silica analysis. Silica is anticipated to be found above all dropped ceilings on the upper cement ceilings. Silica is anticipated to be present in all poured concrete and pre-fabricated concrete products. The definition of silica is crystalline silica in a respirable form (O. Reg. 490/09). Silica that is bound in concrete is not in respirable form until it is mechanically disturbed (e.g., during construction, renovation or demolition).

2.7 PCBs

Light fixtures were not inspected by BluMetric, as they were not included in the scope of work. All ballasts should be visually inspected, and the manufacturer, model number and serial number should be compared to the Environment Canada publication "Identification of Light Ballasts Containing PCBs" (1991) to determine PCB content, prior to disposal.

One of the paint samples collected by OESN was found to contain PCBs above criteria of 50 ug/g, in room 2. PCB-containing painted surfaces should be treated with caution and contractors should take proper measures to control dust production during alterations or demolition. PCB-containing painted surfaces must be disposed of accordingly.

2.8 OTHER DESIGNATED/HAZARDOUS SUBSTANCES

The remaining designated substances (acrylonitrile, benzene, coke oven emissions, ethylene oxide, isocyanates, vinyl chloride) were not observed in the building and therefore are not included in the survey.

3. RESULTS – MASSEY HALL LIBRARY

Summaries and results of the samples collected for potential asbestos-containing materials (ACM) and potential leachable lead in paints are provided in Appendix A in Tables 1 - 3. The complete list of confirmed asbestos-containing materials is provided in Table 1. The complete list of sampled materials that were confirmed to not contain asbestos is provided in Table 2. The complete list and results of sampled painted surfaces is provided in Table 3.

3.1 ASBESTOS

Possible asbestos-containing materials that were noted by BluMetric but not sampled (since they will not be affected by the upcoming renovation projects) include window caulking, pipe gaskets in the basement, transite board material (bulk head) lining the elevator shaft, and cement patch material noticed between the pipes and walls.

Flooring in rooms 007, 011, 013, 100, 117A, 211G, 210, 300, and the stairwell 38A/38B was sampled and identified to be non-asbestos containing. The exterior mortar and roofing tar was sampled and does not contain asbestos.

Asbestos-containing materials (≥0.5%) are identified as follows:

i. Asbestos insulation was identified on pipe elbows, t-joints, pipe voids (residual ACM debris on uncovered pipe material), pipe lengths and / or white tape on vent ducts are found in rooms: 2, 7, 8, 10, 11, 12, 13A, 14A, 15, 18, 20, 23, 25, 26, 38, 40, 103, 107C, 116, 117, 118A, 128, 205, 212, 214A, 215, 220, 305, 305A, 305B, 305C, 306, 312, 313, 313A, 313B, void behind 320, 340, 342, 352, 353, 366.
ii. Asbestos transite board was identified on walls in rooms: 7, 15, 19, 204, 220, 308A, 313A, 313B, 334, 342, 342A, 352, 353, 354 and 355.
iii. Suspected/assumed transite board was identified along the entire shaft of the elevator (21).
iv. Assumed asbestos debris at the floor level of the main pipe chase in rooms 118A, 214A and 305A.
v. Asbestos-containing sink glazing in rooms 17, 107A, 126 and 216.
vi. Asbestos-containing paper light shield in rooms 36C and 224.
vii. Assumed asbestos present in mechanical fire doors in rooms 2 and 2A.
viii. Assumed asbestos-containing chalkboard in rooms 7, 15, 329, 330, 340 and 350.
ix. Assumed asbestos-containing paper light gasket in rooms 2, 2A, 2C, 17 and 18.

3.2 LEAD

Lead (>90 μg/g) in paint is identified as follows:

i. All painted surfaces contain lead with the exception of the single layer white painted surfaces (e.g., white metal pan ceiling tiles); however, all white painted surfaces should be inspected for lead-containing sub-surface paint layers prior to any alterations to the painted surfaces.
ii. It is likely that the plumbing pipes contain lead.

iii. All samples collected for leachable lead resulted in concentrations of leachable lead below the criteria of 5 mg/L. No special precautions are required for waste disposal of lead-containing paint.

4. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on the comprehensive DSHMS completed by BluMetric, including observations and samples collected from May 4 - 6, 2015 and includes findings from the OESN report (January 2013) by BluMetric.

Care should be taken when working near ACM. Building materials including (but not limited to) pipe elbows, fittings, couplings, hangers, gaskets, doors, and floors that have been identified as asbestos-containing must be abated or managed as asbestos-containing material as per the action levels specified in Table 1 prior to the (a) elevator upgrade, retrofit of the main electrical supply, (b) upgrade of the fire prevention sprinkler and lighting system, and (c) retrofit controls of the HVAC system, Details including the material types, descriptions, room numbers, quantities, conditions, and action levels are provided in Table 1. Proper respirator with P100 cartridges and other personal protective equipment should be worn when disturbing ACM.

All painted material, except for the single layer white paint (PB12) and green painted pipes (PB08) in the mechanical room, contain lead, chromium, mercury, PCBs, and/or arsenic. White painted surfaces should be inspected in order to determine if layers are present beneath surface coating prior to alterations (which may present hazards). If painted surfaces are altered during the renovations, dust-suppression measures must be taken and respirators with P100 cartridges and other protective personal equipment should be worn according to the Ontario Lead on Construction Projects Guideline.

The following definitions are used with respect to ACM remediation, as per DND AMD, Asbestos Condition Assessment and Response Chart:

ACTION 1 – Restrict access to the area and clean up the ACM debris using appropriate asbestos procedures.
ACTION 2 – Restricted Entry into areas that contain, or may contain ACM Debris. All entry into the area will require at a minimum Type 2 procedures until the ACM debris have been cleaned up, and the source of the debris have been stabilized or removed.
ACTION 3 – Asbestos removal required for compliance. Develop scope of work and utilize appropriate removal procedures.
ACTION 4 – Limited Entry: personnel who enter into these areas have to be aware of the presence of the type and location of the ACM. If any entry into the area may cause a disturbance of the ACM, Type 2 procedures must be used for entry until the ACM is removed.
ACTION 5 – ACM may be repaired if the ACM is considered to be in Fair Condition (less than 10% damaged), and it is unlikely for the material to be damaged, or disturbed again. Once the ACM has been repaired it may be treated as in GOOD condition (less than 1% damaged).

ACTION 6 – No remedial action is required. The materials are to be managed in accordance with the Asbestos Management Directive.
NOTE: *Pro Active Removal may be a part of an Asbestos Management plan or for removal of ACM that are in locations that may not be desirable regardless of the materials condition.*

Recommendations related to the removal and potential disturbance of ACM and other hazardous building materials for specific construction and renovation projects are as follows:

Construction of Interior "bridge" from 201 to 212

- Suspected asbestos containing flooring material was sampled and analyzed. Flooring materials sampled do not contain ACM.
- Silica containing materials may be disturbed during the construction of the interior bridge. Silica dust should be suppressed when drilling or disturbing cement-type materials.
- Painted materials that are anticipated to be removed during the upcoming renovation projects were analyzed for leachable (TCLP) lead. The concentrations of leachable lead were all found to be below MOE criteria (5 mg/L). Materials that were confirmed as non-leachate toxic can be disposed of as non-hazardous material.
- If lead, chromium, mercury, PCBs, and/or arsenic containing painted surfaces are altered during the renovations, dust-suppression measures must be taken and respirators with P100 cartridges and other protective personal equipment should be worn according to the Ontario Lead on Construction Projects Guideline.

Securing of Exterior Escape Ladder

- Unpainted exterior material that was suspected to contain asbestos was sampled and analyzed. All exterior materials sampled do not contain ACM; however, they may contain silica. Silica dust should be suppressed when drilling or securing onto the unpainted cement exterior walls.

Removal of Terrazzo Floor in 010

- Terrazzo flooring in the entrance area of room 010 does not contain ACM; however, it may contain silica. Silica dust should be suppressed when disturbing cement-type materials.

Removal of Stairwell 38A/38B

- Painted materials that are anticipated to be removed during the upcoming renovation projects were analyzed for leachable (TCLP) lead. The concentrations of leachable lead were all found to be below MOE criteria (5 mg/L). Materials that were confirmed as non-leachate toxic can be disposed of as non-hazardous material.
- If lead, chromium, mercury, PCBs, and/or arsenic containing painted surfaces are altered during the renovations, dust-suppression measures must be taken and respirators with

P100 cartridges and other protective personal equipment should be worn according to the Ontario Lead on Construction Projects Guideline.

Elevator Upgrade and Retrofitting the Main Electrical Supply

- A transite board bulkhead was identified inside the elevator shaft, extending vertically from the basement to the third floor. This material should be removed prior to any alterations to the elevator shaft as a Type 1 abatement procedure, in accordance with the DND Asbestos Management Directive (AMD). Refer to Table 1 for further details.
- If lead, chromium, mercury, PCBs, and/or arsenic containing painted surfaces are altered during the renovations, dust-suppression measures must be taken and respirators with P100 cartridges and other protective personal equipment should be worn according to the Ontario Lead on Construction Projects Guideline.
- Painted materials that are anticipated to be removed during the upcoming renovation projects were analyzed for leachable (TCLP) lead. The concentrations of leachable lead were all found to be below MOE criteria (5 mg/L). Materials that were confirmed as non-leachate toxic can be disposed of as non-hazardous material.
- Silica dust should be suppressed when drilling or securing onto the unpainted cement ceilings found above dropped ceilings.

Installing a Fire Prevention Sprinkler and Lighting System

- ACM Action 3 (ACM removal required for compliance): The pipe elbow in room 02 and the assumed debris along the floor lengths of rooms 118A, 214A are 305A are Action 3, asbestos removal is required for compliance. Refer to Table 1 for further details. It is recommended that the material be removed in accordance with DND AMD Appendix E, Type 2 Abatement: Procedures – Prior to Removal of ACM (Steps 3.2.1 – 3.2.3), Procedure – Pipe Insulation Removal Using Glove Bag (Steps 3.4.1 – 3.4.9), Procedures – During and After Clean-up (Steps 3.5.1 – 3.5.5). Worker respiratory protection during removal shall be achieved by wearing one of the following: non-powered reusable or replaceable filter-type respirator equipped with HEPA (P100, N100 or R100) filter cartridges; non-powered air-purifying full-face piece respirator with HEPA (P100, N100 or R100) filter cartridges; powered air-purifying respirator with a tight-fitting face piece and HEPA (P100, N100 or R100) filter cartridges; negative pressure (demand) supplied air respirator with a full-face piece and HEPA (P100, N100 or R100) filter cartridges; or continuous supplied air respirator with a tight fitting face piece (half- or full-face piece). In addition, worker protection during removal shall be achieved by wearing disposable-type protective full-body clothing (including head-covering, snug-fitting cuffs at wrists and ankles) that does not readily retain or permit penetration of asbestos fibres. These worker personal protective requirements comply with both Ontario Regulation 278/05 and DND AMD.

- **ACM Action 5:** The pipe elbows in rooms 10, 11, 14A, 20, 40, 103, 107C, 116, 117, 118A, 128, 212, 214A (elbows), 215, 220, 305A, 306, the pipe lengths in rooms 118A, 214A, 305A, 340, 366, and the paper light shield in rooms 36C and 224 are in fair condition. Refer to Table 1 for further details. The pipe elbows, pipe lengths, and paper light shields should be treated as Action 5 - ACM may be repaired if the ACM is considered to be in Fair Condition (less than 10% damaged), and it is unlikely for the material to be damaged, or disturbed again. After the ACM has been repaired it may be treated as in GOOD condition (less than 1% damaged). If ACM is likely to be disturbed during repairs or alteration, it is recommended that the material be removed in accordance with DND AMD Appendix E, Type 2 Abatement: Procedures – Prior to Removal of ACM (Steps 3.2.1 – 3.2.3), Procedure –Insulation Removal Using Glove Bag (Steps 3.4.1 – 3.4.9), Procedures – During and After Clean-up (Steps 3.5.1 – 3.5.5). Worker respiratory protection during removal shall be achieved by wearing one of the following: non-powered reusable or replaceable filter-type respirator equipped with HEPA (P100, N100 or R100) filter cartridges; non-powered air-purifying full-face piece respirator with HEPA (P100, N100 or R100) filter cartridges; powered air-purifying respirator with a tight-fitting face piece and HEPA (P100, N100 or R100) filter cartridges; negative pressure (demand) supplied air respirator with a full-face piece and HEPA (P100, N100 or R100) filter cartridges; or continuous supplied air respirator with a tight fitting face piece (half- or full-face piece). In addition, worker protection during removal shall be achieved by wearing disposable-type protective full-body clothing (including head-covering, snug-fitting cuffs at wrists and ankles) that does not readily retain or permit penetration of asbestos fibres. These worker personal protective requirements comply with both Ontario Regulation 278/05 and DND AMD. The light shields should be removed as a Type 1.
- All other pipe ACM found in this building should be treated as **ACM Action 6** - No remedial action is required. However, if any asbestos-containing pipes identified in Table 1 are disturbed (due to oversight, change in work plan, or other unforeseen circumstances) during the retrofitting of the fire prevention sprinkler and lighting system, the material should be removed as a Type 2 Abatement: Procedures – Prior to Removal of ACM (Steps 3.2.1 – 3.2.3), Procedure – Pipe Insulation Removal Using Glove Bag (Steps 3.4.1 – 3.4.9), Procedures – During and After Clean-up (Steps 3.5.1 – 3.5.5). Worker respiratory protection during removal shall be achieved by wearing one of the following: non-powered reusable or replaceable filter-type respirator equipped with HEPA (P100, N100 or R100) filter cartridges; non-powered air-purifying full-face piece respirator with HEPA (P100, N100 or R100) filter cartridges; powered air-purifying respirator with a tight-fitting face piece and HEPA (P100, N100 or R100) filter cartridges; negative pressure (demand) supplied air respirator with a full-face piece and HEPA (P100, N100 or R100) filter cartridges; or continuous supplied air respirator with a tight fitting face piece (half- or full-face piece). In addition, worker protection during removal shall be

achieved by wearing disposable-type protective full-body clothing (including head-covering, snug-fitting cuffs at wrists and ankles) that does not readily retain or permit penetration of asbestos fibres. These worker personal protective requirements comply with both Ontario Regulation 278/05 and DND AMD. The materials are to be managed in accordance with the Asbestos Management Directive. The locations of these ACM pipes are found in **Table 1**.

- If lead, chromium, mercury, PCBs, and/or arsenic containing painted surfaces are altered during the renovations, dust-suppression measures must be taken and respirators with P100 cartridges and other protective personal equipment should be worn according to the Ontario Lead on Construction Projects Guideline.

Radiator Retrofitting and Smoke Detector Replacement

- Selected radiators were inspected for ACM. No potential asbestos-containing material was noted on the radiators.
- Smoke detectors may contain trace amounts of radioactive material. Smoke detectors should be disposed of at an appropriate disposal facility.
- If lead, chromium, mercury, PCBs, and/or arsenic containing painted surfaces are altered during the renovations, dust-suppression measures must be taken and respirators with P100 cartridges and other protective personal equipment should be worn according to the Ontario Lead on Construction Projects Guideline.

Retrofit Controls of the HVAC System

- **ACM Action 5:** The white tape along the duct pipes in rooms 340, 342, 352, 353, 366 are in fair condition and should be treated as Action 5 - ACM may be repaired if the ACM is considered to be in Fair Condition (less than 10% damaged), and it is unlikely for the material to be damaged, or disturbed again. After the ACM has been repaired it may be treated as in GOOD condition (less than 1% damaged). However, if any asbestos-containing white tape identified in Table 1 is disturbed (due to oversight, change in work plan, or other unforeseen circumstances) during the retrofitting of the HVAC system controls, the material should be removed in accordance with DND AMD Appendix E, Type 2 Abatement: Procedures – Prior to Removal of ACM (Steps 3.2.1 – 3.2.3), Procedure – Pipe Insulation Removal Using Glove Bag (Steps 3.4.1 – 3.4.9), Procedures – During and After Clean-up (Steps 3.5.1 – 3.5.5). Refer to Table 1 for further details. Worker respiratory protection during removal shall be achieved by wearing one of the following: non-powered reusable or replaceable filter-type respirator equipped with HEPA (P100, N100 or R100) filter cartridges; non-powered air-purifying full-face piece respirator with HEPA (P100, N100 or R100) filter cartridges; powered air-purifying respirator with a tight-fitting face piece and HEPA (P100, N100 or R100) filter cartridges; negative pressure (demand) supplied air respirator with a full-face piece and HEPA

(P100, N100 or R100) filter cartridges; or continuous supplied air respirator with a tight fitting face piece (half- or full-face piece). In addition, worker protection during removal shall be achieved by wearing disposable-type protective full-body clothing (including head-covering, snug-fitting cuffs at wrists and ankles) that does not readily retain or permit penetration of asbestos fibres. These worker personal protective requirements comply with both Ontario Regulation 278/05 and DND AMD.

- All other duct ACM found in this building should be treated as **Action 6** - No remedial action is required. However, if any asbestos-containing ducts or duct insulation identified in Table 1 is disturbed (due to oversight, change in work plan, or other unforeseen circumstances) during the retrofitting of the HVAC system controls, the material should be removed as a Type 2 Abatement: Procedures – Prior to Removal of ACM (Steps 3.2.1 – 3.2.3), Procedure – Pipe Insulation Removal Using Glove Bag (Steps 3.4.1 – 3.4.9), Procedures – During and After Clean-up (Steps 3.5.1 – 3.5.5). Worker respiratory protection during removal shall be achieved by wearing one of the following: non-powered reusable or replaceable filter-type respirator equipped with HEPA (P100, N100 or R100) filter cartridges; non-powered air-purifying full-face piece respirator with HEPA (P100, N100 or R100) filter cartridges; powered air-purifying respirator with a tight-fitting face piece and HEPA (P100, N100 or R100) filter cartridges; negative pressure (demand) supplied air respirator with a full-face piece and HEPA (P100, N100 or R100) filter cartridges; or continuous supplied air respirator with a tight fitting face piece (half- or full-face piece). In addition, worker protection during removal shall be achieved by wearing disposable-type protective full-body clothing (including head-covering, snug-fitting cuffs at wrists and ankles) that does not readily retain or permit penetration of asbestos fibres. These worker personal protective requirements comply with both Ontario Regulation 278/05 and DND AMD. The materials are to be managed in accordance with the Asbestos Management Directive. The locations of these ducts are found in **Table 1**.
- If lead, chromium, mercury, PCBs, and/or arsenic containing painted surfaces are altered during the renovations, dust-suppression measures must be taken and respirators with P100 cartridges and other protective personal equipment should be worn according to the Ontario Lead on Construction Projects Guideline.

Other Recommendations According to Previous OESN Report

- Based on the previous OESN report, all other ACM found in this building will not be disturbed during the upcoming construction and renovation projects and should be treated as **ACM Action 6** - No remedial action is required. However, if any asbestos-containing material identified in the OESN report is disturbed (due to oversight, change in work plan, or other unforeseen circumstances) during the upcoming construction and renovation projects, the material should be removed in accordance with the DND AMD.

5. CONFIDENTIALITY / CLOSING

The conclusions presented in this report represent our professional opinion and are based upon the work described in this report and any limiting conditions in the terms of reference, scope of work, or conditions noted herein.

The findings presented in this report are based on conditions observed at the specified dates and locations, the analysis of samples for the specified parameters, and information obtained for this project. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, locations that were not investigated directly, or types of analysis not performed.

BluMetric makes no warranty as to the accuracy or completeness of the information provided by others, or of conclusions and recommendations predicated on the accuracy of that information.

Nothing in this report is intended to constitute or provide a legal opinion. BluMetric makes no representation as to compliance with occupational health and safety laws, rules, regulations or policies established by regulatory agencies.

This report has been prepared for Defence Construction Canada. Any use a third party makes of this report, any reliance on the report, or decisions based upon the report, are the responsibility of those third parties unless authorization is received from BluMetric in writing. BluMetric accepts no responsibility for any loss or damages suffered by any unauthorized third party as a result of decisions made or actions taken based on this report.

Respectfully submitted,
BluMetric Environmental Inc.



Véronique Maynard, Env.Tech.
Environmental/Occupational Technician



Kenneth Major, M.Sc.A.
Occupational Hygienist



Reviewed by:
Lydia Renton, B.Sc., CIH, ROH, FAIHA
Director, Occupational Hygiene & Safety

APPENDIX A

Tables of Results – Massey Hall Library

Table 1: Materials Confirmed to Contain Asbestos
Table 2: Materials Confirmed to NOT Contain Asbestos
Table 3: Paint results for Lead, Leachable Lead, Arsenic, Chromium and Mercury

Table 1: Materials Confirmed to Contain Asbestos – Massey Hall Library – May 4-6, 2015

Photo	Sample No.	Material Type and Description	Sample Room #	All Locations with Material - Room # (Quantity)	Total Quantity	Asbestos Content[1] and Type	Accessible[2]	Friable[3]	Condition[4]	Abatement[5]
Refer to OESN report[6]	DHW 00012.0002- T01 DHW 00012.0002- T02 DHW 00012.0002- T03 DHW 00012.0002- T04 DHW 00012.0002- T05 DHW 00012.0002- T06 Drain Coupling 00012.0002- T07 Drain Coupling 00012.0002- T08 Drain Coupling 00012.0002- T09 00012.0002- T16 00012.0002- T17 00012.0002- T18	Pipe elbows, "t-joints", hangers, valves and voids (parging is off-white coloured, cementacious material)	2, 14 A, 107C	2 (88 fittings and 18 couplings) 7 (6 pipe elbows) 8 (4 fittings) 10 (15 pipe elbows 11 (3 elbows) 12 (3 pipe elbows) 13A (4 elbows) 14A (17 fittings) 20 (12 hangers) 23 (3 elbows) 26 (1 elbow) 38 (1 elbow) 40 (2 elbows) 103 (2 fittings) 107C (1 fittings) 116 (4 fittings) 117 (4 fittings) 118A (8 fittings) 128 (11 fittings) 205 (3 elbows) 212 (2 fittings) 214A (3 fittings and 4 couplings) 215 (2 elbows) 220 (1 fittings) 305 (14 fittings and 2 couplings) 305A (11 fittings and 32 couplings) 305B/305C (28 couplings) 306 (4 couplings) 312 (1 pipe elbow void) 313 (1 pipe elbow void) Void behind 320 (2 pipe voids/elbows) 340 (2 couplings) 366 (3 couplings, 5 voids)	334 fittings, couplings, elbows, hangers and voids	60% Chrysotile/40% Chrysotile	A-C	Yes	Poor (1 in room 2), Good for remainder in room 2, 8, 14, 20 214A, 305, 305A, 305B/305C, 312, 313, 340, 366) Fair in all other rooms	**Action level 3** for 1 elbow in room 2 **Action level 6** for rooms 2, 7, 8, 12, 13A, 20, 26, 38, 205, 214A (couplings), 305, 305A, 305B/305C, 340, 312, 313, 366, Void behind 320 **Action level 5** for rooms 10, 11, 14A, 20, 40, 103, 107C, 116, 117, 118A, 128, 212, 214A (elbows), 215, 220, 305A, 306

Table 1: Materials Confirmed to Contain Asbestos – Massey Hall Library – May 4-6, 2015

Photo	Sample No.	Material Type and Description	Sample Room #	All Locations with Material - Room # (Quantity)	Total Quantity	Asbestos Content[1] and Type	Accessible[2]	Friable[3]	Condition[4]	Abatement[5]
Refer to OESN report[6]	HT0-05-T13 HT0-05-T14 HT0-05-T15	Parging along linear pipe lengths (parging is off-white coloured, cementacious material)	2, 214A	2 (linear lengths - 3 pipes) 10 (along linear length – 4 pipes) 11 (pipe lengths – 4 pipes) 13A (along linear lengths - 2 pipes) 15 (along linear lengths -1 pipe) 18 (along linear lengths - 3 pipes) 23 (along linear lenghts - 1 pipe) 38 (along linear lengths - 1 pipe) 118A (along linear lengths - 7 pipes) 205 (1 pipe length) 214A (along linear lengths - 7 pipes) 215 (1 pipe length) 305A (along linear lengths) 366 (linear lengths 0.28 m^2 and 3 pipe lengths)	46 pipe lengths	20% Chrysotile	A	Yes	Fair in rooms 118A, 214A, 305A, 340, 366 Good in rooms 2, 10, 11, 13A, 15, 18, 23, 38, 205, 215	**Action level 5** in rooms 118A, 214A, 305A, 340, 366 **Action level 6** in rooms 2, 10, 11, 13A, 15, 18, 23, 38, 205, 215
Refer to OESN report[6]	HW 03-00013.002-W13 HW 03-00013.002-W14 HW 03-00013.002-W15	Cement board material (grey 2' x 2' board with evenly spaced holes)	7	7 (46.5 m^2) 15 (41.8 m^2) 19 (15.1 m^2) 204 (46.8 m^2) 220 (19.5 m^2) 308A (8.8 m^2) 313A (29.3 m^2) 313B (26 m^2) 334 (22.3 m^2) 342 (29.7 m^2) 342A (17.7 m^2) 352 (27.9 m^2) 353 (31.6 m^2) 354 (20.4 m^2) 355 (20.4 m^2)	404 m^2	20% Chrysotile	A	No	Fair in room 7, good in all other rooms	**Action level 6**

Table 1: Materials Confirmed to Contain Asbestos – Massey Hall Library – May 4-6, 2015

Photo	Sample No.	Material Type and Description	Sample Room #	All Locations with Material - Room # (Quantity)	Total Quantity	Asbestos Content[1] and Type	Accessible[2]	Friable[3]	Condition[4]	Abatement[5]
Refer to OESN report[6]	N/A	Assumed debris on floor level of main pipe chase	N/A	118A, 214A, 305A	7.5 m^2	Assumed ACM	A	Possible	Poor	**Action level 3**
Refer to OESN report[6]	N/A	Assumed present in the door insulation	N/A	2 and 2A	5 m^2	Assumed ACM	A	No	Good	**Action level 6**
Refer to OESN report[6]	HM-01 00013.002-M01 HM-01 00013.002-M02 HM-01 00013.002-M03	Sink glazing (metallic coating on the underside of sinks)	17	107A, 126, 216	6 sinks	2.5% Chrysotile	A	No	Good	**Action level 6**
Refer to OESN report[6]	HM-03 00013.002-M08 HM-03 00013.002-M09 HM-04 00013.002-M10	Paper light shield (round silver paper-like material)	36C	224	2 paper shields	60% chrysotile	C	Yes	Fair	**Action level 5**
Refer to OESN report[6]	HM-05 00013.002-M13 HM-05 00013.002-M14 HM-05 00013.002-M15	White tape (off-white in colour and approximately 2" wide)	366	313A (1.86 m^2) 313B (1.86 m^2) 340 (1.86 m^2) 342 (1.86 m^2) 352 (1.5m^2) 353 (3 m^2) 366 (4.2 m^2)	12 m^2	40% Chrysotile	C	Yes	Fair to good	**Action level 5** in rooms 340, 342, 352, 353, 366 **Action level 6** in rooms 313A, 313B
Refer to OESN report[6]	N/A	Assumed present in the paper light gasket (off-white and ring shaped found between light fixture and ceiling)	N/A	2 (6 bulbs) 2A (2 bulbs) 2C (2 bulbs) 17 (1 bulb) 18 (1 bulb)	12 bulbs	Assumed ACM	C	No	Good	**Action level 6**

Table 1: Materials Confirmed to Contain Asbestos – Massey Hall Library – May 4-6, 2015

Photo	Sample No.	Material Type and Description	Sample Room #	All Locations with Material - Room # (Quantity)	Total Quantity	Asbestos Content[1] and Type	Accessible[2]	Friable[3]	Condition[4]	Abatement[5]
Refer to OESN report[6]	N/A	Assumed present in chalkboards (green and hard)	N/A	7 (6.7 m^2) 15 (6.7 m^2) 329 (5 m^2) 330 (1.7 m^2) 340 (5 m^2) 350 (1.7 m^2)	26.8 m^2	Assumed ACM	A	No	Good	**Action level 6**
	N/A	Assumed transite material (grey and assumed hard)	Along length of shaft (width is approximately 1 m)	Elevator shaft	Approximately 11 m^2	Assumed ACM	C	No	Good	**Action level 6**

[1] Asbestos-containing material is defined by Ontario Regulation respecting Designated Substance - Asbestos On Construction Projects and In Buildings and Repair Operations (O. Reg. 278/05) as "material that contains 0.5 per cent or more asbestos by dry weight".
[2] A: easily accessible without destruction of barriers and less than 3m from the ground; B: requires the destruction of barriers; C: requires the use of a ladder, ≥ 3m from the ground.
[3] Yes = material can be crumbled, pulverized or powdered under hand pressure. No = material cannot be crumbled, pulverized or powdered by hand pressure alone.
[4] Good = less than 1% of ACM damaged, deteriorated, abraded or delaminated; Fair = 1-10%; Poor = greater than 10% of ACM damaged, deteriorated, abraded or delaminated.
[5] Abatement is not necessarily recommended. Will be renovation specific.
[6] Ontario Environmental & Safety Network Ltd. report "Limited Designated Substance and Hazardous Materials Survey - Phase II, January 2013".

Table 2: Materials Confirmed to NOT Contain Asbestos – Massey Hall Library – May 4-6, 2015

Photo	Sample No.	Sample Room #	Other Rooms with Same Material	Material Type and Description	Results
	A01a,b,c	366	N/A	VFS - Tan and beige mix pattern	ND
	A02a,b,c	366	N/A	Terrazzo - brown and burgundy speckles	ND
	A03a,b,c	215	N/A	VFT - blue 12" x 12" with yellow mastic	ND
	A04a,b,c	202	204	VFT - light and medium grey speckles and streaks	ND
	A05a,b,c	3	4, 113, 213, 215, 363	Terrazzo - burgundy, beige and green flakes on tan terrazzo	ND
	A06a,b,c	117	N/A	Green VFT with white mastic	ND
	A07a,b,c	117	N/A	Beige VFT on white mastic	ND

Table 2: Materials Confirmed to NOT Contain Asbestos – Massey Hall Library – May 4-6, 2015

Photo	Sample No.	Sample Room #	Other Rooms with Same Material	Material Type and Description	Results
	A08a,b,c	20A	36C, 134, 224	Terrazo, light beige and tan speckles	ND
	A09a,b,c	117	Most areas on first floor	VFT - tan with grey and white streaks	ND
	A10a,b,c	212	N/A	VFT - tan with dark grey streaks	ND
	A11a,b,c	205	N/A	VFT - white, light grey, dark grey	ND
	A12a,b,c	Roof	N/A	Roof tar - black	ND
	A13a,b,c	Exterior wall	All exterior walls	Mortar - grey-white	ND

Table 2: Materials Confirmed to NOT Contain Asbestos – Massey Hall Library – May 4-6, 2015

Photo	Sample No.	Sample Room #	Other Rooms with Same Material	Material Type and Description	Results
Refer to OESN report[1]	HW 01 00013.002- W01 HW 01 00013.002- W02 HW 01 00013.002- W03 HW 01 00013.002- W04 HW 01 00013.002- W05 HW 01 00013.002- W06 HW 01 00013.002- W07	103, 117, 204, 212, 215, 301	Walls in rooms (3, 4, 5, 5A, 10, 11, 12, 14A, 20A, 25, 36C, 38A, 38B, 41, 42,101, 101A, 102, 103, 104, 105, 106, 107A, 107B, 107C, 108, 109, 110, 112, 113, 113A, 114, 116, 117, 118, 118A, 122, 124, 126, 127, 128, 134, 202, 204, 204A, 205, 207, 209, 210, 211, 211A, 212, 213, 214A, 215, 216, 217, 218, 220, 224, 301, 302, 303, 304, 304A, 307, 309, 310, 311, 313A, 313B, 315, 316, 317, 319, 320, 321, 322, 323, 324, 325, 326, 327, 327A, 328, 330, 333, 334, 336, 338, 340, 342, 342A, 344, 346, 348, 350, 352, 353, 354, 355, 356, 358, 360, 362, 363, 364, 367, 368	Wall plaster - thin white skim coat and thicker grey cementacious underlay	ND
Refer to OESN report[1]	HW 02 00013.002- W08 HW 02 00013.002- W09 HW 02 00013.002- W10 HW 02 00013.002- W11 HW 02 00013.002- W12	13A, 14, 19, 26	Rooms 12, 13, 13A, 14, 19, 23, 26, 1025, 107A, 107B, 107C, 201, 204, 214, 215, 216, 217, 220, 308, 308A, 313A, 331A, 331B, 342, 342A	Drywall and Drywall Joint Compound (walls)	ND
Refer to OESN report[1]	HW 04 00013.002- W16 HW 04 00013.002- W17 HW 04 00013.002- W18	23	Rooms 7A, 8, 22, 23, 40, 201, 203, 306, 329, 331A, 331B	Texture coat - rough and bumpy, various colours	ND

Table 2: Materials Confirmed to NOT Contain Asbestos – Massey Hall Library – May 4-6, 2015

Photo	Sample No.	Sample Room #	Other Rooms with Same Material	Material Type and Description	Results
Refer to OESN report[1]	HC01 00013.002- CO1 HC01 00013.002- CO2 HC01 00013.002- CO3 HC01 00013.002- CO4 HC01 00013.002- CO5	7, 7A, 30, 212, 214A	Rooms 3, 5, 5A, 7, 7A, 8, 10, 14A, 15, 16, 20A, 22, 23, 30, 36C, 38A, 101, 101A, 102, 103, 104, 105, 106, 107A, 107B, 107C, 110, 112, 114, 116, 117, 118, 118A, 122, 124, 126, 127, 128, 134, 201, 202, 204, 204A, 205, 209, 210, 211, 211A, 212, 213, 214, 214A, 216, 218, 220, 224, 301, 302, 303, 304, 306, 307, 308, 309, 310, 311, 315, 316, 317, 319, 320, 321, 322, 323, 324, 325, 326, 327, 327A, 328, 329, 330, 331A, 331B, 336, 338, 344, 346, 348, 350, 358, 360, 362, 363, 367, 368	Ceiling plaster - thin white skim coat and thicker grey cementacious underlay	ND
Refer to OESN report[1]	HC03 00013.002- CO9 HC03 00013.002- C10 HC03 00013.002- C11	13, 14	Rooms 13, 14, 30A (1), 38B, 102, 109, 113, 113A, 215	Drywall and Drywall Joint Compound (ceiling)	ND
Refer to OESN report[1]	HC02 00013.002- CO6 HC02 00013.002- CO7 HC02 00013.002- CO8	7	Rooms 7, 19, 306	Ceiling tile (short, deep horizontal holes)	ND
Refer to OESN report[1]	HC04 00013.002- C12 HC04 00013.002- C13 HC04 00013.002- C14	13A	Rooms 13A, 301, 302, 303, 304, 304A, 306, 307, 308, 308A, 309, 311, 315, 316, 317, 319, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331A, 331B, 333, 334, 336, 338, 340, 342, 342A, 344, 346, 348, 350, 352, 353, 354, 355, 356, 358, 360, 362, 363, 364, 366	Ceiling tile (long, wavy, deep holes)	ND
Refer to OESN report[1]	00012.0002- T10 00012.0002- T11 00012.0002- T12	2	-	Paper insulation around pipes - light brown with dimples on drain pipes	ND

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Photo	Sample No.	Sample Room #	Other Rooms with Same Material	Material Type and Description	Results
Refer to OESN report[1]	00012.0002- T19 00012.0002- T20 00012.0002- T21	23	Above metal pan ceiling tiles in rooms 23, 40, 117, 212	Paper backing behind metal pan ceiling tiles - found above the 12" x 12" metal pan drop ceiling	ND
Refer to OESN report[1]	00012.0002- T22 00012.0002- T23 00012.0002- T24	118A	Rooms 118A, 214A, 305	Pressed cardboard (air cell) - light brown with a think layer of tar paper	<0.5%
Refer to OESN report[1]	HM-02 00013.002-M04 HM-02 00013.002-M05 HM-02 00013.002-M06	103	Rooms 40, 103, 306	Mastic on concrete deck - black, sticky mastic	ND
Refer to OESN report[1]	HM-04 00013.002-M11 HM-04 00013.002-M12 HM-05 00013.002-M13	305	Rooms 305B/305C	Mastic on fibreboard - dark brown "pucks"	ND

ND = none detected; below the method detection limit of 0.5 per cent asbestos by dry weight.

[1] Ontario Environmental & Safety Network Ltd. report "Massey Hall Library Offices (R13) Limited Designated Substances and Hazardous Materials Surveys - Phase II

VFT = vinyl floor tile

VFS = vinyl floor sheeting

Table 3: Paint Results for Lead, Leachable Lead, Arsenic, Chromium and Mercury – Massey Hall Library– May 4-6, 2015

Photo	Sample No.	Sample Room #	Other Rooms with Same Material	Description (colour)	Estimated Quantity	Lead Content[1] (90 µg/g)	Lead Leachate (5 mg/L)	Arsenic Content (50 µg/g)	Chromium Content (500 µg/g)	Mercury Content (10 µg/g)	PCBs (50 µg/g)
Refer to OESN report[1]	00013.002-PB17	104	18, 20, 20A, 22, 23, 25, 25A, 26, 30, 30A (2), 38A, 38B, 101, 101A, 102, 103, 104, 105, 106, 107A, 107B, 107C, 110, 112, 114, 117, 118, 122, 124, 126, 127, 128, 205, 207, 209, 211, 212, 213, **216,** 218, **220**, 367 (room numbers in **bold** have paint in poor condition)	Sage green (PB17) on concrete block, wood, plaster, metal, drywall, wallpaper	24,982 ft2	1,150	-	<MDL	<MDL	<MDL	<MDL
	P01	23		Sage green (PB17), bright yellow (PB16), tan (PB19)		-	<0.05	-	-	-	-
Refer to OESN report[1]	00013.002-PB12	7 A (door)	N/A	White (PB12)	Not quantified	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
	P02	23		White (PB12), dusty rose (PB11), red (PB07)	N/A	-	0.23	-	-	-	-
Refer to OESN report[1]	00013.002-PB11	2A	1, 3, 4, 5, 5A, 7, 8, 10, 11, 12, 13, 13A, 14, 14A, 15, 16, 17, 19, 21, 25A, 30A (1), 30A (2), 36C, 37, 38, 40, 113, 116, 125, 134, 135, 204A, 214A, 217, 224, 225, 312, 332, 334, 352, 353, 355, 356, 363, 368.	Dusty rose (PB11) on wood, metal and concrete	2,407 ft2	7190	-	71	2,010	<MDL	Below criteria
	P03	4 (door frame for room 21)		Dusty rose (PB11), pink		-	1.08	-	-	-	-
	P04	4 (door frame for room 8)	21	Dusty rose (PB11), mint green (PB04)	See above (only underlayer is different)	Same as PB11	0.09	Same as PB11	Same as PB11	Same as PB11	Same as PB11

Table 3: Paint Results for Lead, Leachable Lead, Arsenic, Chromium and Mercury – Massey Hall Library– May 4-6, 2015

Photo	Sample No.	Sample Room #	Other Rooms with Same Material	Description (colour)	Estimated Quantity	Lead Content[1] (90 µg/g)	Lead Leachate (5 mg/L)	Arsenic Content (50 µg/g)	Chromium Content (500 µg/g)	Mercury Content (10 µg/g)	PCBs (50 µg/g)
	P05	7		White (PB12), butter yellow (PB02)	N/A	Same as PB12	<0.05	Same as PB12	Same as PB12	Same as PB12	Same as PB12
Refer to OESN report[1]	00013.002-PB21	215	210	Baby blue (PB21) on wood and metal	570 ft2	1,900	-	<MDL	<MDL	<MDL	<MDL
	P06	215		Baby blue (PB21), tan (PB19), dusty rose (PB11)		-	1.12	-	-	-	-
Refer to OESN report[1]	00013.002-PB18	215	36C, 134, 215, 224, 368	Light blue (PB18) on metal, drywall, plaster	570 ft2	3,580	-	<MDL	601	<MDL	<MDL
	P07	215		Light blue (PB18), butter yellow (PB02)		-	0.3	-	-	-	-
Refer to OESN report[1]	00013.002-PB19	304A	224, 302, 303, 304, 304A, 306, 308A, 309, 310, 313, 313A, 314, 315, 316, 319, 320, 321, 322, 323, 324, 325, 328, 329, 331B, 336, 340, 344, 346, 352, 353, 354, 356, 358, 360, 362, 364, 366, 367, 368, 369	Tan (PB19) on wood and metal	2,448 ft2	924	-	<MDL	<MDL	<MDL	Below criteria
	P08	366		Tan (PB19), dusty rose (PB11)		-	0.53	-	-	-	-

Table 3: Paint Results for Lead, Leachable Lead, Arsenic, Chromium and Mercury – Massey Hall Library– May 4-6, 2015

Photo	Sample No.	Sample Room #	Other Rooms with Same Material	Description (colour)	Estimated Quantity	Lead Content[1] (90 µg/g)	Lead Leachate (5 mg/L)	Arsenic Content (50 µg/g)	Chromium Content (500 µg/g)	Mercury Content (10 µg/g)	PCBs (50 µg/g)
Refer to OESN report[1]	00013.002-PB13	114	**2B**, 2C, 3, 10, 12, 13, 13A, 14, **114**, 211, 301, 302, 303, 304, 304A, 306, 307, 308, 308A, 309, 311, 313B, 315, 316, 317, 319, 320, 321, 322, 324, 325, 326, 327, 327A, 328, 329, 330, 331A, 331B, 333, 336, 338, 340, 342, 344, 346, 348, 350, 352, 356, 358, 360, 362, 364, 366 (room numbers in **bold** have paint in poor condition)	Cream (PB13) on concrete, plaster, drywall, wood, cement board	27,473 ft2	1,630	-	<MDL	<MDL	<MDL	<MDL
	P09	366		Cream (PB13), butter yellow (PB02)		-	<0.05	-	-	-	-
Refer to OESN report[1]	00013.002-PB01	2	**2, 2A**, 2B, 2C, 8 (room numbers in **bold** have paint in poor condition)	Grey (PB01) on concrete and concrete block	1,679 ft2	480	-	<MDL	<MDL	<MDL	Below criteria
Refer to OESN report[1]	00013.002-PB02	2	2, **2A**, 8, 16, 30A (2), 40, 107C, 117, 125, 210, 212, 217, **312**, 313, **314**, 327A, **332**, 334, 353, 354, 355, 369 (room numbers in **bold** have paint in poor condition)	Butter yellow (PB02) on concrete, concrete block, plaster, cement board, drywall, metal and canvas wrap	9,755 ft2	2,200	-	<MDL	549	13	Below criteria
Refer to OESN report[1]	00013.002-PB04	2	2, 11, 12, 21, 108, 116, 117, 118A, 201, 203, 204A, 207, 209, 211, 214, 214A, **217** (room numbers in **bold** have paint in poor condition)	Mint green (PB03) on canvas wrap, metal, wood, plaster, concrete block and drywall	7,142	304	-	<MDL	<MDL	Below criteria	Below criteria
Refer to OESN report[1]	00013.002-PB05	2		Lime green (PB05) on metal and wood	54 ft2	524	-	10200	3,020	12	Below criteria

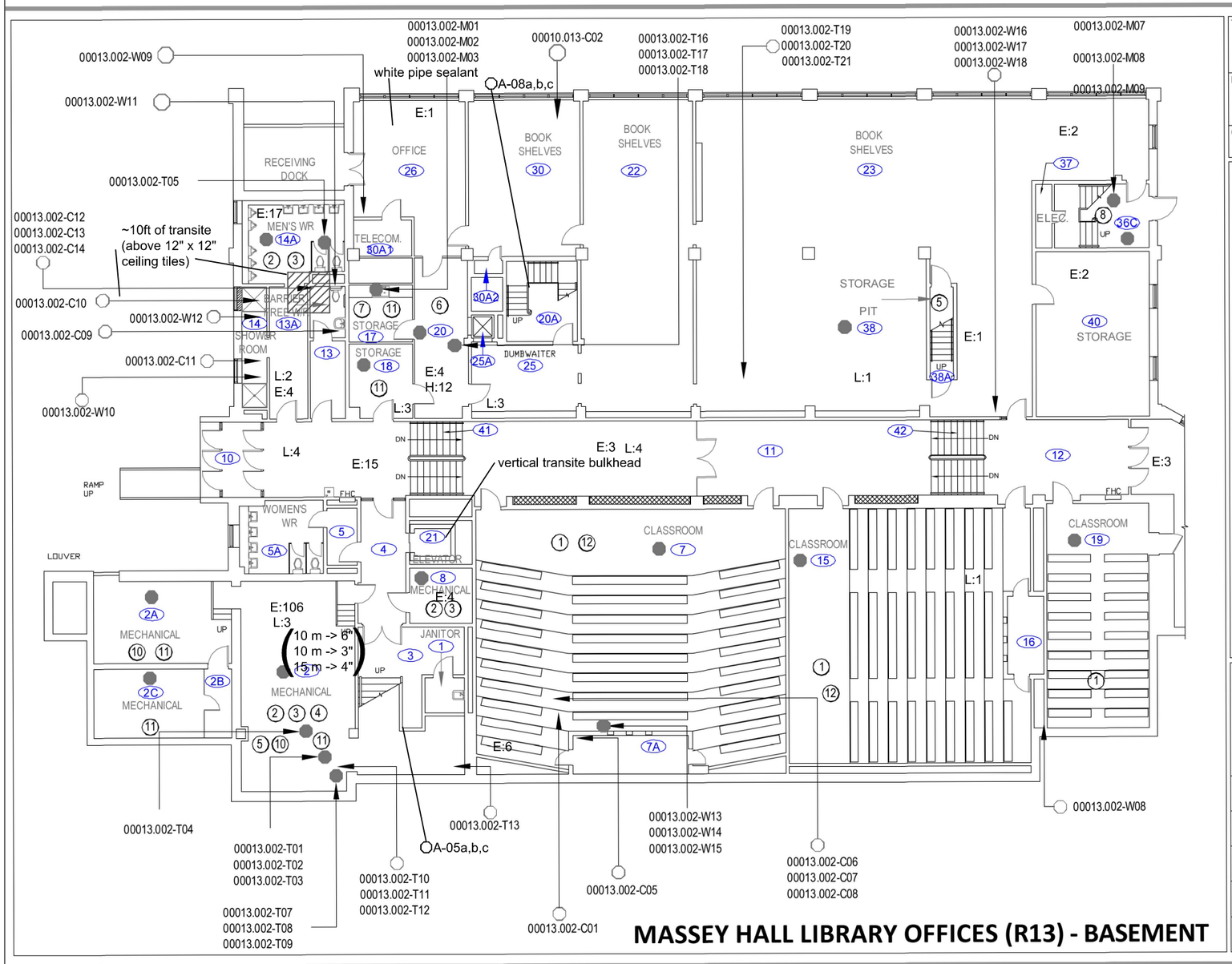
Table 3: Paint Results for Lead, Leachable Lead, Arsenic, Chromium and Mercury – Massey Hall Library– May 4-6, 2015

Photo	Sample No.	Sample Room #	Other Rooms with Same Material	Description (colour)	Estimated Quantity	Lead Content[1] (90 µg/g)	Lead Leachate (5 mg/L)	Arsenic Content (50 µg/g)	Chromium Content (500 µg/g)	Mercury Content (10 µg/g)	PCBs (50 µg/g)
Refer to OESN report[1]	00013.002-PB06	2	2 (fair), 2A (poor), 8, 19	Black (PB06) on metal and wood	213 ft2	1,780	-	<MDL	<MDL	17	Below criteria
Refer to OESN report[1]	00013.002-PB07	2	2, 2A, 10, 12, 19, 23, 30, 117, 122, 205, 212, **214**, 305, 366 (room numbers in **bold** have paint in poor condition)	Red (PB07) on metal	143 ft2	1,830	-	<MDL	<MDL	Below criteria	Below criteria
Refer to OESN report[1]	00013.002-PB08	2	N/A	Royal blue (PB08)	N/A	Below criteria	-	Below criteria	Below criteria	Below criteria	Below criteria
Refer to OESN report[1]	00013.002-PB09	2	**2**, asojdjf	Turquoise/green (PB09)	120 ft2	8,070	-	<MDL	1,950	<MDL	51.4
Refer to OESN report[1]	00013.002-PB10	2A	**2A**, 2B, 2C, 101A, 117, 205, 212 (room numbers in **bold** have paint in poor condition)	Hunter green (PB10) on metal and plaster	1,454 ft2	20400	-	<MDL	4,290	Below criteria	Below criteria
Refer to OESN report[1]	00013.002-PB14	4	N/A	Green (PB14) on plaster	7 ft2	3910	-	<MDL	819	<MDL	<MDL
Refer to OESN report[1]	00013.002-PB15	12	N/A	Chocolate brown (PB15) on metal	84 ft	227	-	<MDL	538	<MDL	<MDL
Refer to OESN report[1]	00013.002-PB16	11	1, 11, 17, 18, 22, 23, 25	Bright yellow (PB16) on concrete and plaster	2,768 ft2	1,950	-	<MDL	506	11	<MDL
Refer to OESN report[1]	00013.002-PB20	305	305, 305B, 305C, 313	Grey (PB20) on concrete, and brick	1,964	1,160	-	<MDL	<MDL	<MDL	Below criteria

[1] Ontario Environmental & Safety Network Ltd. report "Massey Hall Library Offices (R13) Limited Designated Substances and Hazardous
Lead-containing material is defined by the Surface Coating Materials Regulations (SOR/2005-109) as 90 µg/g (µg/g = mg/kg = ppm).
Note that colours may be appear differently on computer monitor.
Analytical results: * No current regulated amount, any concentration above detection limit highlighted. ^SOR/2005-109 Surface Coating Materials Regulations. "SOR/2008-273 PCB Regulation, Ontario Regulation 558/00

APPENDIX B

Site Plans Identifying Asbestos and Lead Paint Results



MASSEY HALL LIBRARY OFFICES (R13) - BASEMENT

Title:
LIMITED DESIGNATED SUBSTANCE AND HAZARDOUS MATERIAL SURVEYS PHASE II

Location:
MASSEY HALL LIBRARY OFFICES (R13)

Customer:
DEFENCE CONSTRUCTION CANADA

ASBESTOS LOCATION LEGEND

1. CEMENT BOARD WALL (HW-03)
2. CEMENT FITTING DOMESTIC HOT WATER (HT-01)
3. CEMENT FITTING DOMESTIC COLD WATER (HT-02)
4. CEMENT PARGING (HT-03)
5. PARGING ALONG LINEAR LENGTH OF PIPING (HT-05)
6. PARGING ON HANGERS - LARGE DRAIN (HT-06)
7. SINK GLAZING - (UNDERLINING) (HM-01)
8. PAPER LIGHT SHIELD (HM-03)
10. FIRE DOOR INSULATION (ASSUMED ACM)
11. PAPER LIGHT GASKET (ASSUMED ACM)
12. GREEN CHALKBOARD (ASSUMED ACM)

SAMPLE LOCATIONS LEGEND

00013.002-C01 ASBESTOS BULK SAMPLE NUMBER

ASBESTOS-CONTAINING SAMPLE

NON ASBESTOS-CONTAINING SAMPLE

NOTE:
C - Ceiling materials - plaster, drywall, drywall compound.
W - Wall materials - plaster, drywall, drywall compound, tile, cement board, texture coat
T - Thermal materials - cement, parging, paper and card board insulation.
M - Textiles and compound materials - sink glazing, mastic compound, paper and tape.

National Défense
Defence nationale

Drawn by:	Checked by:
T. CORTES	T. McPHERSON

OESN Job No: 00013.002

Scale:	Revision:	Date:
N.T.S.	0	JANUARY 2013

DWG No: R13-KINGSTON-2012-ACM01

ASBESTOS

LEGEND

BLUMETRIC SAMPLE LEGEND

SAMPLE ID	DESCRIPTION	RESULTS (%)
A–05a,b,c	BURGUNDY, BEIGE, TERRAZZO	ND
A–08a,b,c	BURGUNDY, TAN, TERRAZZO	ND

WT: WHITE TAPE ALONG DUCT LENGTHS
E: ASBESTOS MATERIAL FOUND IN ELBOWS. T-JOINTS, COUPLINGS, HANGERS
L: ALONG PIPE LENGTHS
V: ASBESTOS MATERIAL FOUND IN PIPE VOIDS
H: ASBESTOS CONTAINING MATERIALS WHERE HANGERS ARE FOUND

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

0 m 2 m 4 m 6 m 8 m 10 m

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT

DEFENCE CONSTRUCTION CANADA

PROJECT

DEFENCE CONSTRUCTION CANADA
MASSEY LIBRARY
DESIGNATED SUBSTANCE SURVEY

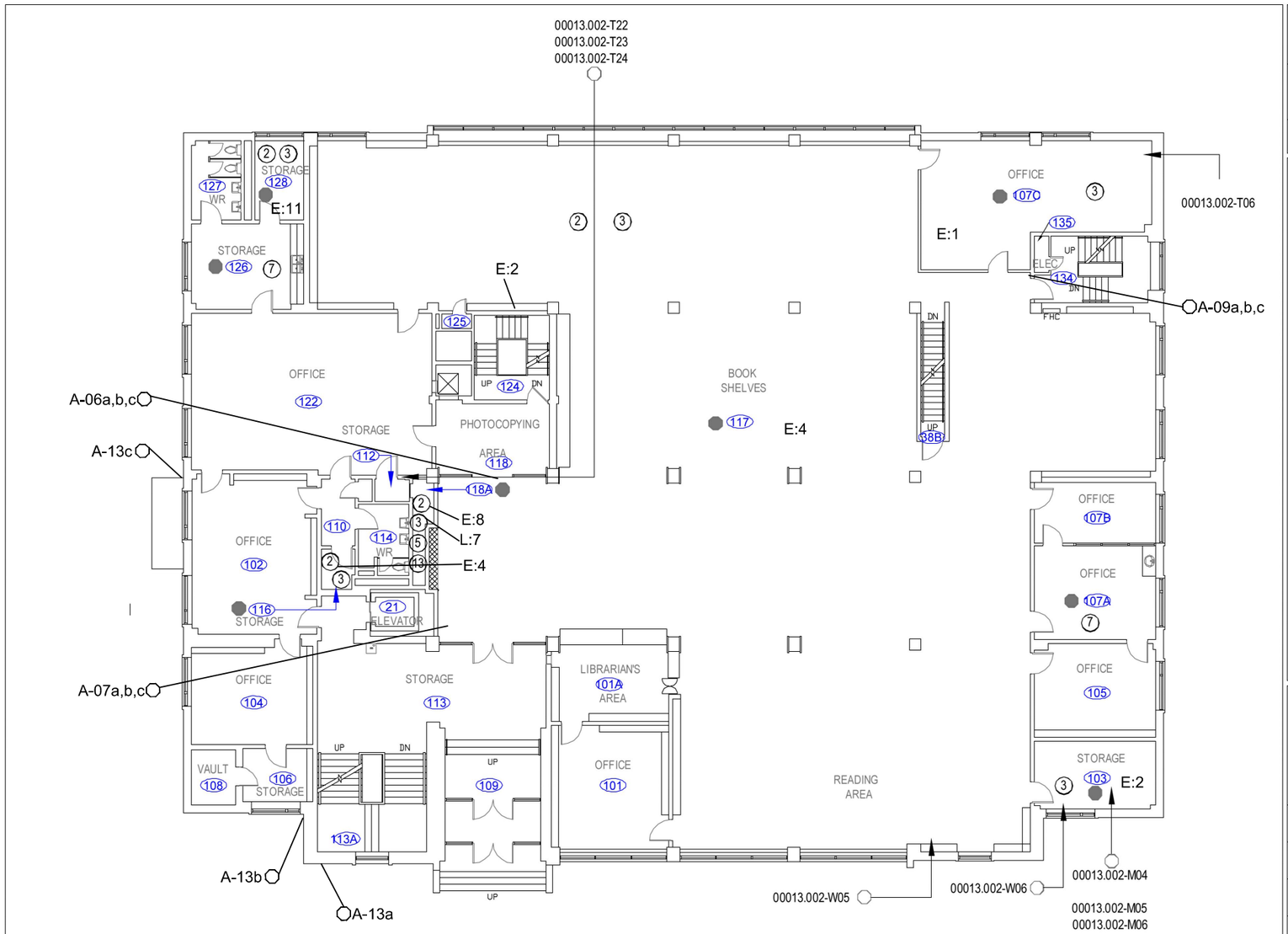
TITLE

ASBESTOS LOCATIONS
BASEMENT

BluMetric Environmental
4 Cataraqui Street
Kingston, Ontario K7K 1Z7
TEL: (613) 531–2725 FAX: (613) 531–1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
K-B13279-00-00	2015-06-01

DRAWN	CHECKED	DWG NO.	REV
KC	VM	1	0



MASSEY HALL LIBRARY OFFICES (R13) - FIRST FLOOR

Title:
LIMITED DESIGNATED SUBSTANCE AND HAZARDOUS MATERIAL SURVEYS PHASE II

Location:
MASSEY HALL LIBRARY OFFICES (R13)

Customer:
DEFENCE CONSTRUCTION CANADA

ASBESTOS LOCATION LEGEND

(2) CEMENT FITTING DOMESTIC HOT WATER (HT-01)

(3) CEMENT FITTING DOMESTIC COLD WATER (HT-02)

(5) PARGING ALONG LINEAR LENGTH OF PIPING (HT-05)

(7) SINK GLAZING - (UNDERLINING) (HM-01)

(13) ACM DEBRIS AT FLOOR LEVEL

SAMPLE LOCATIONS LEGEND

00013.002-C01 ASBESTOS BULK SAMPLE NUMBER

ASBESTOS-CONTAINING SAMPLE

NON ASBESTOS-CONTAINING SAMPLE

NOTE:
C - Ceiling materials - plaster, drywall, drywall compound.
W - Wall materials - plaster, drywall, drywall compound, tile, cement board, texture coat
T - Thermal materials - cement, parging, paper and card board insulation.
M - Textiles and compound materials - sink glazing, mastic compound, paper and tape.

National Défense
Defence nationale

ONTARIO ENVIRONMENTAL & SAFETY NETWORK — OESN Est. 1995

Drawn by:	Checked by:
T. CORTES	T. McPHERSON

OESN Job No: 00013.002

Scale:	Revision:	Date:
N.T.S.	0	JANUARY 2013

DWG No: R13-KINGSTON-2012-ACM02

ASBESTOS

LEGEND

BLUMETRIC SAMPLE LEGEND

SAMPLE ID	DESCRIPTION	RESULTS (%)
A–06a,b,c	VFT/MASTIC (GREEN)	ND
A–07a,b,c	VFT/MASTIC (BEIGE)	ND
A–09a,b,c	VFT/MASTIC (WHITE/GRAY/ BEIGE)	ND
A–13a,b,c	MORTAR	ND

WT: WHITE TAPE ALONG DUCT LENGTHS
E: ASBESTOS MATERIAL FOUND IN ELBOWS. T-JOINTS, COUPLINGS, HANGERS
L: ALONG PIPE LENGTHS
V: ASBESTOS MATERIAL FOUND IN PIPE VOIDS
H: ASBESTOS CONTAINING MATERIALS WHERE HANGERS ARE FOUND

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

0 m 2 m 4 m 6 m 8 m 10 m

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT

DEFENCE CONSTRUCTION CANADA

PROJECT

DEFENCE CONSTRUCTION CANADA
MASSEY LIBRARY
DESIGNATED SUBSTANCE SURVEY

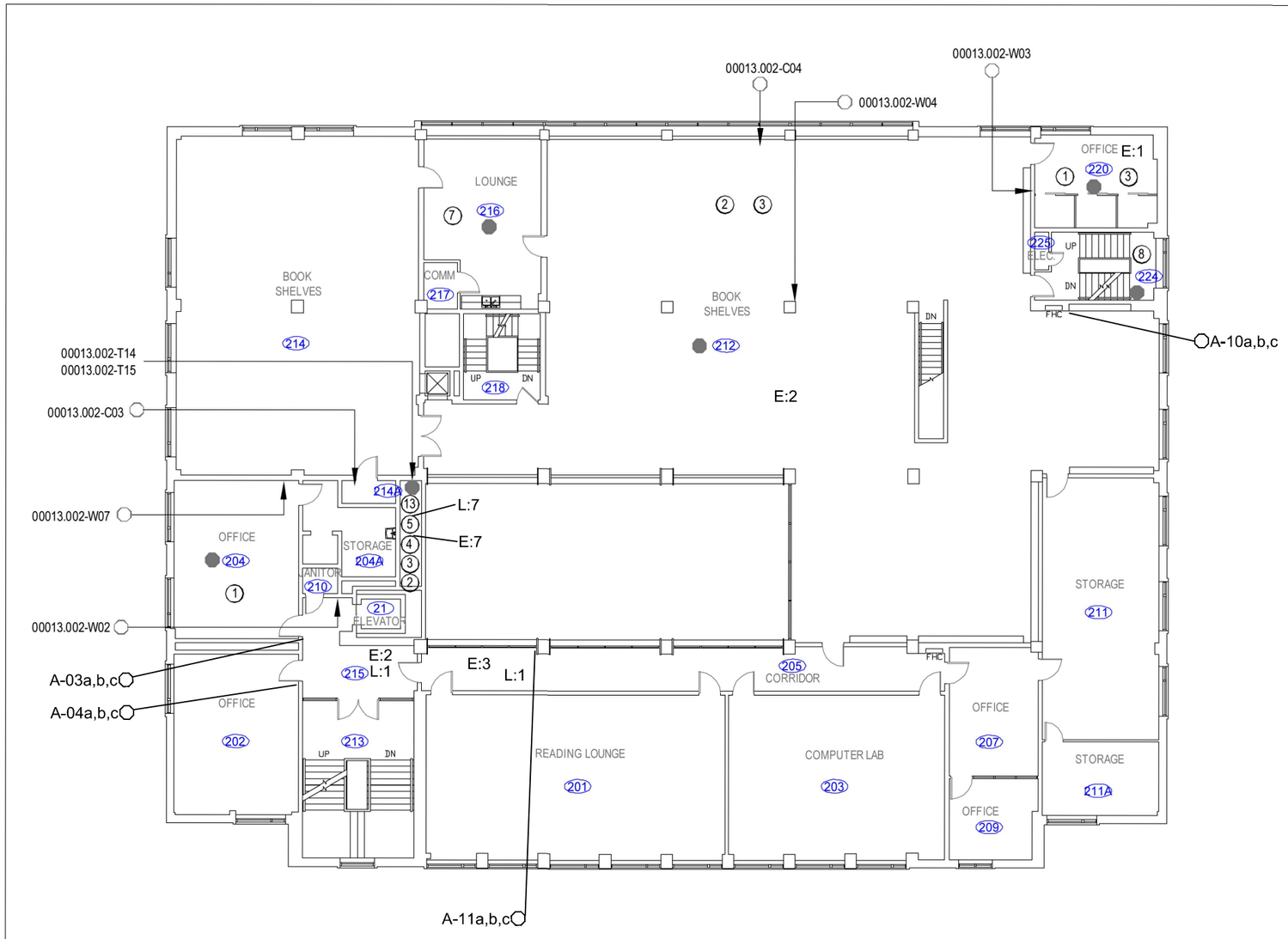
TITLE

ASBESTOS LOCATIONS
FIRST FLOOR

BluMetric Environmental
4 Cataraqui Street
Kingston, Ontario K7K 1Z7
TEL: (613) 531–2725 FAX: (613) 531–1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
K-B13279-00-00	2015-06-01

DRAWN	CHECKED	DWG NO.	REV
KC	VM	2	0



MASSEY HALL LIBRARY OFFICES (R13) - SECOND FLOOR

Title:
LIMITED DESIGNATED SUBSTANCE AND HAZARDOUS MATERIAL SURVEYS PHASE II

Location:
MASSEY HALL LIBRARY OFFICES (R13)

Customer:
DEFENCE CONSTRUCTION CANADA

ASBESTOS LOCATION LEGEND

1. CEMENT BOARD WALL (HW-03)
2. CEMENT FITTING DOMESTIC HOT WATER (HT-01)
3. CEMENT FITTING DOMESTIC COLD WATER (HT-02)
4. CEMENT PARGING (HT-03)
5. PARGING ALONG LINEAR LENGTH OF PIPING (HT-05)
7. SINK GLAZING - (UNDERLINING) (HM-01)
8. PAPER LIGHT SHIELD (HM-03)
13. ACM DEBRIS AT FLOOR LEVEL

SAMPLE LOCATIONS LEGEND

00013.002-C01 ASBESTOS BULK SAMPLE NUMBER

ASBESTOS-CONTAINING SAMPLE

NON ASBESTOS-CONTAINING SAMPLE

NOTE:
C - Ceiling materials - plaster, drywall, drywall compound.
W - Wall materials - plaster, drywall, drywall compound, tile, cement board, texture coat
T - Thermal materials - cement, parging, paper and card board insulation.
M - Textiles and compound materials - sink glazing, mastic compound, paper and tape.

National Défense
Defence nationale

Drawn by:	Checked by:
T. CORTES	T. McPHERSON

OESN Job No: 00013.002

Scale:	Revision:	Date:
N.T.S.	0	JANUARY 2013

DWG No: R13-KINGSTON-2012-ACM03

ASBESTOS

LEGEND

BLUMETRIC SAMPLE LEGEND

SAMPLE ID	DESCRIPTION	RESULTS (%)
A–03a,b,c	VFT/MASTIC (YELLOW/BLUE)	ND
A–04a,b,c	VFT/MASTIC (GRAY/BEIGE)	ND
A–10a,b,c	VFT/MASTIC (BEIGE)	ND

WT: WHITE TAPE ALONG DUCT LENGTHS
E: ASBESTOS MATERIAL FOUND IN ELBOWS. T-JOINTS, COUPLINGS, HANGERS
L: ALONG PIPE LENGTHS
V: ASBESTOS MATERIAL FOUND IN PIPE VOIDS
H: ASBESTOS CONTAINING MATERIALS WHERE HANGERS ARE FOUND

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

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0 m 2 m 4 m 6 m 8 m 10 m

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT

DEFENCE CONSTRUCTION CANADA

PROJECT

DEFENCE CONSTRUCTION CANADA
MASSEY LIBRARY
DESIGNATED SUBSTANCE SURVEY

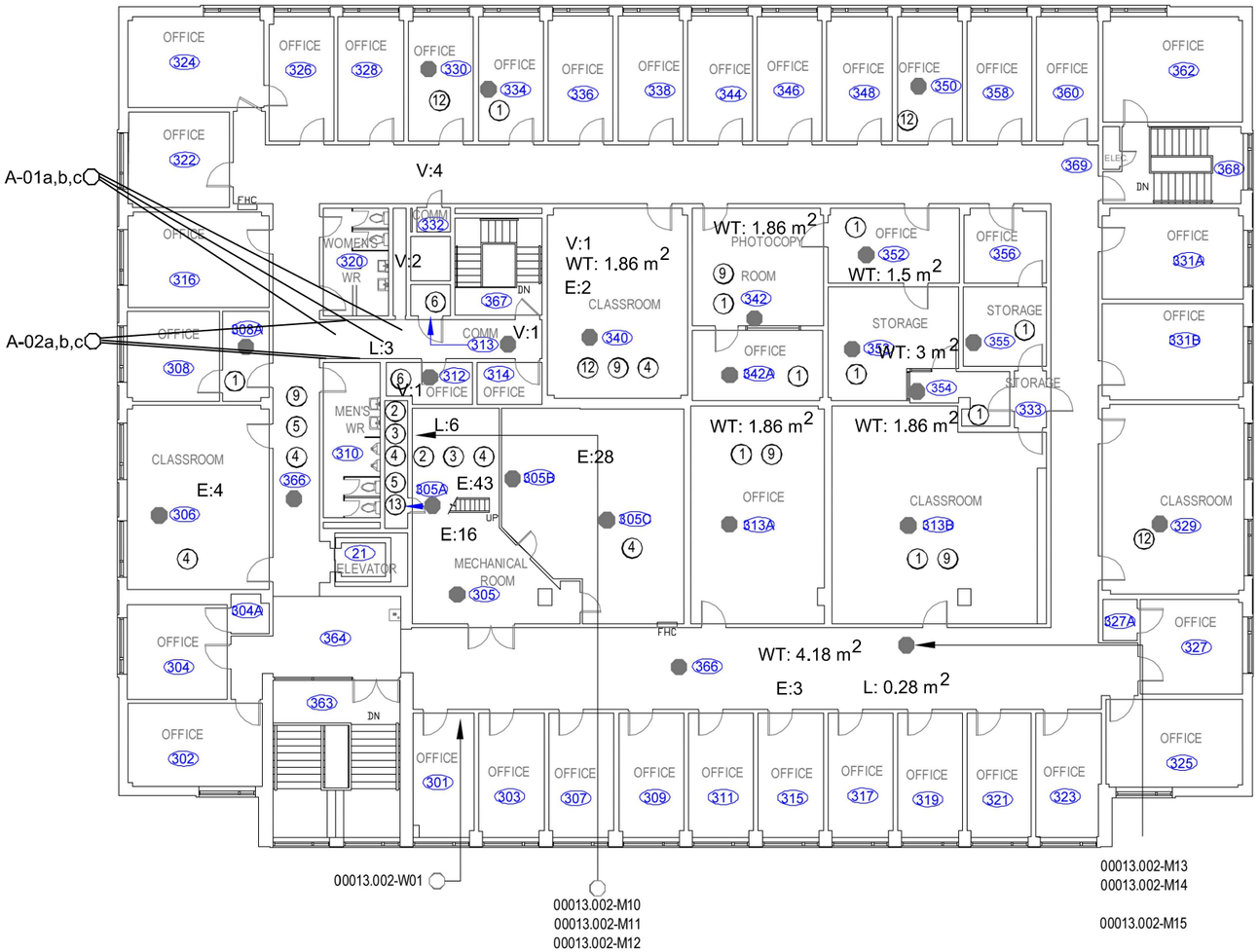
TITLE

ASBESTOS LOCATIONS
SECOND FLOOR

BluMetric Environmental
4 Cataraqui Street
Kingston, Ontario K7K 1Z7
TEL: (613) 531–2725 FAX: (613) 531–1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
K-B13279-00-00	2015-06-01

DRAWN	CHECKED	DWG NO.	REV
KC	VM	3	0



MASSEY HALL LIBRARY OFFICES (R13) - THIRD FLOOR

Title:
LIMITED DESIGNATED SUBSTANCE AND HAZARDOUS MATERIAL SURVEYS PHASE II

Location:
MASSEY HALL LIBRARY OFFICES (R13)

Customer:
DEFENCE CONSTRUCTION CANADA

ASBESTOS LOCATION LEGEND

1. CEMENT BOARD WALL (HW-03)
2. CEMENT FITTING DOMESTIC HOT WATER (HT-01)
3. CEMENT FITTING DOMESTIC COLD WATER (HT-02)
4. CEMENT PARGING (HT-03)
5. PARGING ALONG LINEAR LENGTH OF PIPING (HT-05)
6. PARGING ON HANGERS - LARGE DRAIN (HT-06)
9. WHITE TAPE (HM-05)
12. GREEN CHALKBOARD (ASSUMED ACM)
13. ACM DEBRIS AT FLOOR LEVEL

SAMPLE LOCATIONS LEGEND

00013.002-C01 ASBESTOS BULK SAMPLE NUMBER

ASBESTOS-CONTAINING SAMPLE

NON ASBESTOS-CONTAINING SAMPLE

NOTE:
C - Ceiling materials - plaster, drywall, drywall compound.
W - Wall materials - plaster, drywall, drywall compound, tile, cement board, texture coat
T - Thermal materials - cement, parging, paper and card board insulation.
M - Textiles and compound materials - sink glazing, mastic compound, paper and tape.

National Défense
Defence nationale

OESN EST. 1996 ONTARIO ENVIRONMENTAL & SAFETY NETWORK LTD.

Drawn by: T. CORTES
Checked by: T. McPHERSON
OESN Job No: 00013.002
Scale: N.T.S.
Revision: 0
Date: JANUARY 2013
DWG No: R13-KINGSTON-2012-ACM04

ASBESTOS

LEGEND

BLUMETRIC SAMPLE LEGEND

SAMPLE ID	DESCRIPTION	RESULTS (%)
A–01a,b,c	VFT/MASTIC (BEIGE)	ND
A–02a,b,c	TERRAZZO (GRAY/BEIGE/ BURGUNDY	ND

WT: WHITE TAPE ALONG DUCT LENGTHS
E: ASBESTOS MATERIAL FOUND IN ELBOWS. T-JOINTS, COUPLINGS, HANGERS
L: ALONG PIPE LENGTHS
V: ASBESTOS MATERIAL FOUND IN PIPE VOIDS
H: ASBESTOS CONTAINING MATERIALS WHERE HANGERS ARE FOUND

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

0 m 2 m 4 m 6 m 8 m 10 m

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT

DEFENCE CONSTRUCTION CANADA

PROJECT

DEFENCE CONSTRUCTION CANADA
MASSEY LIBRARY
DESIGNATED SUBSTANCE SURVEY

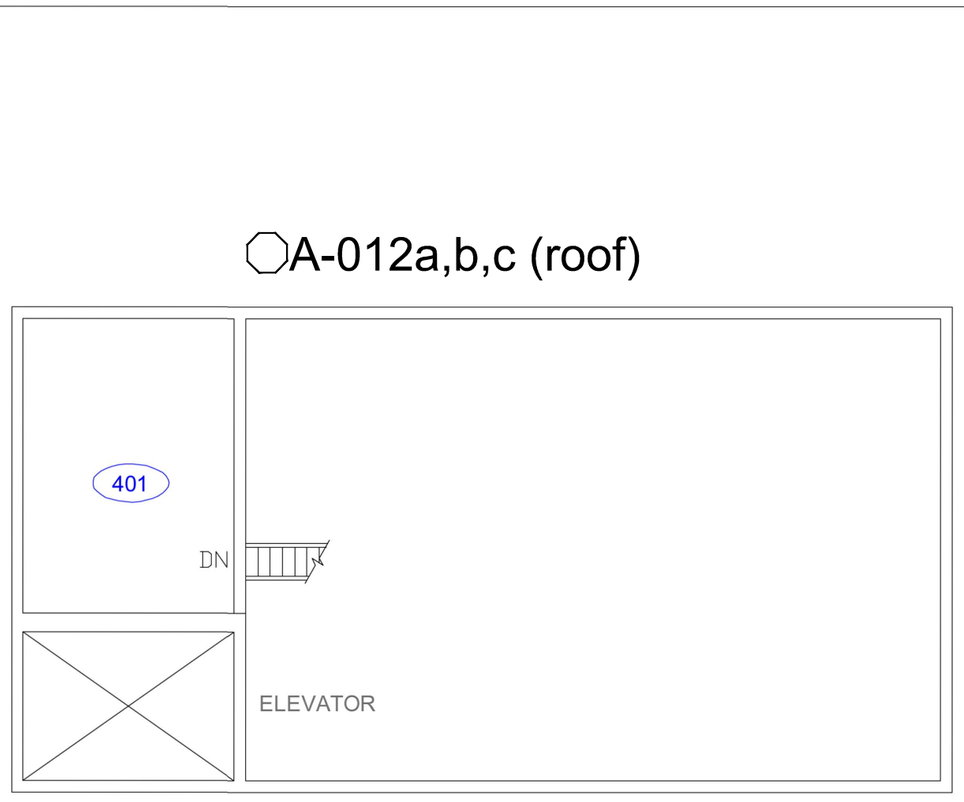
TITLE

ASBESTOS LOCATIONS
THIRD FLOOR

BluMetric Environmental
4 Cataraqui Street
Kingston, Ontario K7K 1Z7
TEL: (613) 531–2725 FAX: (613) 531–1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
K-B13279-00-00	2015-06-01

DRAWN	CHECKED	DWG NO.	REV
KC	VM	4	0



MASSEY HALL LIBRARY OFFICES (R13) - PENTHOUSE

Title:
LIMITED DESIGNATED SUBSTANCE AND HAZARDOUS MATERIAL SURVEYS PHASE II

Location:
MASSEY HALL LIBRARY OFFICES (R13)

Customer:
DEFENCE CONSTRUCTION CANADA

LEGEND

NOTE 1:
Suspect ACM not observed in this room

NOTE 2:
No samples were taken in this space

NOTE 3:
Did not enter/inspect Penthouse

National Défense
Defence nationale

Drawn by:	Checked by:
T. CORTES	T. McPHERSON

OESN Job No: 00013.002

Scale:	Revision:	Date:
N.T.S.	0	JANUARY 2013

DWG No: R13-KINGSTON-2012-ACM05

ASBESTOS

LEGEND

BLUMETRIC SAMPLE LEGEND

SAMPLE ID	DESCRIPTION	RESULTS (%)
A–12a,b,c	ROOFING MATERIAL	ND

WT: WHITE TAPE ALONG DUCT LENGTHS
E: ASBESTOS MATERIAL FOUND IN ELBOWS. T-JOINTS, COUPLINGS, HANGERS
L: ALONG PIPE LENGTHS
V: ASBESTOS MATERIAL FOUND IN PIPE VOIDS
H: ASBESTOS CONTAINING MATERIALS WHERE HANGERS ARE FOUND

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

0 m 1 m 2 m 3 m 4 m 5 m

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT

DEFENCE CONSTRUCTION CANADA

PROJECT

DEFENCE CONSTRUCTION CANADA
MASSEY LIBRARY
DESIGNATED SUBSTANCE SURVEY

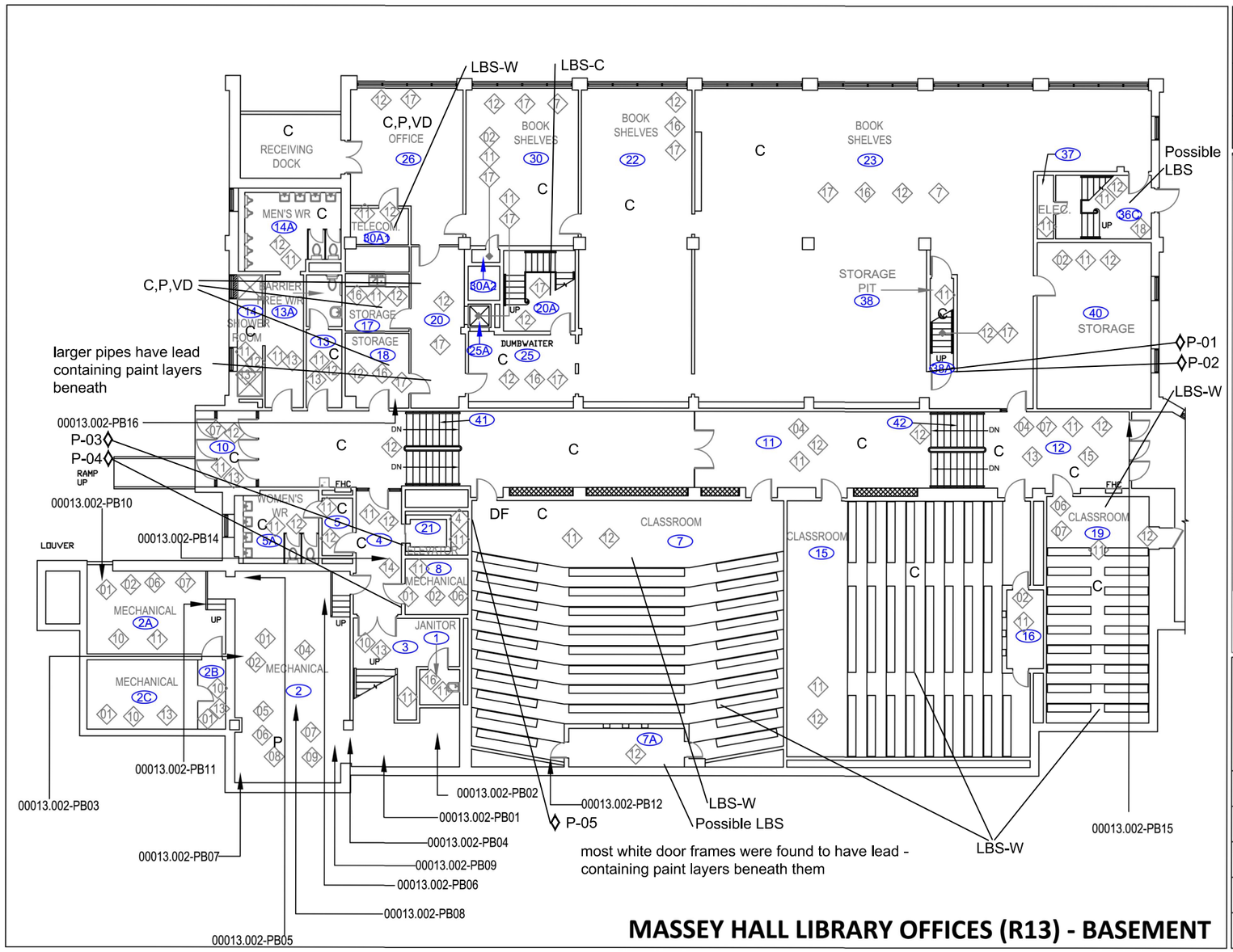
TITLE

ASBESTOS LOCATIONS
PENTHOUSE

BluMetric Environmental
4 Cataraqui Street
Kingston, Ontario K7K 1Z7
TEL: (613) 531–2725 FAX: (613) 531–1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
K-B13279-00-00	2015-06-01

DRAWN	CHECKED	DWG NO.	REV
KC	VM	5	0



MASSEY HALL LIBRARY OFFICES (R13) - BASEMENT

Title:
LIMITED DESIGNATED SUBSTANCE AND HAZARDOUS MATERIAL SURVEYS PHASE II

Location:
MASSEY HALL LIBRARY OFFICES (R13)

Customer:
DEFENCE CONSTRUCTION CANADA

LEGEND

DRAWING PAINT CODE	PAINT COLOUR	ARSENIC CONTENT (µg/g)	CHROMIUM CONTENT (µg/g)	LEAD CONTENT (µg/g)	MERCURY CONTENT (µg/g)	PCBs TOTAL (µg/g)
01	GREY	N1	N1	480	N1	N2
02	BUTTER YELLOW	N1	549	2200	13	N2
04	MINT GREEN	N1	N1	304	N2	N2
05	LIME GREEN	N1	3020	10200	12	N2
06	BLACK	N1	N1	1780	17	N2
07	RED	N1	N1	1830	N2	N2
08	NAVY BLUE	N1	N1	N2	N1	N1
09	TURQUOISE / GREEN	N1	1950	8070	N1	51.4
10	HUNTER GREEN	N1	4290	20400	N2	N2
11	DUSTY ROSE	71	2010	7190	N1	N2
12	WHITE	N1	N1	N2	N1	N1
13	CREAM	N1	N1	1630	N1	N1
14	GREEN	N1	819	3910	N1	N1
15	CHOCOLATE BROWN	N1	538	227	N1	N1
16	BRIGHT YELLOW	N1	506	1950	11	N1
17	SAGE GREEN	N1	N1	1150	N1	N1
18	LIGHT BLUE	N1	601	3580	N1	N1
19	TAN	N1	N1	924	N1	N2
20	GREY	N1	N1	1160	N1	N2
21	BABY BLUE	N1	N1	1900	N1	N1

TABLE NOTE:
N1 Below Method of Analytical Detection (MDL)
N2 Below regulated limit

National Défense
Defence nationale

Drawn by: T. CORTES
Checked by: T. McPHERSON
OESN Job No: 00013.002
Scale: N.T.S.
Revision: 0
Date: JANUARY 2013
DWG No: R13-KINGSTON-2012-SCL01

SURFACE COATINGS LOCATIONS

LEGEND

BLUMETRIC PAINT SAMPLE LEGEND

PAINT SAMPLE ID	PAINT DESCRIPTION	LEAD LEACHATE RESULTS (mg/L)
P-01	SAGE GREEN, BRIGHT YELLOW TAN	< 0.05
P-02	WHITE, DUSTY ROSE, RED	0.23
P-03	DUSTY ROSE, PINK	1.08
P-04	DUSTY ROSE, MINT GREEN	0.09
P-05	WHITE, BUTTER YELLOW	< 0.05

THE FOLLOWING INDICATES PAINTED SURFACE THAT DO NOT CONTAIN LEAD PAINT (UNLESS INDICATED LBS):

R: RAILS
RAD: RADIATOR
C: CEILING (MAY HAVE LBS)
W: WALLS
VD: VENT DUCTS
DF: DOOR FRAME
LBS: LEAD CONTAINING PAINT LAYERS BENEATH WHITE (NON-LEAD CONTAINING) PAINT LAYER

NOTE: ALL PAINTED SURFACES MUST BE TREATED AS LEAD-CONTAINING UNLESS CONFIRMED THAT THERE ARE NO OTHER LAYERS BENEATH WHITE PAINTED SURFACES (◊)

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

0 m 2 m 4 m 6 m 8 m 10 m

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT

DEFENCE CONSTRUCTION CANADA

PROJECT

DEFENCE CONSTRUCTION CANADA
MASSEY LIBRARY
DESIGNATED SUBSTANCE SURVEY

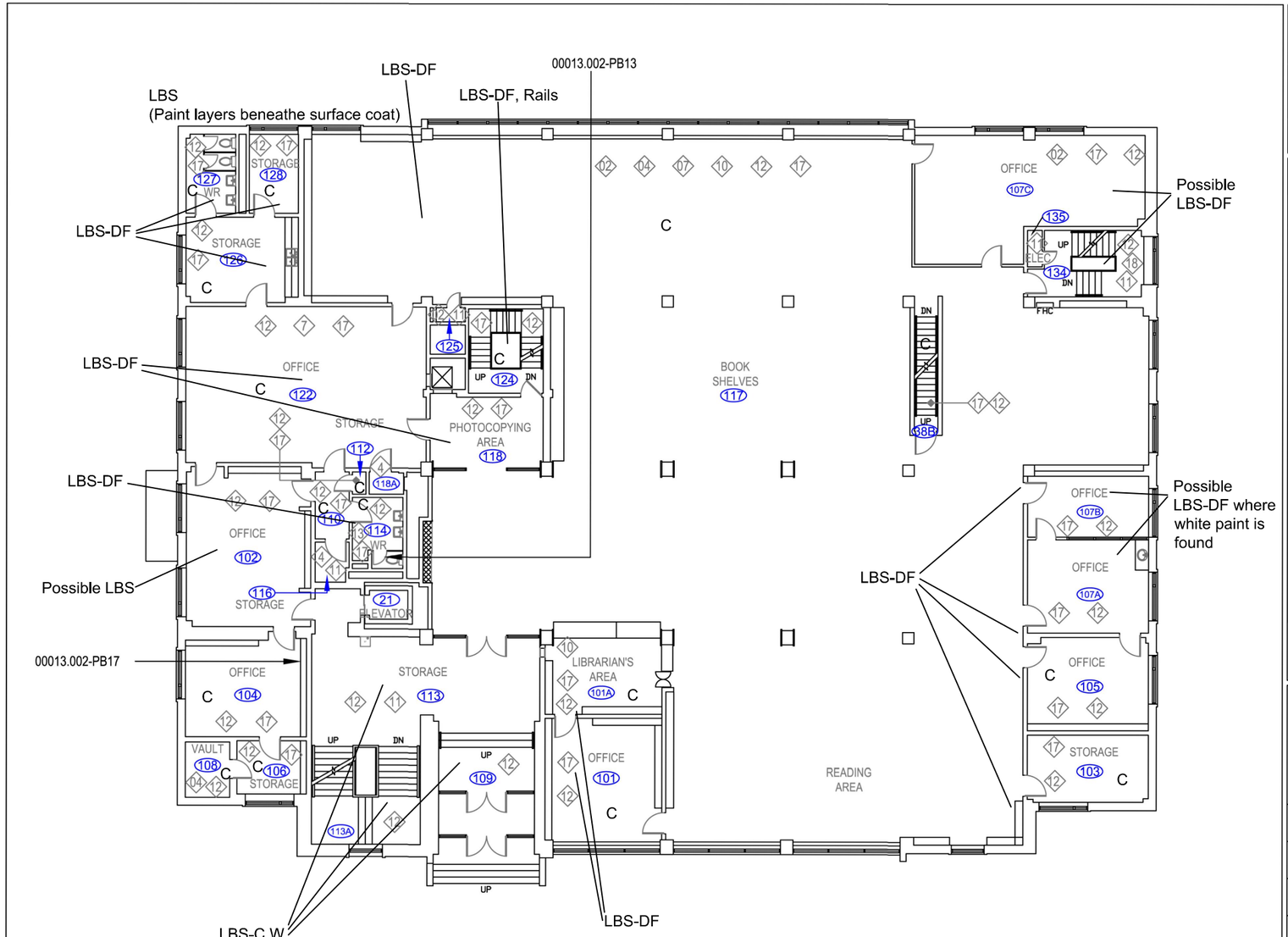
TITLE

PAINT SAMPLE LOCATIONS
BASEMENT

BluMetric Environmental
4 Cataraqui Street
Kingston, Ontario K7K 1Z7
TEL: (613) 531-2725 FAX: (613) 531-1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
K-B13279-00-00	2015-06-01

DRAWN	CHECKED	DWG NO.	REV
KC	VM	6	0



MASSEY HALL LIBRARY OFFICES (R13) - FIRST FLOOR

Title:
LIMITED DESIGNATED SUBSTANCE AND HAZARDOUS MATERIAL SURVEYS PHASE II

Location:
MASSEY HALL LIBRARY OFFICES (R13)

Customer:
DEFENCE CONSTRUCTION CANADA

LEGEND

DRAWING PAINT CODE	PAINT COLOUR	ARSENIC CONTENT (µg/g)	CHROMIUM CONTENT (µg/g)	LEAD CONTENT (µg/g)	MERCURY CONTENT (µg/g)	PCBs TOTAL (µg/g)
01	GREY	N1	N1	480	N1	N2
02	BUTTER YELLOW	N1	549	2200	13	N2
04	MINT GREEN	N1	N1	304	N2	N2
05	LIME GREEN	N1	3020	10200	12	N2
06	BLACK	N1	N1	1780	17	N2
07	RED	N1	N1	1830	N2	N2
08	NAVY BLUE	N1	N1	N2	N1	N1
09	TURQUOISE / GREEN	N1	1950	8070	N1	51.4
10	HUNTER GREEN	N1	4290	20400	N2	N2
11	DUSTY ROSE	71	2010	7190	N1	N2
12	WHITE	N1	N1	N2	N1	N1
13	CREAM	N1	N1	1630	N1	N1
14	GREEN	N1	819	3910	N1	N1
15	CHOCOLATE BROWN	N1	538	227	N1	N1
16	BRIGHT YELLOW	N1	506	1950	11	N1
17	SAGE GREEN	N1	N1	1150	N1	N1
18	LIGHT BLUE	N1	601	3580	N1	N1
19	TAN	N1	N1	924	N1	N2
20	GREY	N1	N1	1160	N1	N2
21	BABY BLUE	N1	N1	1900	N1	N1

TABLE NOTE:
N1 Below Method of Analytical Detection (MDL)
N2 Below regulated limit

National Défense
Defence nationale

Drawn by: T. CORTES
Checked by: T. McPHERSON
OESN Job No: 00013.002
Scale: N.T.S.
Revision: 0
Date: JANUARY 2013
DWG No: R13-KINGSTON-2012-SCL02

SURFACE COATINGS LOCATIONS

LEGEND

BLUMETRIC LEGEND

THE FOLLOWING INDICATES PAINTED SURFACE THAT DO NOT CONTAIN LEAD PAINT (UNLESS INDICATED LBS):

R: RAILS
RAD: RADIATOR
C: CEILING (MAY HAVE LBS)
W: WALLS
LBS: LEAD CONTAINING PAINT LAYERS BENEATH WHITE (NON-LEAD CONTAINING) PAINT LAYER
VD: VENT DUCTS
DF: DOOR FRAME

NOTE: ALL PAINTED SURFACES MUST BE TREATED AS LEAD-CONTAINING UNLESS CONFIRMED THAT THERE ARE NO OTHER LAYERS BENEATH WHITE PAINTED SURFACES (◊)

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

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0 m 2 m 4 m 6 m 8 m 10 m

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT

DEFENCE CONSTRUCTION CANADA

PROJECT

DEFENCE CONSTRUCTION CANADA
MASSEY LIBRARY
DESIGNATED SUBSTANCE SURVEY

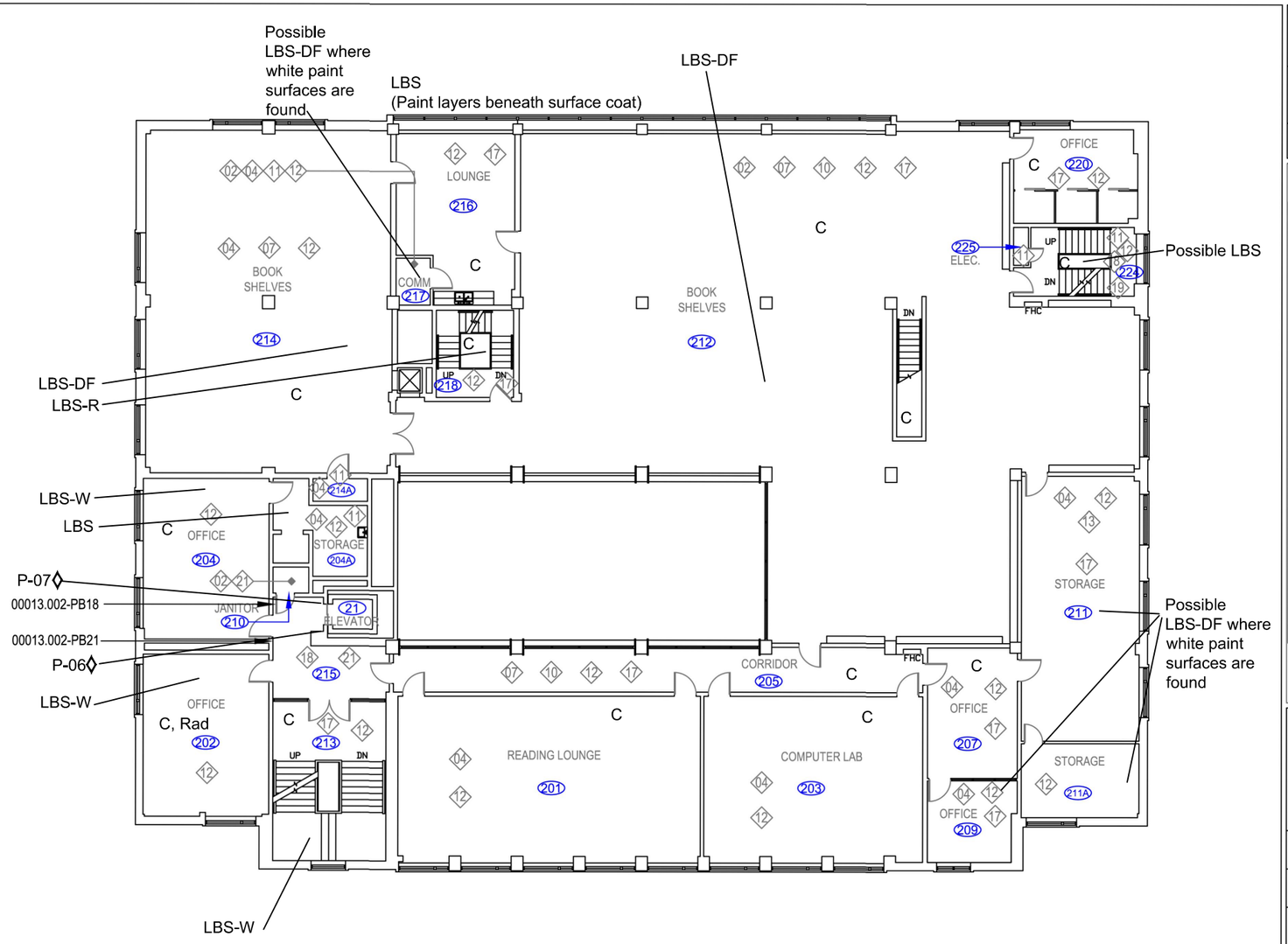
TITLE

PAINT SAMPLE LOCATIONS
FIRST FLOOR

BluMetric Environmental
4 Cataraqui Street
Kingston, Ontario K7K 1Z7
TEL: (613) 531-2725 FAX: (613) 531-1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
K-B13279-00-00	2015-06-01

DRAWN	CHECKED	DWG NO.	REV
KC	VM	7	0



MASSEY HALL LIBRARY OFFICES (R13) - SECOND FLOOR

Title:
LIMITED DESIGNATED SUBSTANCE AND HAZARDOUS MATERIAL SURVEYS PHASE II

Location:
MASSEY HALL LIBRARY OFFICES (R13)

Customer:
DEFENCE CONSTRUCTION CANADA

LEGEND

DRAWING PAINT CODE	PAINT COLOUR	ARSENIC CONTENT (µg/g)	CHROMIUM CONTENT (µg/g)	LEAD CONTENT (µg/g)	MERCURY CONTENT (µg/g)	PCBs TOTAL (µg/g)
01	GREY	N1	N1	480	N1	N2
02	BUTTER YELLOW	N1	549	2200	13	N2
04	MINT GREEN	N1	N1	304	N2	N2
05	LIME GREEN	N1	3020	10200	12	N2
06	BLACK	N1	N1	1780	17	N2
07	RED	N1	N1	1830	N2	N2
08	NAVY BLUE	N1	N1	N2	N1	N1
09	TURQUOISE / GREEN	N1	1950	8070	N1	51.4
10	HUNTER GREEN	N1	4290	20400	N2	N2
11	DUSTY ROSE	71	2010	7190	N1	N2
12	WHITE	N1	N1	N2	N1	N1
13	CREAM	N1	N1	1630	N1	N1
14	GREEN	N1	819	3910	N1	N1
15	CHOCOLATE BROWN	N1	538	227	N1	N1
16	BRIGHT YELLOW	N1	506	1950	11	N1
17	SAGE GREEN	N1	N1	1150	N1	N1
18	LIGHT BLUE	N1	601	3580	N1	N1
19	TAN	N1	N1	924	N1	N2
20	GREY	N1	N1	1160	N1	N2
21	BABY BLUE	N1	N1	1900	N1	N1

TABLE NOTE:
N1 Below Method of Analytical Detection (MDL)
N2 Below regulated limit

National Défense
Defence nationale

Drawn by:	Checked by:
T. CORTES	T. McPHERSON

OESN Job No: 00013.002

Scale:	Revision:	Date:
N.T.S.	0	JANUARY 2013

DWG No: R13-KINGSTON-2012-SCL03

SURFACE COATINGS LOCATIONS

LEGEND

BLUMETRIC PAINT SAMPLE LEGEND

PAINT SAMPLE ID	PAINT DESCRIPTION	LEAD LEACHATE RESULTS (mg/L)
P-06	BABY BLUE, TAN DUSTY ROSE	1.12
P-07	LIGHT BLUE, BUTTER YELLOW	0.30

THE FOLLOWING INDICATES PAINTED SURFACE THAT DO NOT CONTAIN LEAD PAINT (UNLESS INDICATED LBS):

R: RAILS
RAD: RADIATOR
C: CEILING (MAY HAVE LBS)
W: WALLS
LBS: LEAD CONTAINING PAINT LAYERS BENEATH WHITE (NON-LEAD CONTAINING) PAINT LAYER
VD: VENT DUCTS
DF: DOOR FRAME

NOTE: ALL PAINTED SURFACES MUST BE TREATED AS LEAD-CONTAINING UNLESS CONFIRMED THAT THERE ARE NO OTHER LAYERS BENEATH WHITE PAINTED SURFACES (◊)

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES
PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

0 m 2 m 4 m 6 m 8 m 10 m

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT
DEFENCE CONSTRUCTION CANADA

PROJECT
DEFENCE CONSTRUCTION CANADA
MASSEY LIBRARY
DESIGNATED SUBSTANCE SURVEY

TITLE
PAINT SAMPLE LOCATIONS
SECOND FLOOR

BluMetric Environmental
4 Cataraqui Street
Kingston, Ontario K7K 1Z7
TEL: (613) 531-2725 FAX: (613) 531-1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
K-B13279-00-00	2015-06-01

DRAWN	CHECKED	DWG NO.	REV
KC	VM	8	0



MASSEY HALL LIBRARY OFFICES (R13) - THIRD FLOOR

Title:

LIMITED DESIGNATED SUBSTANCE AND HAZARDOUS MATERIAL SURVEYS PHASE II

Location:

MASSEY HALL LIBRARY OFFICES (R13)

Customer:

DEFENCE CONSTRUCTION CANADA

LEGEND

DRAWING PAINT CODE	PAINT COLOUR	ARSENIC CONTENT (µg/g)	CHROMIUM CONTENT (µg/g)	LEAD CONTENT (µg/g)	MERCURY CONTENT (µg/g)	PCBs TOTAL (µg/g)
01	GREY	N1	N1	480	N1	N2
02	BUTTER YELLOW	N1	549	2200	13	N2
04	MINT GREEN	N1	N1	304	N2	N2
05	LIME GREEN	N1	3020	10200	12	N2
06	BLACK	N1	N1	1780	17	N2
07	RED	N1	N1	1830	N2	N2
08	NAVY BLUE	N1	N1	N2	N1	N1
09	TURQUOISE / GREEN	N1	1950	8070	N1	51.4
10	HUNTER GREEN	N1	4290	20400	N2	N2
11	DUSTY ROSE	71	2010	7190	N1	N2
12	WHITE	N1	N1	N2	N1	N1
13	CREAM	N1	N1	1630	N1	N1
14	GREEN	N1	819	3910	N1	N1
15	CHOCOLATE BROWN	N1	538	227	N1	N1
16	BRIGHT YELLOW	N1	506	1950	11	N1
17	SAGE GREEN	N1	N1	1150	N1	N1
18	LIGHT BLUE	N1	601	3580	N1	N1
19	TAN	N1	N1	924	N1	N2
20	GREY	N1	N1	1160	N1	N2
21	BABY BLUE	N1	N1	1900	N1	N1

TABLE NOTE:
N1 Below Method of Analytical Detection (MDL)
N2 Below regulated limit

National Défense
Defence nationale

Drawn by:	Checked by:
T. CORTES	T. McPHERSON

OESN Job No: 00013.002

Scale:	Revision:	Date:
N.T.S.	0	JANUARY 2013

DWG No: R13-KINGSTON-2012-SCL04

SURFACE COATINGS LOCATIONS

LEGEND

BLUMETRIC PAINT SAMPLE LEGEND

PAINT SAMPLE ID	PAINT DESCRIPTION	LEAD LEACHATE RESULTS (mg/L)
P-08	TAN, DUSTY ROSE	0.53
P-09	CREAM, BUTTER YELLOW	< 0.05

THE FOLLOWING INDICATES PAINTED SURFACE THAT DO NOT CONTAIN LEAD PAINT (UNLESS INDICATED LBS):

R: RAILS
RAD: RADIATOR
C: CEILING (MAY HAVE LBS)
W: WALLS
LBS: LEAD CONTAINING PAINT LAYERS BENEATH WHITE (NON-LEAD CONTAINING) PAINT LAYER
VD: VENT DUCTS
DF: DOOR FRAME

NOTE: ALL PAINTED SURFACES MUST BE TREATED AS LEAD-CONTAINING UNLESS CONFIRMED THAT THERE ARE NO OTHER LAYERS BENEATH WHITE PAINTED SURFACES (◊)

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

0 m 2 m 4 m 6 m 8 m 10 m

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT

DEFENCE CONSTRUCTION CANADA

PROJECT

DEFENCE CONSTRUCTION CANADA
MASSEY LIBRARY
DESIGNATED SUBSTANCE SURVEY

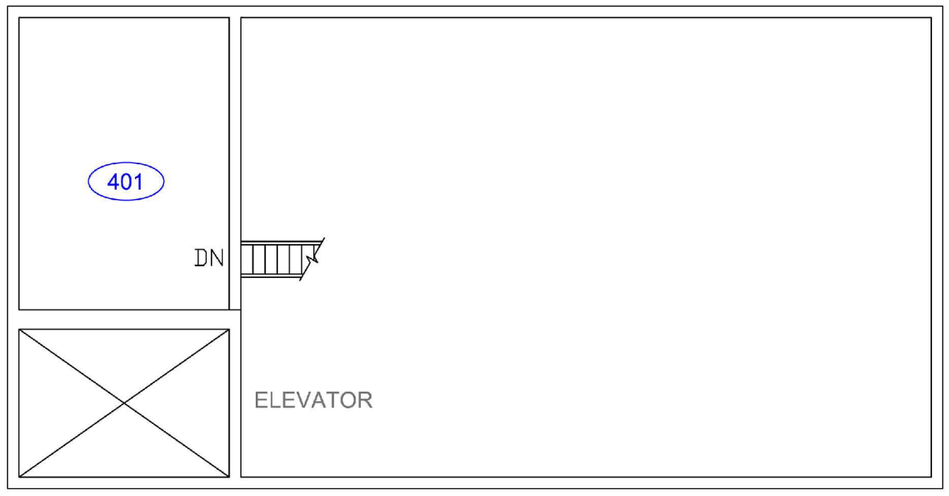
TITLE

PAINT SAMPLE LOCATIONS
THIRD FLOOR

BluMetric Environmental
4 Cataraqui Street
Kingston, Ontario K7K 1Z7
TEL: (613) 531-2725 FAX: (613) 531-1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
K-B13279-00-00	2015-06-01

DRAWN	CHECKED	DWG NO.	REV
KC	VM	9	0



MASSEY HALL LIBRARY OFFICES (R13) - PENTHOUSE

Title:
LIMITED DESIGNATED SUBSTANCE AND HAZARDOUS MATERIAL SURVEYS PHASE II

Location:
MASSEY HALL LIBRARY OFFICES (R13)

Customer:
DEFENCE CONSTRUCTION CANADA

LEGEND

NOTE:
NO PAINT BULK SAMPLES TAKEN IN THIS SPACE

National Défense
Defence nationale

Drawn by:	Checked by:
T. CORTES	T. McPHERSON

OESN Job No: 00013.002

Scale:	Revision:	Date:
N.T.S.	0	JANUARY 2013

DWG No: R13-KINGSTON-2012-SCL05

SURFACE COATINGS LOCATIONS

LEGEND

WT: WHITE TAPE ALONG DUCT LENGTHS
E: ASBESTOS MATERIAL FOUND IN ELBOWS. T-JOINTS, COUPLINGS, HANGERS
L: ALONG PIPE LENGTHS
V: ASBESTOS MATERIAL FOUND IN PIPE VOIDS
H: ASBESTOS CONTAINING MATERIALS WHERE HANGERS ARE FOUND

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

0 m 1 m 2 m 3 m 4 m 5 m

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT

DEFENCE CONSTRUCTION CANADA

PROJECT

DEFENCE CONSTRUCTION CANADA
MASSEY LIBRARY
DESIGNATED SUBSTANCE SURVEY

TITLE

PAINT SAMPLE LOCATIONS
PENTHOUSE

BluMetric Environmental
4 Cataraqui Street
Kingston, Ontario K7K 1Z7
TEL: (613) 531-2725 FAX: (613) 531-1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
K-B13279-00-00	2015-06-01

DRAWN	CHECKED	DWG NO.	REV
KC	VM	10	0

APPENDIX C

Laboratory Reports and
Chain of Custody Records

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300-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
p: 1-800-749-1947
e: paracel@paracellabs.com
www.paracellabs.com

Certificate of Analysis

BluMetric Environmental Inc. (Kingston)

4 Cataraqui St.
Kingson, ON K7K 1Z7
Attn: Veronique Maynard

Phone: (613) 531-2725
Fax: (613) 531-1852

Client PO:
Project: KB13279-00-00
Custody: 9403

Report Date: 13-May-2015
Order Date: 7-May-2015

Order #: 1519278

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

Paracel ID	Client ID
1519278-01	A-01 a
1519278-02	A-01 b
1519278-03	A-01 c
1519278-04	A-02 a
1519278-05	A-02 b
1519278-06	A-02 c
1519278-07	A-03 a
1519278-08	A-03 b
1519278-09	A-03 c
1519278-10	A-04 a
1519278-11	A-04 b
1519278-12	A-04 c
1519278-13	A-05 a
1519278-14	A-05 b
1519278-15	A-05 c
1519278-16	A-06 a
1519278-17	A-06 b
1519278-18	A-06 c
1519278-19	A-07 a
1519278-20	A-07 b
1519278-21	A-07 c
1519278-22	A-08 a
1519278-23	A-08 b
1519278-24	A-08 c
1519278-25	A-09 a
1519278-26	A-09 b
1519278-27	A-09 c
1519278-28	A-10 a
1519278-29	A-10 b
1519278-30	A-10 c
1519278-31	A-11 a
1519278-32	A-11 b
1519278-33	A-11 c
1519278-34	A-12 a
1519278-35	A-12 b
1519278-36	A-12 c
1519278-37	A-13 a
1519278-38	A-13 b
1519278-39	A-13 c

Approved By:



Emma Diaz
Senior Analyst

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

PARACEL LABORATORIES LTD.

Client:	BluMetric Environmental Inc. (Kingston) 4 Cataraqui St. Kingson, ON K7K 1Z7	**Attn:**	Veronique Maynard Tel: (613) 531-2725 Fax: (613) 531-1852
Project:	KB13279-00-00	**Received Date:**	07-May-15
Paracel Report No.:	1519278	**Report Date:**	13-May-15

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

Paracel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1519278-01	06-May-15	Sample homogenized	Beige	Vinyl Sheet Floor/Mastic	No	**Client ID: A-01 a** [AS-PRE]	
						Cellulose	20
						Non-Fibers	80
1519278-02	06-May-15	Sample homogenized	Beige	Vinyl Sheet Floor/Mastic	No	**Client ID: A-01 b** [AS-PRE]	
						Cellulose	20
						Non-Fibers	80
1519278-03	06-May-15	Sample homogenized	Beige	Vinyl Sheet Floor/Mastic	No	**Client ID: A-01 c** [AS-PRE]	
						Cellulose	20
						Non-Fibers	80
1519278-04	06-May-15	Sample homogenized	Grey/Bergundy	Terrazo	No	**Client ID: A-02 a**	
						Non-Fibers	100
1519278-05	06-May-15	Sample homogenized	Beige/Bergundy	Terrazo	No	**Client ID: A-02 b**	
						Non-Fibers	100
1519278-06	06-May-15	Sample homogenized	Beige/Bergundy	Terrazo	No	**Client ID: A-02 c**	
						Non-Fibers	100
1519278-07	06-May-15	Sample homogenized	Yellow/Blue	Vinyl Floor Tile/Mastic	No	**Client ID: A-03 a** [AS-PRE]	
						Non-Fibers	100
1519278-08	06-May-15	Sample homogenized	Yellow/Blue	Vinyl Floor Tile/Mastic	No	**Client ID: A-03 b** [AS-PRE]	
						Non-Fibers	100
1519278-09	06-May-15	Sample homogenized	Yellow/Blue	Vinyl Floor Tile/Mastic	No	**Client ID: A-03 c** [AS-PRE]	
						Non-Fibers	100
1519278-10	06-May-15	Sample homogenized	Grey/Beige	Vinyl Floor Tile/Mastic	No	**Client ID: A-04 a** [AS-PRE]	
						Non-Fibers	100
1519278-11	06-May-15	Sample homogenized	Grey/Beige	Vinyl Floor Tile/Mastic	No	**Client ID: A-04 b** [AS-PRE]	
						Non-Fibers	100
1519278-12	06-May-15	Sample homogenized	Grey/Beige	Vinyl Floor Tile/Mastic	No	**Client ID: A-04 c** [AS-PRE]	
						Non-Fibers	100
1519278-13	06-May-15	Sample homogenized	Beige	Terrazo	No	**Client ID: A-05 a**	
						Non-Fibers	100
1519278-14	06-May-15	Sample homogenized	Beige	Terrazo	No	**Client ID: A-05 b**	
						Non-Fibers	100

PARACEL LABORATORIES LTD.

Client: BluMetric Environmental Inc. (Kingston)
4 Cataraqui St.
Kingson, ON K7K 1Z7

Attn: Veronique Maynard
Tel: (613) 531-2725
Fax: (613) 531-1852

Project: KB13279-00-00
Paracel Report No.: 1519278

Received Date: 07-May-15
Report Date: 13-May-15

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

Paracel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1519278-15	06-May-15	Sample homogenized	Beige	Terrazo	No	**Client ID: A-05 c**	
						Non-Fibers	100
1519278-16	06-May-15	Sample homogenized	Green	Vinyl Floor Tile/Mastic	No	**Client ID: A-06 a** [AS-PRE]	
						Non-Fibers	100
1519278-17	06-May-15	Sample homogenized	Green	Vinyl Floor Tile/Mastic	No	**Client ID: A-06 b** [AS-PRE]	
						Non-Fibers	100
1519278-18	06-May-15	Sample homogenized	Green	Vinyl Floor Tile/Mastic	No	**Client ID: A-06 c** [AS-PRE]	
						Non-Fibers	100
1519278-19	06-May-15	Sample homogenized	Beige	Vinyl Floor Tile/Mastic	No	**Client ID: A-07 a** [AS-PRE]	
						Non-Fibers	100
1519278-20	06-May-15	Sample homogenized	Beige	Vinyl Floor Tile/Mastic	No	**Client ID: A-07 b** [AS-PRE]	
						Non-Fibers	100
1519278-21	06-May-15	Sample homogenized	Beige	Vinyl Floor Tile/Mastic	No	**Client ID: A-07 c** [AS-PRE]	
						Non-Fibers	100
1519278-22	06-May-15	Sample homogenized	Beige	Terrazo	No	**Client ID: A-08 a**	
						Non-Fibers	100
1519278-23	06-May-15	Sample homogenized	Beige	Terrazo	No	**Client ID: A-08 b**	
						Non-Fibers	100
1519278-24	06-May-15	Sample homogenized	Beige	Terrazo	No	**Client ID: A-08 c**	
						Non-Fibers	100
1519278-25	06-May-15	Sample homogenized	White/Grey/Beige	Vinyl Floor Tile/Mastic	No	**Client ID: A-09 a** [AS-PRE]	
						Non-Fibers	100
1519278-26	06-May-15	Sample homogenized	White/Grey/Beige	Vinyl Floor Tile/Mastic	No	**Client ID: A-09 b** [AS-PRE]	
						Non-Fibers	100
1519278-27	06-May-15	Sample homogenized	White/Grey/Beige	Vinyl Floor Tile/Mastic	No	**Client ID: A-09 c** [AS-PRE]	
						Non-Fibers	100
1519278-28	06-May-15	Sample homogenized	Beige	Vinyl Floor Tile/Mastic	No	**Client ID: A-10 a** [AS-PRE]	
						Cellulose	5
						Non-Fibers	95

PARACEL LABORATORIES LTD.

Client: BluMetric Environmental Inc. (Kingston)
4 Cataraqui St.
Kingson, ON K7K 1Z7

Attn: Veronique Maynard
Tel: (613) 531-2725
Fax: (613) 531-1852

Project: KB13279-00-00
Paracel Report No.: 1519278

Received Date: 07-May-15
Report Date: 13-May-15

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

Paracel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1519278-29	06-May-15	Sample homogenized	Beige	Vinyl Floor Tile/Mastic	No	**Client ID: A-10 b** [AS-PRE]	
						Cellulose	5
						Non-Fibers	95
1519278-30	06-May-15	Sample homogenized	Beige	Vinyl Floor Tile/Mastic	No	**Client ID: A-10 c** [AS-PRE]	
						Cellulose	5
						Non-Fibers	95
1519278-31	06-May-15	Sample homogenized	White/Grey	Vinyl Floor Tile/Mastic	No	**Client ID: A-11 a** [AS-PRE]	
						Non-Fibers	100
1519278-32	06-May-15	Sample homogenized	White/Grey	Vinyl Floor Tile/Mastic	No	**Client ID: A-11 b** [AS-PRE]	
						Non-Fibers	100
1519278-33	06-May-15	Sample homogenized	White/Grey	Vinyl Floor Tile/Mastic	No	**Client ID: A-11 c** [AS-PRE]	
						Non-Fibers	100
1519278-34	06-May-15	Sample homogenized	Grey/Black/Red	Roof Tar	No	**Client ID: A-12 a** [AS-PRE]	
						Cellulose	15
						Non-Fibers	85
1519278-35	06-May-15	Sample homogenized	Grey/Black/Red	Roof Tar	No	**Client ID: A-12 b** [AS-PRE]	
						Cellulose	15
						Non-Fibers	85
1519278-36	06-May-15	Sample homogenized	Grey/Black/Red	Roof Tar	No	**Client ID: A-12 c** [AS-PRE]	
						Cellulose	15
						Non-Fibers	85
1519278-37	06-May-15	Sample homogenized	Grey	Mortar	No	**Client ID: A-13 a**	
						Non-Fibers	100
1519278-38	06-May-15	Sample homogenized	Grey	Mortar	No	**Client ID: A-13 b**	
						Non-Fibers	100
1519278-39	06-May-15	Sample homogenized	Grey	Mortar	No	**Client ID: A-13 c**	
						Non-Fibers	100

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.

PARACEL LABORATORIES LTD.

Client:	BluMetric Environmental Inc. (Kingston) 4 Cataraqui St. Kingson, ON K7K 1Z7	**Attn:**	Veronique Maynard Tel: (613) 531-2725 Fax: (613) 531-1852
Project:	KB13279-00-00	**Received Date:**	07-May-15
Paracel Report No.:	1519278	**Report Date:**	13-May-15

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	Mississauga	200863-0	8-May-15

** 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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OTTAWA ◉ KINGSTON ◉ NIAGARA ◉ MISSISSAUGA ◉ SARNIA

Head Office
300-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
p: 1-800-749-1947
e: paracel@paracellabs.com
www.paracel@paracellabs.com

Chain of Custody
(Lab Use Only)
№ 9403

Page 1 of 1

Client Name: BluMetric	Project Reference: KB13279-00-00
Contact Name: V. Maynard.	Quote #:
Address: The Tower, The Woolen Mill, 4 Cataraqui St. Kingston ON K7K 1Z7	PO #:
Telephone: 613-531-2725	Email Address: vmaynard@blumetric.ca kmajor@blumetric.ca.

TAT: [X] Regular [ ] 3 Day [ ] 2 Day [ ] 1 Day [ ] Same Day

Date Required: _____

ASBESTOS ANALYSIS

Matrix: [ ] Air [✓] Other **Regulatory Guideline:** _____

Required Analyses: [ ]PCM [ ]PLM [ ]PLM 400PC [ ]PLM 1000PC [ ]Chatfield [ ]TEM

Paracel Order Number: 1519278

	Sample ID	Matrix Description	Sampling Date	Air Volume (L)	Positive Stop? (Y/N)	Is the Sample Layered? (Y/N)	If layered, Describe Layer(s) to be Analyzed Separately* or Homogenize all **
1	~~A-00 a,b,c~~	~~Tan and beige mix~~	6-May-15	—	~~Y~~		
2	A-01 a,b,c	Tan and beige mix - VFS + mastic		—	Y	Y	Hom ~~Het~~
3	A-02 a,b,c	Brown + burgundy speckles - Terrazo		—	Y	N	
4	A-03 a,b,c	Blue 12x12 with mastic - VFT		—	Y	Y	hom
5	A-04 a,b,c	Light + med grey VFT + mastic		—	Y	Y	hom.
6	A-05 a,b,c	Burgendy, beige terrazo		—	Y	N	
7	A-06 a,b,c	Green 12x12 VFT with mastic		—	Y	Y	hom
8	A-07 a,b,c	Beige VFT with Mastic		—	Y	Y	hom
9	A-08 a,b,c	Light beige + tan terazzo		—	Y	N	~~HOM~~
10	A-09 a,b,c	Tan with grey + white VFT + mastic		—	Y	~~N~~ Y	hom
11	A-10 a,b,c	Tan with dark grey VFT + mastic		—	Y	Y	hom
12	A-11 a,b,c	White, light + dark grey VFT + mastic		—	Y	Y	hom
13	A-12 a,b,c	Roof tar Sheeting		—	Y	N	
14	A-13 a,b,c	Mortar		—	Y	Y	hom.
15							

* Each layer is charged as a separate analysis ** Homogenize = Sample is combined to a uniform mixture

Comments: Regular TAT

Method of Delivery: pick-up.

Relinquished By (Sign):	Received at Depot:	Received at Lab:	Verified By:
Relinquished By (Print): V Maynard			
Date/Time: May 6, 2015	Date/Time: May 7 12:05	Date/Time: 08-MAY-15 9:45	Date/Time: 08-MAY-15 9:45

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e: paracel@paracellabs.com
www.paracellabs.com

Certificate of Analysis

BluMetric Environmental Inc. (Kingston)
4 Cataraqui St.
Kingson, ON K7K 1Z7
Attn: Veronique Maynard

Phone: (613) 531-2725
Fax: (613) 531-1852

Client PO:
Project: KB-13279-00-00
Custody:

Report Date: 13-May-2015
Order Date: 7-May-2015
Order #: 1519289

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

Paracel ID	Client ID
1519289-01	P01 - Sage green, bright yellow, tan
1519289-02	P02 - White, dusty rose, red
1519289-03	P03 - Dusty rose, pink
1519289-04	P04 - Dusty rose, mint green
1519289-05	P05 - White, butter yellow
1519289-06	P06 - Baby blue, tan, dusty rose
1519289-07	P07 - Light blue, butter yellow
1519289-08	P08 - Tan, dusty rose
1519289-09	P09 - Cream, butter yellow

Approved By: 

Mark Foto, M.Sc. For Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty 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

Certificate of Analysis

Report Date: 13-May-2015
Order Date:7-May-2015

Client: **BluMetric Environmental Inc. (Kingston)**
Client PO: Project Description: KB-13279-00-00

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-MS	EPA 6020 - ICP-MS, digestion	13-May-15	13-May-15
Solids, %	Gravimetric, calculation	7-May-15	7-May-15

Certificate of Analysis

Report Date: 13-May-2015
Order Date:7-May-2015

Client: **BluMetric Environmental Inc. (Kingston)**
Client PO:

Project Description: KB-13279-00-00

	Client ID:	P01 - Sage green, bright yellow, tan	P02 - White, dusty rose, red	P03 - Dusty rose, pink	P04 - Dusty rose, mint green
	Sample Date:	06-May-15	06-May-15	06-May-15	06-May-15
	Sample ID:	1519289-01	1519289-02	1519289-03	1519289-04
	MDL/Units	Paint	Paint	Paint	Paint
Physical Characteristics					
% Solids	0.1 % by Wt.	100	100	100	100
EPA 1311 - TCLP Leachate Inorganics					
Lead	0.05 mg/L	<0.05	0.23	1.08	0.09

	Client ID:	P05 - White, butter yellow	P06 - Baby blue, tan, dusty rose	P07 - Light blue, butter yellow	P08 - Tan, dusty rose
	Sample Date:	06-May-15	06-May-15	06-May-15	06-May-15
	Sample ID:	1519289-05	1519289-06	1519289-07	1519289-08
	MDL/Units	Paint	Paint	Paint	Paint
Physical Characteristics					
% Solids	0.1 % by Wt.	100	100	100	100
EPA 1311 - TCLP Leachate Inorganics					
Lead	0.05 mg/L	<0.05	1.12	0.30	0.53

	Client ID:	P09 - Cream, butter yellow	-	-	-
	Sample Date:	06-May-15	-	-	-
	Sample ID:	1519289-09	-	-	-
	MDL/Units	Paint	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	100	-	-	-
EPA 1311 - TCLP Leachate Inorganics					
Lead	0.05 mg/L	<0.05	-	-	-

Certificate of Analysis

Report Date: 13-May-2015
Order Date:7-May-2015

Client: **BluMetric Environmental Inc. (Kingston)**
Client PO: Project Description: KB-13279-00-00

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Inorganics									
Lead	ND	0.05	mg/L						

Certificate of Analysis

Report Date: 13-May-2015
Order Date:7-May-2015

Client: **BluMetric Environmental Inc. (Kingston)**
Client PO: Project Description: KB-13279-00-00

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Inorganics									
Lead	ND	0.05	mg/L	ND			0.0	32	
Physical Characteristics									
% Solids	88.4	0.1	% by Wt.	89.4			1.1	25	

Certificate of Analysis

Report Date: 13-May-2015
Order Date:7-May-2015

Client: **BluMetric Environmental Inc. (Kingston)**
Client PO: Project Description: KB-13279-00-00

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Inorganics									
Lead	46.4		ug/L	ND	92.9	77-126			

Certificate of Analysis

Report Date: 13-May-2015
Order Date:7-May-2015

Client: **BluMetric Environmental Inc. (Kingston)**
Client PO: Project Description: KB-13279-00-00

Qualifier Notes:

None

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.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

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Chain of Custody
(Lab Use Only)

Client Name: BluMetric	Project Reference: KB-13279-00-00	TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day
Contact Name: V.Maynard	Quote #	
Address: The Tower, The Woolen Mill, 4 Cataraqui Street, Kingston ON, K7K 1Z7	PO #	Date Required:
Telephone: 613-531-2725	Email Address: vmaynard@blumetric.ca, kmajor@blumetric.ca, lrenton@blumetric.ca	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1519289

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	TCLP Lead						
1	P01 - Sage green, bright yellow, tan	P	-	1	6 May 2015	-	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐
2	P02 - White, dusty rose, red	P	-	1	6 May 2015	-	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐
3	P03 - Dusty rose, pink	P	-	1	6 May 2015	-	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐
4	P04 - Dusty rose, mint green	P	-	1	6 May 2015	-	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐
5	P05 - White, butter yellow	P	-	1	6 May 2015	-	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐
6	P06 - Baby blue, tan, dusty rose	P	-	1	6 May 2015	-	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐
7	P07 - Light blue, butter yellow	P	-	1	6 May 2015	-	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐
8	P08 - Tan, dusty rose	P	-	1	6 May 2015	-	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐
9	P09 - Cream, butter yellow	P	-	1	6 May 2015	-	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐
10							☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐

Comments:

Method of Delivery: pick-up.

Relinquished By (Sign):	Received By Driver/Depot: Kate Cooper	Received at Lab:	Verified By:
Relinquished By (Print): V.Maynard	Date/Time: May 7/15 12:05	Date/Time: May 8/15 9:12a	Date/Time: May 8/15
Date/Time: 7 May 2015 8:42	Temperature: ____ °C	Temperature: ____ °C	pH Verified [ ] By: N/A

9:12a