



National Research Council
Canada

Conseil national de recherches
Canada

Administrative Services
and Property Management
Branch

Direction des services
administratifs et
gestion de l'immobilier



Addendum / Addenda

No./N^o
1

Project Description / Description de projet HFX - Nitrogen Generation System		
Solicitation No./ No de sollicitation 15-22193	Project No./N ^o de projet HFX-5142	W.O. No./N ^o d'ordre de travail
Project Engineer / Ingénieur de projet Nadine Merkley		Date March 30 th , 2016
<p>Notice: This addendum shall form part of the tender documents and all conditions shall apply and be read in conjunction with the original plans and specifications.</p>		<p>Nota: Cet addenda fait partie intégrale des dossiers d'appel d'offres; toutes les conditions énoncées doivent être lues et appliquées en conjonction avec les plans et les devis originaux.</p>

Attached Addendum #1

PROJECT: NRC Nitrogen Generation System (Solicitation 15-22193)
PROJECT #: HFX-5142
ISSUED BY: Stantec
DATE: March 29, 2016

The following items and clarifications, additions, changes or modifications to contract documents and are being issued as an Addendum to form part of the contract.

1.0 General Questions

- 1) What is the required flow and pressure of the CDA?

Response: 92 cfm at 105 psi.

- 2) What is the ambient temperature (min & max) going to be in the room where the equipment will be installed?

Response: Minimum temperature = 18°C, Maximum Temperature = 25°C

- 3) All contractor personnel will require NRC reliability security clearance, including any sub-contractors.
- 4) A copy of the latest building Hazardous Materials report is attached with Addendum. Hazardous material removal will be conducted as required during the construction.
- 5) A copy of the attendance sheets for the tender meetings on March 22 and 24, 2016 are included.
- 6) Hot work permits will be required on a daily basis (when performing hot work) from NRC operations.

2.0 Drawing Items

1) Reference Drawing 5143 – M01 Demolition Note 2

Only existing nitrogen and compressed air piping that is accessible throughout the building will need to be removed. Concealed piping within gyprock walls or ceiling can remain. Reference to “original section” of building to be deleted and replaced with “entire building”.

2) Reference Drawing 5143 – M01 Demolition Note

Add removal of existing compressed air buffer tank in the basement area as part of the demolition. Add removal of splitter box and conduit/wiring back to emergency panel from existing compressors in the basement area.

3) Reference Drawing 5143 – M01 Mechanical Notes

Contractor responsible for cutting, patching of walls, floors, etc. run piping or installation of equipment. Fire seal any penetrations through fire rated assemblies.

PROJECT: NRC Nitrogen Generation System (Solicitation 15-22193)
PROJECT #: HFX-5142
ISSUED BY: Stantec
DATE: March 29, 2016

4) Reference Drawing 5143 – M01 Mechanical Notes

Contractor to remove door frame(s) on upper level mechanical room to allow for installation of equipment into room. Door frame(s) to be reinstalled and paint, patch wall area.

5) Reference Drawing 5143 – M03 Elevation View 'A'

Provide a final filter on each compressed air line leaving the buffer tank and on each nitrogen line leaving the buffer tank.

6) Reference Drawing 5143 – M03 Elevation View 'A'

Provide an oil/water separator for each compressor line (total of two) contractor to include for field installation on drain line. Atlas Copco model OSC 35 or equivalent alternate.

3.0 Specification Items

1) Reference Specification 22 15 00, paragraph 3.3.5

Soldered elbows at change in direction are acceptable.

2) Reference Specification 22 15 00, paragraph 3.3.8

Branch connections from the side of pipe mains are acceptable.

3) Reference Specification 22 15 00, paragraph 2.3

Sil Fos brazing is required on copper joints and fittings.

4) Reference Specification 43 00 01, paragraph 2.2.1

Provide the purge control accessory for each desiccant air dryer.

5) Reference Specification 43 00 01, paragraph 2.2.4

Nano and O₂N₂ are acceptable alternate Nitrogen Generator products as long as they meet the specifications and capacities identified in contract documents. Prior to final acceptance during shop drawing review the name and contact of local service provide will be required.

---- END OF ADDENDUM ----



**NATIONAL RESEARCH COUNCIL OF CANADA
ASBESTOS SURVEY
1411 OXFORD STREET, HALIFAX, NS**



Prepared for:

National Research Council of Canada
1411 Oxford Street
Halifax, Nova Scotia B3H 3Z1

Attention: Dan Veniot

Prepared by:

Pinchin LeBlanc Environmental Limited
Dartmouth, Nova Scotia
Project 01-02-00067

December 2, 2008

SUMMARY OF FINDINGS

The National Research Council of Canada (NRC) retained Pinchin LeBlanc Environmental Ltd. (PLEL) to perform an asbestos survey of the NRC facility located at 1411 Oxford Street in Halifax, NS. The purpose of the survey was to identify asbestos-containing materials (ACM) present in the building.

Asbestos-containing building materials have been identified within the building. Provincial regulations, codes and guidelines require that asbestos-containing materials affected by renovation, maintenance and/or demolition work be removed in order to prevent the possible release of asbestos fibres. Currently there is no requirement to remove asbestos-containing materials from a building provided that those materials are maintained in a good condition. This has been confirmed by multiple studies conducted in the past and is supported by the various regulatory agencies. Any materials left in place require a management program to be developed to prevent worker or occupant exposure and to ensure that these materials are handled and disposed of in an appropriate manner if disturbed.

The following is a summary of the survey findings.

- The following friable asbestos-containing materials were identified within the building.
 - Canvas-covered "Aircell" pipe insulation identified on condensate return, domestic water ("DW"), and steam supply lines contains >75% chrysotile asbestos. Aircell insulation was noted in FAIR and POOR condition throughout the building.
 - Parging cement identified on fittings (elbows, valves, etc) on the steam supply, drain, DW, and condensate return lines contains >50% chrysotile asbestos. Parging cement was noted in FAIR and POOR condition throughout the building.
 - Parging cement on the steam pressure tank in the basement tank room (location 017) contains 50-75% chrysotile asbestos. All of the parging cement insulation was in GOOD condition.
 - White fibrous paper debris in the pipe chase of Room 235, marine bio-actives lab (location 235) contains 50-75% chrysotile asbestos. As it is debris it is in POOR condition.
- The following potentially friable asbestos-containing materials were identified within the building. Potentially friable materials are those that can be managed in place as a non-friable material, however during removal have the potential to release asbestos fibres.
 - Wall plaster finishes throughout the building should be considered asbestos-containing unless sampling within specific locations proves otherwise.

Exposed plaster base coat (i.e. FAIR condition) was noted on walls and ceilings throughout the building.

- The following non-friable asbestos-containing materials were identified within the building.
 - Tar paper present in insulation wrap on steam supply, DW, and condensate return lines contains 1-5% chrysotile asbestos. Areas of pipe wrap were noted in POOR condition throughout the building.
 - The tar adhesive used in the application of some of the vinyl floor tiles in the building contains 1-5% chrysotile asbestos.
 - Hard board asbestos panel, commonly referred to as "Transite", is present on some sections of the walls and ceilings in the building, as well as in fume hoods in some of the laboratories. The panelling contains 10-25% chrysotile asbestos.
 - Black thermal sink insulation on the underside of a stainless steel sink in the basement storage room contains 1-5% chrysotile asbestos.

SUMMARY OF RECOMMENDATIONS

The following are the specific recommendations made as a result of the survey findings. The specific recommendations are provided to address regulatory compliance as well as the immediate health and safety of building occupants. General and long term recommendations made regarding the survey findings are presented in Section 4.0 of this report.

In order to comply with current codes of practice and regulations, any asbestos-containing materials in poor or fair condition must be removed or repaired to prevent exposure to occupants.

- Use Type 2 asbestos procedures to repair approximately 8 ft of "Aircell" insulation in FAIR condition throughout the building. Alternatively glove-bag procedures may be used for repair of the pipe insulation.
- Use Type 2 asbestos procedures to remove approximately 10 ft of "Aircell" insulation in POOR condition throughout the building. Alternatively glove-bag procedures may be used for removal of the pipe insulation.
- Use Type 2 or Type 3 asbestos procedures to remove approximately sixty-five (65) parging cement fittings in FAIR condition and thirty-two (32) parging cement fittings in POOR condition throughout the building. Determination of the asbestos procedures depends on the number of fittings in each room (greater than ten (10) fittings requires Type 3 asbestos procedures). Alternatively glove-bag procedures may be used for removal of parging cement fittings.
- Use Type 2 asbestos procedures to remove approximately 2 ft² of white fibrous paper debris in Room 235, marine bio-actives lab (location 235).
- Use Type 2 asbestos procedures for any work involving small quantities (less than 10 ft²) of potentially friable asbestos products such as plaster. If larger amounts are to be removed, use Type 3 asbestos procedures. Minor activities that do not disturb the plaster finishes including installing hangers or surface patching would not require special handling procedures.
- Use Type 1 (low risk) asbestos procedures to repair approximately 169 ft of Layer paper and tar insulation in POOR condition throughout the building.
- Use Type 1 asbestos procedures to repair approximately 9 ft² of "Transite" panelling in POOR condition throughout the building. If power tools are to be used or if significant breakage of the panels is anticipated then Type 2 asbestos procedures should be used.

The Executive Summary and Executive Recommendations are subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
1.0 INTRODUCTION.....	1
2.0 SURVEY AND ASSESSMENT CRITERIA	1
2.1 SCOPE.....	1
2.2 SURVEY METHODOLOGY	1
2.3 REGULATORY REQUIREMENTS.....	2
2.4 SAMPLING STRATEGY.....	3
2.5 EVALUATION OF CONDITION	3
2.6 ASSESSMENT EXCLUSIONS.....	5
3.0 ASBESTOS-CONTAINING MATERIALS (ACM)	5
3.1 SUMMARY OF ASBESTOS SAMPLE RESULTS.....	5
3.2 FRIABLE ASBESTOS-CONTAINING MATERIALS (ACM)	5
3.2.1 <i>Sprayed or Trowelled Fireproofing and Thermal Insulation.....</i>	<i>5</i>
3.2.2 <i>Piping Insulation</i>	<i>6</i>
3.2.3 <i>Ductwork Insulation</i>	<i>8</i>
3.2.4 <i>Mechanical Insulation.....</i>	<i>8</i>
3.3 POTENTIALLY FRIABLE ASBESTOS-CONTAINING MATERIALS (ACM).....	8
3.3.1 <i>Acoustic Ceiling Tiles</i>	<i>8</i>
3.3.2 <i>Plaster and Texture Finishes.....</i>	<i>9</i>
3.3.3 <i>Vinyl Sheet Flooring</i>	<i>10</i>
3.3.4 <i>Vermiculite Insulation</i>	<i>10</i>
3.4 NON-FRIABLE ASBESTOS-CONTAINING MATERIALS (ACM).....	10
3.4.1 <i>Piping Insulation</i>	<i>10</i>
3.4.2 <i>Vinyl Floor Tiles.....</i>	<i>12</i>
3.4.3 <i>Drywall.....</i>	<i>13</i>
3.4.4 <i>Asbestos Cement Products.....</i>	<i>13</i>
3.5 OTHER ASBESTOS-CONTAINING MATERIALS	14
4.0 RECOMMENDATIONS.....	15
4.1 <i>General Recommendations.....</i>	<i>15</i>
4.2 <i>Specific Recommendations.....</i>	<i>17</i>
5.0 SURVEY LIMITATIONS.....	17
6.0 CLOSURE.....	18

LIST OF APPENDICES

APPENDIX I	ASBESTOS ANALYTICAL RESULTS
APPENDIX II	SAMPLE LOCATIONS DRAWING
APPENDIX III	PHOTOGRAPHS

1.0 INTRODUCTION

The National Research Council of Canada (NRC) retained Pinchin LeBlanc Environmental Ltd. (PLEL) to perform an asbestos survey of the NRC facility located at 1411 Oxford Street in Halifax, NS. The purpose of the survey was to identify asbestos-containing materials (ACM) present in the building.

Current provincial codes of practice distinguish between friable and non-friable materials when assigning appropriate work practices, the asbestos survey included both friable and non-friable asbestos-containing materials as well as potentially friable asbestos-containing materials. The term friable is applied to a material that can be readily reduced to dust or powder by hand or moderate pressure. Asbestos materials that are friable have a much greater potential to release airborne asbestos fibres when disturbed. Potentially friable products are those that can be managed in place as a non-friable asbestos material; however, during removal have the potential to release asbestos fibres.

The following report presents the results of the survey including methodology, general survey notes, regulatory requirements and analytical sample results as required. The survey conducted satisfies the requirements of the Occupational Health and Safety Act.

2.0 SURVEY AND ASSESSMENT CRITERIA

2.1 Scope

The objective of the survey was to establish the location, condition and type of friable and non-friable asbestos-containing building materials. The survey included a search for asbestos incorporated in the structure and its finishes. Not included, was an assessment of owner or occupant articles within the structure(s) (i.e. stored items, furniture, etc.), sampling of materials that could result in damage to the building (specific exclusions are described below), or subsurface materials or equipment (vessels, drums, underground storage tanks, pipes, etc.) or possible contaminants in the soil and groundwater on the site. Specific exclusions are described in Section 2.6.

The scope also included providing recommendations regarding removal, disposal, and containment options for the identified deteriorated asbestos-containing materials.

2.2 Survey Methodology

The survey was performed by Mr. Steven Moore of PLEL. The survey, collection of representative samples and recording of information took place on November 6, 7, and 10, 2008.

All accessible locations in the building were surveyed. In each of the locations, the surveyor conducted an assessment of the asbestos-containing materials present and recorded the information on field survey sheets. A unique location number was assigned to each of the surveyed locations. Sample locations and assigned location numbers for

collected samples are identified on the drawings in *Appendix II*. Quantities of deteriorated ACM were also noted during the survey.

Concealed locations such as spaces above solid ceilings, shafts and pipe chases were accessed via existing access panels only. Our investigation did not include demolition of drywall or plaster walls, or removal of finishes to view concealed conditions. Structural items or exterior building finishes were not removed to determine the presence of concealed materials. Wall spaces and concealed chases (e.g. at washrooms) were not demolished or accessed during this assessment. The investigation was limited to non-intrusive testing at request of the client.

The surveyor inspected for the presence of friable and non-friable asbestos-containing materials (ACM). Typical examples of friable ACM include sprayed fireproofing, acoustic/texture finish, and mechanical insulation. Typical examples of non-friable ACM include asbestos cement sheets or pipes, vinyl floor tiles, vinyl sheet flooring, drywall compound and asbestos textile products (curtains, vibration dampers). Typical examples of non-friable ACM, which might become friable during construction, include plaster and acoustic ceiling tiles.

Where necessary, samples of suspect asbestos building materials were collected for analysis and confirmation. Each collected sample was given a distinctive number that included the PLEL project number, followed by a sequential number (i.e. 01-02-67-SXXX). Asbestos analytical results are provided in *Appendix I*.

Photographs identifying points of interest within the building are provided in *Appendix III*.

2.3 Regulatory Requirements

Each province has issued regulations or guidelines for control of work around asbestos building materials and for the packaging and disposal of asbestos waste. In addition, the federal government has issued regulations for packaging and transporting asbestos waste. Nova Scotia Environment and Labour (NSEL) have issued codes of practice, guidelines and an information package, which are enforceable under the Occupational Health and Safety Act. These are:

- Code of Practice for Removal of Asbestos-Containing Materials
- Code of Practice for Managing Asbestos in Buildings
- Maintenance Operations Involving Asbestos - A Guideline
- Outdoor Work with Asbestos (Removal Projects) - A Guideline
- Dealing with Asbestos-Containing Materials - An Information Package

The codes define an asbestos-containing material as a material which contains greater than 1% asbestos by volume. Prior to demolition or partial demolition of a building or equipment all ACM must be removed.

In Nova Scotia the handling and disposal of asbestos waste is covered by the Asbestos Waste Management Regulation (N.S. Reg. 53/95) made under the Nova Scotia Environment Act. It is acceptable by NSEL for non-friable materials, provided that they remain in a non-friable state during removal, to be disposed of in a C&D disposal facility. However, should the disposal facility pulverize the material as part of their disposal procedure, non-friable asbestos materials would not be permitted by NSEL for disposal at this location since the non-friable material would no be considered friable. Confirmation of acceptance by the receiving landfill should be made before disposing non-friable waste.

2.4 Sampling Strategy

Asbestos samples were collected in accordance with the National Institute for Occupational Safety and Health (NIOSH) method 9002 using appropriate personal protective equipment. The collection of friable asbestos samples was performed with the intent to obtain a general pattern of asbestos use within the buildings. It is known that inconsistencies within construction or later repair or renovation may result in deviation from the general pattern. Therefore, the surveyor relies on visual identification of similar materials with asbestos content based on representative bulk samples. The surveyor used information obtained on site by visual examination, available information on the phases of the construction and information on renovations obtained from the client to determine the extent of each homogeneous area and the number of samples required. It should be noted that the possibility remains that visually similar materials may have different asbestos contents.

2.5 Evaluation of Condition

The condition of any asbestos-containing material found was evaluated as well as the potential for disturbance of the asbestos material. These evaluation criteria were based on the conclusions of published studies, particularly the "Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario", existing Ontario regulation, and our experience involving buildings that contain ACM.

Mechanical Insulation

The evaluation of the condition of mechanical insulation (on surface of boilers, breeching, exhausts, ductwork, piping, tanks, equipment etc.) utilizes the following criteria:

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

- FAIR Minor penetrating damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that had never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges from minor to none. Damage can be repaired.
- POOR Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired.

The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or bulkheads that obstruct observations. It is not possible to observe each foot of mechanical insulation from all angles. Persons working in proximity to mechanical insulation or entering ceilings with mechanical insulation are advised to be watchful of asbestos containing DEBRIS regardless of the reported condition.

Non-friable and Potentially Friable Materials

The condition of non-friable asbestos-containing material, such as plaster finishes containing asbestos and manufactured products such as acoustic ceiling tiles and asbestos cement products (Transite), all of which have the potential to become friable when handled are evaluated as follows:

- GOOD No significant damage. Material may be cracked or broken but is stable and not likely to become friable upon casual contact.
- POOR Material is severely damaged. Loose DEBRIS is present or binder has disintegrated to the point where contact will cause the material to become friable.

The evaluation of the condition of non-friable and potentially friable materials does not utilize a FAIR condition rating.

The priority for remedial action is based not only on the evaluation of condition but is also based on several other factors which include:

- Accessibility or potential for direct contact and disturbance which can cause release of asbestos to the air.
- Practicality of repair (for example, will damage to the asbestos-containing material continue even if it is repaired).
- Efficiency of the work (for example, if damaged asbestos-containing materials is being removed in an area, it may be most practical to remove all asbestos-containing materials in the area even if it is in GOOD condition).

Recommendations also include those that are mandatory regulated requirements, such as some provincial requirements for institution of an Asbestos Management Program,

training, record keeping etc.

2.6 Assessment Exclusions

Sampling of a number of possible asbestos-containing materials could *not* be included in our assessment. The presence of asbestos must be suspected and these materials are best sampled *immediately* prior to removal during renovation. These suspect materials are listed below, and could not be sampled as it causes significant damage to the material or building:

- elevator and lift brakes
- components or wiring within motors or lights
- high voltage wiring
- mechanical packing, ropes and gaskets
- exterior cladding, soffit and fascia boards at high levels not accessible for assessment
- cores of doors (fire doors or soundproof doors)
- demountable fire resistant metal clad walls
- vermiculite inside masonry or other wall assemblies

Inaccessible ceiling spaces above solid ceilings, and inaccessible column enclosures, shafts and chases were viewed via existing access panels where present. Our assessment did not include demolition of masonry, to view concealed conditions.

3.0 **ASBESTOS-CONTAINING MATERIALS (ACM)**

3.1 Summary of Asbestos Sample Results

The survey involved the collection of a total of fifty (50) suspect asbestos building materials. Multiple phases within each sample are analyzed independently, as a result of this a total of sixty-eight (68) analyses were performed on the submitted samples.

The samples were submitted to the PLEL laboratory for analysis.

3.2 Friable Asbestos-Containing Materials (ACM)

3.2.1 *Sprayed or Trowelled Fireproofing and Thermal Insulation*

Sprayed or trowelled fireproofing insulating materials were not observed in the building.

3.2.2 Piping Insulation

Canvas-covered "Aircell" pipe insulation was sampled from a steam supply line in the basement machine shop (location 003). Analysis of this insulation identified the presence of >75% chrysotile asbestos (sample 01-02-67-S005). This insulation was visually identified on condensate return, domestic water ("DW"), and steam supply lines. Aircell pipe insulation is present in the following locations. Approximate quantities of Aircell pipe insulation in FAIR and POOR condition are noted in parentheses:

- Location 003, machine shop (approximately 6 ft in FAIR condition and 6 ft in POOR condition).
- Location 011, CRMP storage area (approximately 1 ft in FAIR condition).
- ~~Location 054, Room 156, machine shop.~~
- Location 056, Room 141 and offices (approximately 4 ft in POOR condition). *Removed*
- Location 057, carpentry shop (approximately 1 ft in FAIR condition). *Removed.*
- Location 100, marine bioactives lab. *5ft overhead*

(12)
20ft Multiple fittings
5ft

Concealed Aircell pipe insulation is expected in the pipe chases along the exterior walls of the west wing of the building. No Aircell was observed in the pipe chases of the east wing of the building.

Parging cement was sampled from a steam supply fitting in the basement machine shop (location 003). Analysis of the parging cement identified the presence of >75% chrysotile asbestos (sample 01-02-67-S006). Parging cement was sampled from a drain fitting in the basement west hallway (location 024). Analysis of the parging cement identified the presence of 50-75% chrysotile asbestos (sample 01-02-67-S020). This parging cement was visually identified on steam supply, drain, DW, and condensate return lines, and is present in the following locations. Approximate quantities of parging cement in FAIR and POOR condition are noted in parentheses:

- Location 003, basement machine shop (approximately six (6) in POOR condition).
- Location 011, CRMP storage area.
- Location 016, basement server/communication room.
- Location 017, basement tank room (one (1) in FAIR condition). *Repaired*
- Location 018, electrical room (one (1) in FAIR condition and one (1) in POOR condition). *Repaired*

Repaired
↑ Removed

- Location 019 and 024, basement east hallway (approximately five (5) in FAIR — *Repaired* condition).
- Location 020, Room 6 (approximately two (2) in POOR condition). — *Repaired* —
- Location 022, storage archives.
- Location 025, condensate return tank room (one (1) FAIR condition). *227? Repaired*
- Location 026, east stairwell.
- Location 027, 1st floor men's washroom.
- Location 028, 1st floor east hallway and pipe chases (approximately twenty (20) in FAIR condition and twenty (20) in POOR condition). *Removed*
- Location 034, Room 114, freezers (one (1) in FAIR condition). *Repaired*
- Location 039, Room 119A.
- Location 056, Room 141 and offices. *Removed*
- Location 057, carpentry shop. *4? [unclear]*
- Location 083, 1st floor west corridor (approximately five (5) in FAIR condition). *Removed*
- Location 121, 2nd floor east corridor and pipe chases (approximately eleven (11) in FAIR condition and one (1) in POOR condition). *Removed or Repaired*
- Location 186, 3rd floor east corridor and pipe chases (approximately nine (9) in FAIR condition and one (1) in POOR condition). *Removed or Repaired*
- Location 190, Room 304A and office.
- Location 224, dishwashing room.
- Location 255, chiller room.
- Location 256, old mechanical penthouse (eleven (11) in FAIR condition and one (1) in POOR condition). *still some repairs*
- Location 257, generator/elevator room.
- Location 261, Room 106-110.
- Location 262, office.

Concealed parging cement fittings are expected in the pipe chases throughout the building.

White fibrous paper debris was sampled in the pipe chase of Room 235, marine bio-actives lab (location 235). Analysis of the paper debris identified the presence of 50-75% chrysotile asbestos (sample 01-02-67-S037). There is approximately 2 ft² of this material in POOR condition. Concealed fibrous paper is expected in the pipe chases throughout the building.

Removed

Sweat wrap was sampled from a DCW line in the basement machine shop (location 003) and does not contain asbestos (sample 01-02-67-S007).

A thermal insulation coating was sampled from a drain line in Room 341A (location 230) and does not contain asbestos (sample 01-02-67-S049).

Sprinkler lines are not insulated.

3.2.3 *Ductwork Insulation*

Ductwork within the building is either not insulated or insulated with fibreglass.

3.2.4 *Mechanical Insulation*

Canvas-covered parging cement was sampled from a steam pressure tank in the basement tank room (location 017). Analysis of the parging cement identified the presence of 50-75% chrysotile asbestos (sample 01-02-67-S017). All of the parging cement insulation was in GOOD condition.

Parging cement was sampled from a domestic hot water tank in the basement tank room (location 017) and does not contain asbestos (sample 01-02-67-S016).

The remaining mechanical equipment observed in the building was either not insulated or insulated with non-asbestos fibreglass insulation.

3.3 Potentially Friable Asbestos-Containing Materials (ACM)

3.3.1 *Acoustic Ceiling Tiles*

Five (5) types of acoustic ceiling tiles were observed in the building. None of the ceiling tiles contain asbestos. The following is a summary of the different types of ceiling tiles observed.

- AT-01, lay-in ceiling tiles, 2'x2' in size and distinguished by a hole and fleck pattern. These ceiling tiles were sampled in the basement GLP storage room (location 009) and do not contain asbestos (sample 01-02-67-S012).
- AT-02, lay-in ceiling tiles, 2'x2' in size and distinguished by a textured pattern. These ceiling tiles were sampled in Room 105 (location 032) and do not contain asbestos (sample 01-02-67-S023).

- AT-03, lay-in ceiling tiles, 2'x2' in size and distinguished by a hole and textured pattern. These ceiling tiles were sampled in the 1st floor lobby (location 049) and do not contain asbestos (sample 01-02-67-S031).
- AT-04, lay-in ceiling tiles, 2'x2' in size and distinguished by a pinhole and hole pattern. These ceiling tiles were sampled in the Room 139, electrical room (location 058) and do not contain asbestos (sample 01-02-67-S029).
- AT-05, glue-on ceiling tiles, 1'x1' in size and distinguished by a fissure and textured pattern. These ceiling tiles were sampled in the Room 230 (location 108) and do not contain asbestos (sample 01-02-67-S038).

3.3.2 Plaster and Texture Finishes

A total of twelve (12) samples of plaster finishes were collected throughout the building. Representative samples, for screening purposes, resulted in the following:

- Analysis of one (1) representative sample of plaster (base coat only) over the concrete walls in the basement west stairwell (location 004) detected the presence of 1-5% chrysotile asbestos in the base coat (sample 01-02-67-S009).
- Analysis of one (1) representative sample of plaster on the ceiling in the 2nd floor west corridor (location 083) detected the presence of 1-5% chrysotile asbestos in the base coat (sample 01-02-67-S032).
- Analysis of one (1) representative sample of plaster on walls in the 2nd floor west corridor (location 083) detected the presence of 1-5% chrysotile asbestos in the base coat (sample 01-02-67-S032).
- Analysis of one (1) representative sample of plaster on walls in the 3rd floor west passage (location 083) detected the presence of 1-5% chrysotile asbestos in the base coat (sample 01-02-67-S048).
- Analysis of one (1) representative sample of plaster on the walls in the basement machine shop (location 003) did not detect asbestos (sample 01-02-67-S003).
- Analysis of one (1) representative sample of plaster on the walls in Room 119 (location 038) did not detect asbestos (sample 01-02-67-S025).
- Analysis of one (1) representative sample of plaster on the walls in the 1st floor west corridor (location 052) did not detect asbestos (sample 01-02-67-S026).
- Analysis of one (1) representative sample of plaster on the ceiling in Room 156, carpentry shop (location 054) did not detect asbestos (sample 01-02-67-S027).
- Analysis of one (1) representative sample of plaster on the walls in Room 205A (location 131) did not detect asbestos (sample 01-02-67-S041).

- Analysis of one (1) representative sample of plaster on the ceiling in Room 218A, GLP chemical storage (location 143) did not detect asbestos (sample 01-02-67-S043).
- Analysis of one (1) representative sample of plaster on the walls in the 3rd floor female washroom (location 210) did not detect asbestos (sample 01-02-67-S046).
- Analysis of one (1) representative sample of plaster (base coat) on the ceiling in 4th floor west corridor (location 219) did not detect asbestos (sample 01-02-67-S047).

Based on the inconstancy of the sample results and the visual observations, all walls with plaster finishes in the building should be considered asbestos-containing unless sampling within specific locations proves otherwise. Exposed plaster base coat was noted on walls and ceilings throughout the building rating these areas in FAIR condition.

3.3.3 Vinyl Sheet Flooring

Two (2) distinct types of vinyl sheet flooring were identified in the building, none of which were found to contain asbestos. The following is a summary of the vinyl sheet flooring present in the building:

- Beige vinyl sheet flooring with blue and gray pattern was sampled in Room 112 (location 017) and does not contain asbestos (sample 01-02-67-S024).
- Blue/green/red speckled pattern vinyl sheet flooring was sampled in Room 224 (location 145) and does not contain asbestos (sample 01-02-67-S044).

3.3.4 Vermiculite Insulation

No loose fill vermiculite insulation was observed in the building. Destructive or intrusive inspections within wall or roof systems were not within the scope of this survey.

3.4 Non-Friable Asbestos-Containing Materials (ACM)

3.4.1 Piping Insulation

Layer paper and tar insulation was sampled from a condensate return line in the basement hallway (location 004). Analysis identified the presence of 1-5% chrysotile asbestos in the tar and no asbestos in the covering paper (sample 01-02-60-S010). This tar was visually identified on steam supply, DW, and condensate return lines, and is present in the following locations. Approximate quantities of tar in POOR condition are noted in parentheses:

- Location 004, basement west hallway (approximately 16 ft in POOR condition).

Repaired

- Location 008, compressor room (approximately 2 ft in POOR condition). *Reported*

- Location 009, Room 12, GLP storage.

- Location 011, CRCMP storage area (approximately 2 ft in POOR condition). *Reported*

- Location 012, central stairwell (approximately 1 ft in POOR condition). *Reported*

- Location 014, marine microalgae room (approximately 1 ft in POOR condition). *Reported*

- Location 016, basement server/communication room.

- Location 017, basement tank room (approximately 6 ft in POOR condition). *Reported*

- Location 018, electrical room (approximately 1 ft in POOR condition). *Reported*

- Location 019 and 024, basement east hallway (approximately 38 ft in POOR condition). *Reported*

- Location 020, Room 6.

- Location 021, storage room (approximately 7 ft in POOR condition). *Reported*

- Location 022, storage archives.

- Location 025, condensate return tank room.

- Location 026, east stairwell.

- Location 027, 1st floor men's washroom.

- Location 028, 1st floor east hallway and pipe chases.

- Location 029, 1st floor fan room.

- Location 030, Room 104.

- Location 032, marine bio-organic chemistry lab.

- Location 035, Room 111, microscopy lab.

- Location 038, Room 119, stores (approximately 1 ft in POOR condition). *Reported*

- Location 039, Room 119A.

- Location 056, Room 141 and offices (approximately 2 ft in POOR condition). *Reported*

- Location 057, carpentry shop.

- Location 083, 1st floor west corridor.

Reported
Also found textile
on clamps

- Location 121, 2nd floor east corridor and pipe chases (approximately 40 ft in POOR condition).
- Location 186, 3rd floor east corridor and pipe chases (approximately 40 ft in POOR condition).
- Location 255, chiller room (approximately 2 ft in POOR condition).
- Location 256, old mechanical penthouse (approximately 10 ft in POOR condition).

Concealed paper insulation covering tar is expected in the pipe chases throughout the building.

3.4.2 Vinyl Floor Tiles

Twelve (12) types of vinyl floor tile were sampled based on size, colour and pattern. The following is a detailed listing of the vinyl floor tiles identified during the survey.

- Floor tile, FT-01, 12"x12" in size, white with pink flecks, was sampled in the basement west corridor (location 003). These vinyl floor tiles do not contain asbestos (sample 01-02-67-S008).
- Floor tile, FT-02, 12"x12" in size, beige with tan streaks, was sampled in the basement men's washroom (location 005). These vinyl floor tiles do not contain asbestos (sample 01-02-67-S011).
- Floor tile, FT-03, 12"x12" in size, beige with brown streaks, was sampled in Room 9 (location 015). These vinyl floor tiles do not contain asbestos (sample 01-02-67-S014).
- Floor tile, FT-04, 12"x12" in size, blue in colour, was sampled in the basement server room (location 016). These vinyl floor tiles do not contain asbestos (sample 01-02-67-S015).
- Floor tile, FT-05, 12"x12" in size, tan with brown and white flecks, was sampled in the basement storage archives (location 022). These vinyl floor tiles do not contain asbestos (sample 01-02-67-S018).
- Floor tile, FT-06, 12"x12" in size, white with tan flecks, was sampled in Room 104 (location 030). These vinyl floor tiles do not contain asbestos (sample 01-02-67-S021).
- Floor tile, FT-07, 12"x12" in size, light grey with dark grey flecks, was sampled in Room 154 (location 055). These vinyl floor tiles do not contain asbestos (sample 01-02-67-S028).

- Floor tile, FT-08, 12"x12" in size, white with yellow flecks, was sampled in Room 254 (location 086). These vinyl floor tiles do not contain asbestos (sample 01-02-67-S035).
- Floor tile, FT-09, 12"x12" in size, black with white streaks, was sampled in Room 254 (location 086). These vinyl floor tiles do not contain asbestos (sample 01-02-67-S036).
- Floor tile, FT-10, 12"x12" in size, green and white speckled, was sampled in Room 204 (location 124). These vinyl floor tiles do not contain asbestos (sample 01-02-67-S040).
- Floor tile, FT-11, 12"x12" in size, white with blue flecks, was sampled in the Mass. Spec. Room (location 135). These vinyl floor tiles do not contain asbestos (sample 01-02-67-S042).
- Floor tile, FT-12, 9"x9" in size, white with grey streaks, was sampled in the chiller room (location 225). These vinyl floor tiles do not contain asbestos (sample 01-02-67-S050).

3.4.3 Drywall

Drywall was used to construct some walls and ceilings in the building. Asbestos was often present in drywall compound prior to the early 1980's. Since replacing or installing drywall is often part of renovations, and sections of walls and ceilings may have been replaced since the original construction, significant sampling must be performed to locate asbestos-containing drywall compounds.

Analysis of five (5) representative samples of drywall joint compound from typical walls and ceilings within the building did not detect the presence of asbestos (samples 01-02-67-S013, 01-02-67-S019, 01-02-67-S022, 01-02-67-S034 and 01-02-67-S045). Based on the sampling results, all of the drywall joint compound in the building would be considered non-asbestos.

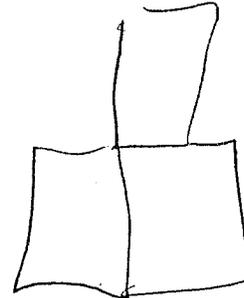
3.4.4 Asbestos Cement Products

Hard board asbestos cement panels, commonly referred to as "Transite", are present on some sections of the walls and ceilings in the building, as well as in fume hoods in some of the laboratories. The panelling was sampled from the walls in the basement machine shop (location 003) and contains 10-25% chrysotile asbestos (sample 01-02-67-S004). The Transite was visually identified in the following locations on walls and ceilings, and inside fume hoods. Approximate quantities in POOR condition are noted in parentheses.

- ~~Location 003, basement machine shop (approximately 4ft² in POOR condition).~~
- Location 087, algal research lab.

- Location 100, marine bioactives lab.
- Location 102, Room 235.
- Location 103, Room 235A.
- Location 124, Room 204.
- Location 125, Room 204A.
- ~~Location 130, Room 207 (approximately 5ft² in POOR condition).~~
- Location 131, Room 205A.
- Location 135, Mass. Spec. Room.
- Location 136, Room 211A.
- Location 137, Room 213A.
- Location 138, Room 215A.
- Location 144, GLP/Natural Toxins lab.
- Location 191, corridor with freezers.
- Location 192, Room 312.
- Location 199, Room 316.
- Location 234, Room 335.
- Location 259, Room 258E.

*Removed
SW Lab*



3.5 Other Asbestos-Containing Materials

Occasionally the tar adhesive used during the application of the vinyl floor tiles may contain asbestos. During sampling of vinyl floor tiles, this tar adhesive will be present on the backside of the vinyl floor tile and is analyzed independently. Analysis of one (1) example of the tar adhesive used in the application of the 12"x12" vinyl floor tiles detected the presence of 1-5% chrysotile asbestos (samples 01-02-67-S018). This tar adhesive would be a non-friable product and would be concealed by the vinyl floor tiles.

Black thermal sink insulation was sampled on the underside of a sink in the basement storage room (location 001). Analysis of the insulation identified the presence of 1-5% chrysotile asbestos (sample 01-02-67-S002). This material would be considered a non-friable material.

Grey mastic was sampled from ductwork in the basement storage room (location 001) and does not contain asbestos (sample 01-02-67-S001).

Levelling compound was sampled in Room 139 (location 058) and does not contain asbestos (sample 01-02-67-S030).

Tar paper was sampled on ductwork in the east wing pipe chases (location 121) and does not contain asbestos (sample 01-02-67-039).

4.0 RECOMMENDATIONS

4.1 General Recommendations

Asbestos-containing materials have been identified in the building. As such, an Asbestos Management Program must be implemented for the building in accordance to the "Code of Practice for Managing Asbestos in Buildings". Key elements of the Management Program will include the following:

- Materials inventory (Asbestos Survey) to be kept onsite and updated annually (minimum).
- Notification of workers, other staff, and outside contractors of asbestos locations.
- Preparation of written asbestos work practices.
- Repair or removal of all damaged, friable asbestos where it may be disturbed and become airborne (see Specific Recommendations).
- Worker training, equipment and facilities (including health effects and regulations).
- Submission of Asbestos Work Reports to the Department of Labour (annually) and other record-keeping.
- In addition to the minimum regulatory requirements, an Asbestos Management Program should include other items to ensure good compliance (allocation of internal responsibilities, standard forms, provisions for inspection and air monitoring, etc.).
- Providing maintenance and custodial workers with documented and organized information, inventory and repair schedules of materials, combined with comprehensive training sessions, an effective Asbestos Management Program can be achieved.

Provincial regulations, codes and guidelines require that materials affected by maintenance, renovation and/or demolition work be removed in order to prevent the possible release of asbestos fibres. Currently there is no requirement to remove asbestos-containing materials from a building provided that those materials are maintained in a good condition to prevent possible exposure. This has been confirmed by multiple studies conducted in the past and is supported by the various regulatory

agencies. Any materials left in place require a management program to be developed to prevent worker or occupant exposure and to ensure that these materials are handled and disposed of in an appropriate manner if disturbed.

All friable asbestos-containing materials that were noted to be in GOOD condition, must remain so to comply with the current Provincial Guidelines. Maintain surveillance of these materials to ensure they remain in GOOD condition. Removal or repair may also be required if the material deteriorates.

Use the appropriate asbestos work procedures, Type 1 (low risk), Type 2 (moderate risk), and Type 3 (high risk) when handling any ACM. Note that the specific work procedures employed would dictate the level of protection required for the removal of the various asbestos material (i.e. the use of power tools may require a higher level of asbestos precautions, versus removal of the material with hand tools). PLEL recommends that handling of asbestos-containing materials be conducted by a qualified contractor familiar with asbestos abatement procedures.

Use Type 2 asbestos work procedures for all small quantities (less than 10 square feet or 10 linear feet or 10 items) of friable materials such as identified "Aircell" pipe insulation, parging cement pipe fittings, and parging cement on tanks. Alternatively glove-bag procedures may be used for the pipe insulation and the parging cement fittings.

Use Type 3 asbestos work procedures for larger quantities (greater than 10 square feet or 10 linear feet or 10 items) of friable materials such as identified "Aircell" pipe insulation, parging cement pipe fittings, and parging cement on tanks. Alternatively glove-bag procedures may be used for the pipe insulation and the parging cement fittings.

Use Type 2 asbestos procedures for any work involving small quantities (less than 10 ft²) of potentially friable asbestos products such as plaster. If larger amounts are to be removed, use Type 3 asbestos procedures. Minor activities that do not disturb the plaster finishes including installing hangers or surface patching would not require special handling procedures.

Inspection and monitoring by a health and safety professional is recommended for Type 2 and Type 3 asbestos related work.

Use Type 1 asbestos procedures for any work involving "Transite" panelling. If power tools are to be used or if significant breakage of the panels is anticipated then Type 2 asbestos procedures should be used.

Use Type 1 asbestos procedures for any work involving non-friable asbestos products such as tar on pipes or beneath vinyl floor tiles.

Asbestos waste must be disposed of at an approved waste disposal site in accordance

to the Nova Scotia Asbestos Waste Management Regulations.

4.2 *Specific Recommendations*

Use Type 2 asbestos procedures to repair approximately 8 ft of "Aircell" insulation in FAIR condition throughout the building. Alternatively glove-bag procedures may be used for repair of the pipe insulation.

Use Type 2 asbestos procedures to remove approximately 10 ft of "Aircell" insulation in POOR condition throughout the building. Alternatively glove-bag procedures may be used for removal of the pipe insulation.

Use Type 2 or Type 3 asbestos procedures to remove approximately sixty-five (65) parging cement fittings in FAIR condition and thirty-two (32) parging cement fittings in POOR condition throughout the building. Determination of the asbestos procedures depends on the number of fittings in each room (greater than ten (10) fittings requires Type 3 asbestos procedures). Alternatively glove-bag procedures may be used for removal of parging cement fittings.

Use Type 2 asbestos procedures to remove approximately 2 ft² of white fibrous paper debris in Room 235, marine bio-actives lab (location 235).

Use Type 2 asbestos procedures for any work involving small quantities (less than 10 ft²) of potentially friable asbestos products such as plaster. If larger amounts are to be removed, use Type 3 asbestos procedures. Minor activities that do not disturb the plaster finishes including installing hangers or surface patching would not require special handling procedures.

Use Type 1 (low risk) asbestos procedures to repair approximately 169 ft of Layer paper and tar insulation in POOR condition throughout the building.

Use Type 1 asbestos procedures to repair approximately 9 ft² of "Transite" panelling in POOR condition throughout the building. If power tools are to be used or if significant breakage of the panels is anticipated then Type 2 asbestos procedures should be used.

5.0 **SURVEY LIMITATIONS**

This report was produced for NRC. A number of limitations are described throughout this report. The intent of the limitations is to clearly identify to the user of this report, that due to the nature of building construction, some limitations exist as to the possible thoroughness of a survey.

PLEL warrants that the findings and conclusions contained herein have been derived in accordance with generally accepted inventory methods. The work has been completed in accordance with client request and agreed upon scope of work, schedule and budget. These evaluation methods have been developed to provide the client with information regarding apparent indications of existing or potentially hazardous conditions relating to the

site and are limited to the conditions observed and information available at the time of the site visit. There is a distinct possibility that conditions may exist which could not be reasonably identified within the scope of the survey or which were not apparent during the site visit.

This investigation was not exhaustive and cannot be construed as a certification of the absence of any hazardous materials from the site. Conclusions derived are specific and limited to the immediate area of investigation. Representative samples have been analyzed for substances that are expected, based on the data available at the time of the study. The absence of information relating to a specific substance does not preclude its presence.

Third party use of this report, or any reliance on or decisions made based on the findings of this report, are the sole responsibility of such third parties. PLEL accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted based on this report.

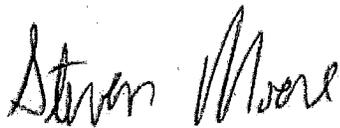
6.0 CLOSURE

We trust that the aforementioned report addresses your requirements. We would be happy to discuss the results of this survey further or assist you in any of the recommendations made within this report. Should you require clarification or information regarding this report, please contact the undersigned.

Respectfully submitted,

Pinchin LeBlanc Environmental Limited

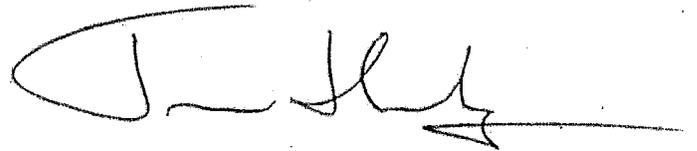
Prepared by:



Per...Steven Moore, P.Eng.

Project Engineer
smoore@pinchinleblanc.com

Reviewed by:



Per...Trevor Houweling, P.Eng

Senior Engineer/Project Manager
thouweling@pinchinleblanc.com

APPENDIX I

ASBESTOS ANALYTICAL RESULTS



**ANALYSIS OF BULK SAMPLES FOR ASBESTOS CONTENT
BY POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING**

PROJECT NAME: National Research Council
ACM Survey

PROJECT NO.: 01-02-00067

LAB REFERENCE NO.: Db5268 - 2008

DATE: November 20, 2008

Fifty samples were received for determination of its asbestos content by Polarized Light Microscopy and Dispersion Staining.

Sample preparation and analytical procedures are in compliance with the Code for the Determination of Asbestos from Bulk Insulation Samples, dated the 23rd of August, 1985 and issued by the Occupational Health and Safety Division of the Ontario Ministry of Labour, and U.S. EPA Method 600/R-93/116 dated July, 1993. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the volume percentage of asbestos present. The lower limit of reliable quantitation is estimated to be 0.1%. A reported concentration of <0.1% indicates the presence of confirmed asbestos in trace quantities limited to only a few fibres or fibre bundles in an entire sample. Multiple phases within a sample are analyzed separately. A total of sixty-eight analyses were performed.

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three months. Samples may be retrieved, upon request, for re-examination at any time during that period.

This test relates only to the items tested. The results are presented in the attached table.



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey

LAB REFERENCE No: Db5268 – 2008

PREPARED FOR: Steven Moore

DATE: November 20, 2008

Pinchin LeBlanc Environmental Ltd.

PAGE: 1 of 13

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
01-02-00067-S001 Loc. 001 – Basement storage room, gray mastic on duct	Homogenous, dark grey/green mastic material	None detected	Non-fibrous material >75%	
01-02-00067-S002 Loc. 001 – Basement storage room, black thermal insulation on sinks	Homogenous, black tar	Chrysotile 1-5%	Non-fibrous material >75%	
01-02-00067-S003 Loc. 003 – Basement machine shop, plasterboard on walls	Homogenous, light tan, hard, cementitious material	None detected	Non-fibrous material >75%	
01-02-00067-S004 Loc. 003 – Basement machine shop, transit panels on wall	Homogenous, grey, hard, cementitious material	Chrysotile 10-25%	Non-fibrous material >75%	
01-02-00067-S005 Loc. 003 – Basement machine shop, aircell on steam supply pipe	Homogenous, off-white, layered, corrugated paper	Chrysotile >75%	Cellulose 10-25% Non-fibrous material 1-5%	
01-02-00067-S006 Loc. 003 - Basement machine shop, parging cement on steam supply elbow	Homogenous, grey, soft, cementitious material	Chrysotile >75%	Non-fibrous material 5-10%	Cotton fabric reinforcement is present on the surface of this sample.

ANALYST:



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey

LAB REFERENCE No: Db5268 – 2008

PREPARED FOR: Steven Moore
Pinchin LeBlanc Environmental Ltd.

DATE: November 20, 2008

PAGE: 2 of 13

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
01-02-00067-S007 Loc. 003 - Basement machine shop, sweat wrap on domestic cold water	Homogenous, brown, layered, corrugated paper	None detected	Cellulose >75%	
01-02-00067-S008 Loc. 004 – Hallway to central steps, FT01, 12"x12" floor tile, white with pink flecks	2 phases: a) Homogenous, white, consolidated material b) Homogenous, black tar	None detected None detected	Non-fibrous material >75% Tar and other non-fibrous material >75%	Vinyl floor tiles may contain very fine asbestos fibres which are not visible using the PLM method. For confirmation of the absence of asbestos, analysis by Transmission Electron Microscopy (TEM) is recommended.
01-02-00067-S009 Loc. 004 – Hallway to central steps, plaster on ceiling (base coat)	Homogenous, tan, granular, cementitious material	Chrysotile	1-5% Non-fibrous material >75%	Paint is present of the surface of this sample.
01-02-00067-S010 Loc. 004 – Hallway to central steps, paper on condensate return pipe	2 phases: a) Homogenous, brown, layered paper b) Homogenous, black tar	None detected Chrysotile	Cellulose >75% Tar and other non-fibrous material >75%	

ANALYST:



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey
01-02-00067
PREPARED FOR: Steven Moore
Pinchin LeBlanc Environmental Ltd.

LAB REFERENCE No: Db5268 – 2008
DATE: November 20, 2008
PAGE: 3 of 13

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
01-02-00067-S011 Loc. 005 – Men's washroom, FT02, 12"x12" floor tile, beige with tan streaks	Homogenous, beige, consolidated material	None detected	Non-fibrous material	>75% Vinyl floor tiles may contain very fine asbestos fibres which are not visible using the PLM method. For confirmation of the absence of asbestos, analysis by Transmission Electron Microscopy (TEM) is recommended.
01-02-00067-S012 Loc. 009 – Room 12, GLP storage, AT01, 2'x2', hole and fleck pattern	Homogenous, tan, layered, compressed fibrous material	None detected	Cellulose Mineral wool Perlite Other non-fibrous material	25-50% 25-50% 5-10% 5-10%
01-02-00067-S013 Loc. 009 – Room 12, GLP storage, drywall joint compound on wall	Homogenous, white, soft, cementitious material	None detected	Non-fibrous material	>75%
01-02-00067-S014 Loc. 15 – Room 09, FT02, 12"x12", beige with brown streaks	2 phases: a) Homogenous, tan, consolidated material b) Homogenous, black tar	None detected None detected	Non-fibrous material Tar and other non-fibrous material	>75% >75% Vinyl floor tiles may contain very fine asbestos fibres which are not visible using the PLM method. For confirmation of the absence of asbestos, analysis by Transmission Electron Microscopy (TEM) is recommended.

ANALYST:



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey
01-02-00067

LAB REFERENCE No: Db5268 – 2008

PREPARED FOR: Steven Moore
Pinchin LeBlanc Environmental Ltd.

DATE: November 20, 2008

PAGE: 4 of 13

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
01-02-00067-S015 Loc. 016 – Server room, FT04, 12"x12", solid blue	Homogenous, blue, consolidated material	None detected	Non-fibrous material >75%	Vinyl floor tiles may contain very fine asbestos fibres which are not visible using the PLM method. For confirmation of the absence of asbestos, analysis by Transmission Electron Microscopy (TEM) is recommended.
01-02-00067-S016 Loc. 017 – Tank room, parging cement on domestic hot water tank	Homogenous, tan, soft, cementitious material	None detected	Mineral wool Non-fibrous material 10-25% >75%	Cotton fabric reinforcement is present on the surface of this sample.
01-02-00067-S017 Loc. 017 – Tank room, parging cement on identified tank	Homogenous, grey, soft, cementitious material	Chrysotile	Non-fibrous material 50-75% 25-50%	Cotton fabric reinforcement is present on the surface of this sample.
01-02-00067-S018 Loc. 022 – Storage archives, FT05, 12"x12", tan with brown and white flecks	2 phases: a) Homogenous, tan, consolidated material b) Homogenous, black tar	None detected Chrysotile 1-5%	Non-fibrous material >75% Tar and other non- fibrous material >75%	Vinyl floor tiles may contain very fine asbestos fibres which are not visible using the PLM method. For confirmation of the absence of asbestos, analysis by Transmission Electron Microscopy (TEM) is recommended.

ANALYST:



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey

LAB REFERENCE No: Db5268 – 2008

PREPARED FOR: Steven Moore
Pinchin LeBlanc Environmental Ltd.

DATE: November 20, 2008

PAGE: 5 of 13

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)			COMMENTS
		ASBESTOS	OTHER		
01-02-00067-S019 Loc. 022 – Storage archives, drywall joint compound on wall	Homogenous, white, soft, cementitious material	None detected	Non-fibrous material	>75%	
01-02-00067-S020 Loc. 024 – Hallway after central steps, parging cement on drain elbow	Homogenous, light grey, soft, cementitious material	Chrysotile	Non-fibrous material	25-50%	Cotton fabric reinforcement is present on the surface of this sample.
01-02-00067-S021 Loc. 030 – Room 104, FT06, 12"x12", white with tan flecks	2 phases: a) Homogenous, white, consolidated material b) Homogenous, black tar	None detected	Non-fibrous material	>75%	Vinyl floor tiles may contain very fine asbestos fibres which are not visible using the PLM method. For confirmation of the absence of asbestos, analysis by Transmission Electron Microscopy (TEM) is recommended.
01-02-00067-S022 Loc. 030 – Room 104, drywall joint compound on wall	Homogenous, white, soft, cementitious material	None detected	Non-fibrous material	>75%	
01-02-00067-S023 Loc. 032 – Room 105, AT02 2'x2', bumpy pattern	Homogenous, tan, layered, compressed fibrous material	None detected	Cellulose Mineral wool Perlite Other non-fibrous material	25-50% 25-50% 1-5% 10-25%	

ANALYST:



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey
01-02-00067

LAB REFERENCE No: Db5268 – 2008

DATE: November 20, 2008

PREPARED FOR: Steven Moore

PAGE: 6 of 13

Pinchin LeBlanc Environmental Ltd.

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
01-02-00067-S024 Loc. 034 – Room 112, freezers, vinyl sheet flooring, beige with blue and grey pattern	Homogenous, beige, consolidated material	None detected	Cellulose Non-fibrous material 10-25% >75%	
01-02-00067-S025 Loc. 038, Room 119, stores, plasterboard over drywall	2 phases: a) Homogenous, white, hard, cementitious material b) Homogenous, light brown, soft, cementitious material with flakes	None detected	Non-fibrous material Vermiculite Other non-fibrous material 5-10% >75%	
01-02-00067-S026 Loc. 052 – Corridor, plaster on wall	2 phases: a) Homogenous, white, hard, cementitious material b) Homogenous, light brown, soft, cementitious material with flakes	None detected	Non-fibrous material Vermiculite Other non-fibrous material 5-10% >75%	

ANALYST:



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey

LAB REFERENCE No: Db5268 – 2008

01-02-00067

DATE: November 20, 2008

PREPARED FOR: Steven Moore
Pinchin LeBlanc Environmental Ltd.

PAGE: 7 of 13

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)			COMMENTS
		ASBESTOS	OTHER		
01-02-00067-S027 Loc. 54 – Room 156, machine shop, plaster on ceiling	2 phases: a) Homogenous, white, hard, cementitious material b) Homogenous, light tan, granular, cementitious material	None detected	Non-fibrous material Cellulose Other non-fibrous material	>75% 0.1-1% >75%	
01-02-00067-S028 Loc. 055 – Room 154, server room, FT07, 12"x12", light grey with dark grey flecks	2 phases: a) Homogenous, light grey, consolidated material b) Homogenous, black tar	None detected	Non-fibrous material	>75%	Vinyl floor tiles may contain very fine asbestos fibres which are not visible using the PLM method. For confirmation of the absence of asbestos, analysis by Transmission Electron Microscopy (TEM) is recommended.
01-02-00067-S029 Loc. 058 – Room 139, electrical room, AT04, 2'x2', pinhole and hole	Homogenous, tan, layered, compressed fibrous material	None detected	Tar and other non- fibrous material	>75%	
01-02-00067-S030 Loc. 058 – Room 139, electrical room, levelling compound at conduit penetration	Homogenous, grey, soft, cementitious material	None detected	Cellulose Mineral wool Perlite Other non-fibrous material	25-50% 25-50% 5-10% 5-10%	
		None detected	Non-fibrous material	>75%	

ANALYST:



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey
01-02-00067

LAB REFERENCE No: Db5268 – 2008

PREPARED FOR: Steven Moore
Pinchin LeBlanc Environmental Ltd.

DATE: November 20, 2008

PAGE: 8 of 13

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)			COMMENTS
		ASBESTOS	OTHER		
01-02-00067-S031 Loc. 049 – Lobby to new section of building, AT03, 2'x2', hole and bumpy pattern	Homogenous, off-white, compressed fibrous material	None detected	Mineral wool Non-fibrous material	>75% 10-25%	
01-02-00067-S032 Loc. 083 – 2 nd floor corridor, plaster on ceiling	2 phases: a) Homogenous, white, hard, cementitious material b) Homogenous, tan, granular, cementitious material	None detected Chrysotile	Cellulose Non-fibrous material Non-fibrous material	0.1-1% >75% >75%	
01-02-00067-S033 Loc. 083 – 2 nd floor corridor, plaster on wall	2 phases: a) Homogenous, white, hard, cementitious material b) Homogenous, tan, granular, cementitious material	None detected Chrysotile	Cellulose Non-fibrous material Non-fibrous material	0.1-1% >75% >75%	
01-02-00067-S034 Loc. 085 – Room 256 and office, drywall joint compound on wall	Homogenous, white, soft, cementitious material	None detected	Non-fibrous material	>75%	

ANALYST:



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey

LAB REFERENCE No: Db5268 – 2008

01-02-00067

DATE: November 20, 2008

PREPARED FOR: Steven Moore
Pinchin LeBlanc Environmental Ltd.

PAGE: 9 of 13

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
01-02-00067-S035 Loc. 086 – Room 254, FT08, 12"x12", white with yellow flecks	Homogenous, cream, consolidated material	None detected	Non-fibrous material >75%	
01-02-00067-S036 Loc. 086 – Room 254, FT09, 12"x12", black with white streaks	Homogenous, black, consolidated material	None detected	Non-fibrous material >75%	Vinyl floor tiles may contain very fine asbestos fibres which are not visible using the PLM method. For confirmation of the absence of asbestos, analysis by Transmission Electron Microscopy (TEM) is recommended.
01-02-00067-S037 Loc 100 – Room 235, marine bioactives lab, fibrous paper debris on wall	Homogenous, off-white, layered paper	Chrysotile 50-75%	Cellulose Non-fibrous material 25-50% 5-10%	
01-02-00067-S038 Loc. 108 – Room 230, AT05, 1'x1', glue on tile, fissure and bumpy pattern	Homogenous, off-white, compressed fibrous material	None detected	Mineral wool Non-fibrous material >75% 10-25%	

ANALYST:



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey

LAB REFERENCE No: Db5268 – 2008

01-02-00067

DATE: November 20, 2008

PREPARED FOR: Steven Moore
Pinchin LeBlanc Environmental Ltd.

PAGE: 10 of 13

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
01-02-00067-S039 Loc. 121 – Corridor and pipe chases, tar paper on duct	2 phases: a) Homogenous, brown, layered paper b) Homogenous, black tar	None detected	Cellulose >75%	
01-02-00067-S040 Loc. 124 -- Room 204, FT10, 12"x12", green and white speckled	Homogenous, grey, consolidated material	None detected	Tar and other non-fibrous material >75%	Vinyl floor tiles may contain very fine asbestos fibres which are not visible using the PLM method. For confirmation of the absence of asbestos, analysis by Transmission Electron Microscopy (TEM) is recommended.
01-02-00067-S041 Loc. 131 – Room 205A, office, plaster on wall	2 phases: a) Homogenous, white, hard, cementitious material b) Homogenous, brown, granular, cementitious material	None detected	Non-fibrous material >75%	
		None detected	Vermiculite Other non-fibrous material >75%	

ANALYST:



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey
01-02-00067

LAB REFERENCE No: Db5268 – 2008

PREPARED FOR: Steven Moore
Pinchin LeBlanc Environmental Ltd.

DATE: November 20, 2008

PAGE: 11 of 13

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
01-02-00067-S042 Loc. 135 – Mass spec room, FT11, 12"x12" white with blue flecks	2 phases: a) Homogenous, white, consolidated material	None detected	Non-fibrous material >75%	Vinyl floor tiles may contain very fine asbestos fibres which are not visible using the PLM method. for confirmation of the absence of asbestos, analysis by Transmission Electron Microscopy (TEM) is recommended.
	b) Homogenous, black tar	None detected	Tar and other non-fibrous material >75%	
01-02-00067-S043 Loc. 143 – Room 218A, GLP chem. stores, plaster on ceiling	2 phases: a) Homogenous, white, hard, cementitious material	None detected	Non-fibrous material >75%	
	b) Homogenous, brown, granular, cementitious material	None detected	Vermiculite 5-10% Other non-fibrous material >75%	
01-02-00067-S044 Loc 145 – Room 224, CRMP GLP lab offices, vinyl sheet flooring, blue/green/red speckled pattern	Homogenous, light grey, consolidated, fibrous material on the back of vinyl sheet flooring	None detected	Cellulose >75% Mineral wool 1-5% Non-fibrous material 10-25%	

ANALYST:



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey

LAB REFERENCE No: Db5268 – 2008

01-02-00067

DATE: November 20, 2008

PREPARED FOR: Steven Moore
Pinchin LeBlanc Environmental Ltd.

PAGE: 12 of 13

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)			COMMENTS
		ASBESTOS	OTHER	OTHER	
01-02-00067-S045 Loc. 189 – Room 304, technology development lab, drywall joint compound on wall	Homogenous, white, soft, cementitious material	None detected	Perlite Other non-fibrous material	5-10% >75%	
01-02-00067-S046 Loc. 210 – Female washroom, plaster on wall	2 phases: a) Homogenous, white, hard, cementitious material b) Homogenous, brown, granular, cementitious material	None detected	Non-fibrous material	>75%	
01-02-00067-S047 Loc. 219 – 3 rd floor passage, plaster board on ceiling (base coat)	Homogenous, light tan, granular, cementitious material	None detected	Cellulose Non-fibrous material	0.1-1% >75%	Paint is present on the surface of this sample.

ANALYST:



BURNSIDE INDUSTRIAL PARK
42 DOREY AVENUE
DARTMOUTH, N.S.
B3B 0B1

BULK SAMPLE ANALYSIS

PROJECT NAME: National Research Council
ACM Survey
01-02-00067
PREPARED FOR: Steven Moore
Pinchin LeBlanc Environmental Ltd.

LAB REFERENCE No: Db5268 – 2008
DATE: November 20, 2008
PAGE: 13 of 13

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
01-02-00067-S048 Loc. 219 – 3 rd floor passage, plaster board on wall	2 phases: a) Homogenous, white, hard, cementitious material b) Homogenous, tan, granular, cementitious material	None detected Chrysotile	>75% 1-5% >75%	
01-02-00067-S049 Loc. 230 – Room 341A, texture coat on roof drain	Homogenous, black tar, impregnated with brown, consolidated material	None detected	>75%	Paint is present on the surface of this sample.
01-02-00067-S050 Loc. 225 – 4 th floor chiller room, FT12, 9"x9", white with grey specks	2 phases: a) Homogenous, tan, consolidated material b) Homogenous, black tar	None detected None detected	>75% >75%	Vinyl floor tiles may contain very fine asbestos fibres which are not visible using the PLM method. for confirmation of

ANALYST:

APPENDIX II

SAMPLE LOCATIONS DRAWING



LEGEND:



PINCHIN LOCATION NUMBER



ASBESTOS SAMPLE NUMBER



CLIENT:

NATIONAL RESEARCH COUNCIL LTD.

PROJECT:

ACM SURVEY

SITE ADDRESS:

NATIONAL RESEARCH COUNCIL FACILITY
1411 OXFORD STREET, HALIFAX,
NOVA SCOTIA

DRAWING NAME:

SAMPLE LOCATIONS
BASEMENT

REFERENCE:

NATIONAL RESEARCH COUNCIL LTD.

DATE:

NOVEMBER 2008

PROJECT #:

01 - 02 - 00067

SCALE:

N.T.S.

FIGURE#:

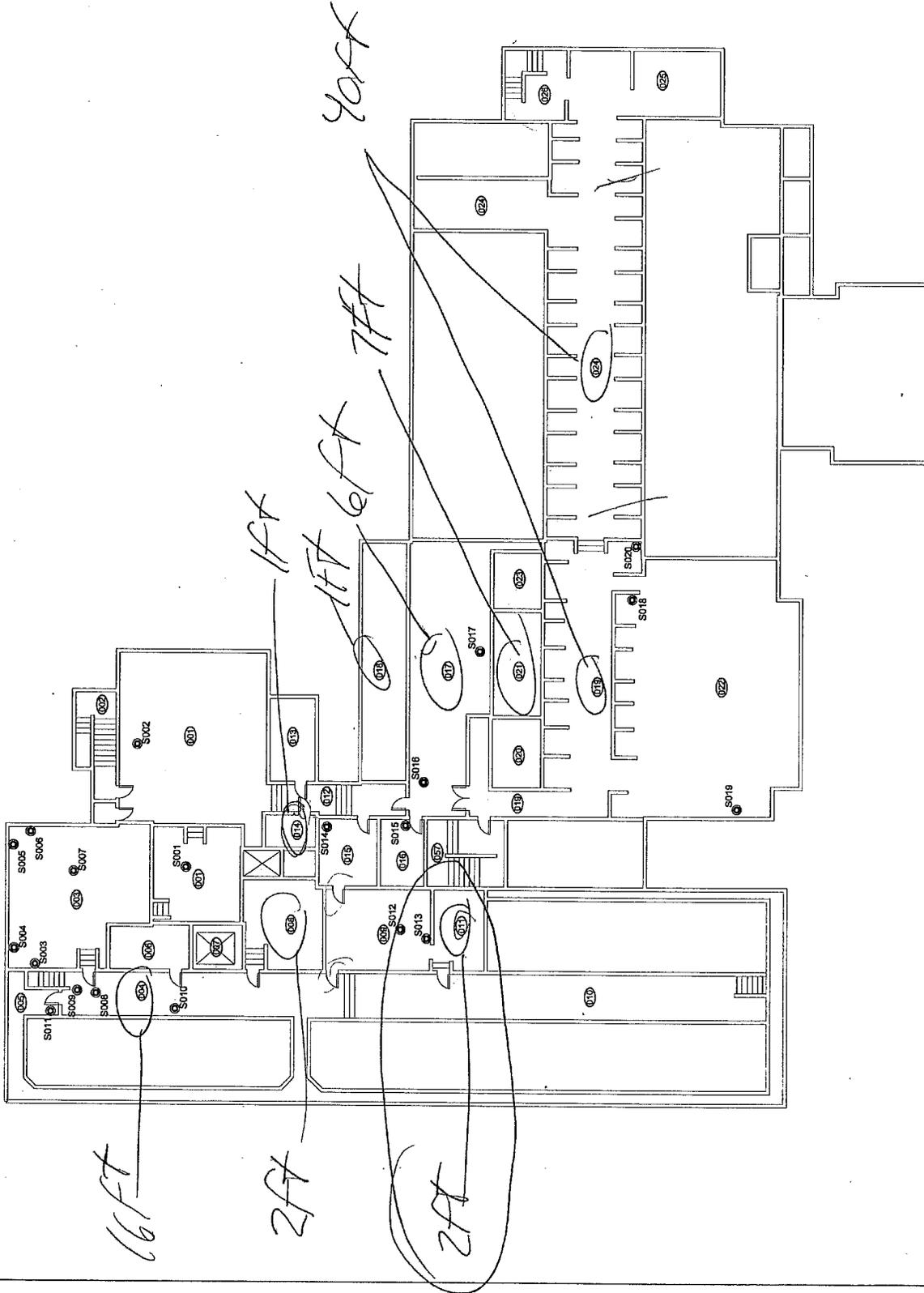
DRAWN BY:

S. ANISCIKLI

CHECKED BY:

S. MOORE

1





LEGEND:



PINCH LOCATION NUMBER



ASBESTOS SAMPLE NUMBER



CLIENT:

NATIONAL RESEARCH COUNCIL
LTD.

PROJECT:

ACM SURVEY

SITE ADDRESS:

NATIONAL RESEARCH COUNCIL
FACILITY
1411 OXFORD STREET, HALIFAX,
NOVA SCOTIA

DRAWING NAME:

SAMPLE LOCATIONS
FIRST FLOOR

REFERENCE:

NATIONAL RESEARCH COUNCIL
LTD.

DATE:

NOVEMBER 2008

PROJECT #:

01 - 02 - 00067

SCALE:

N.T.S.

FIGURE#:

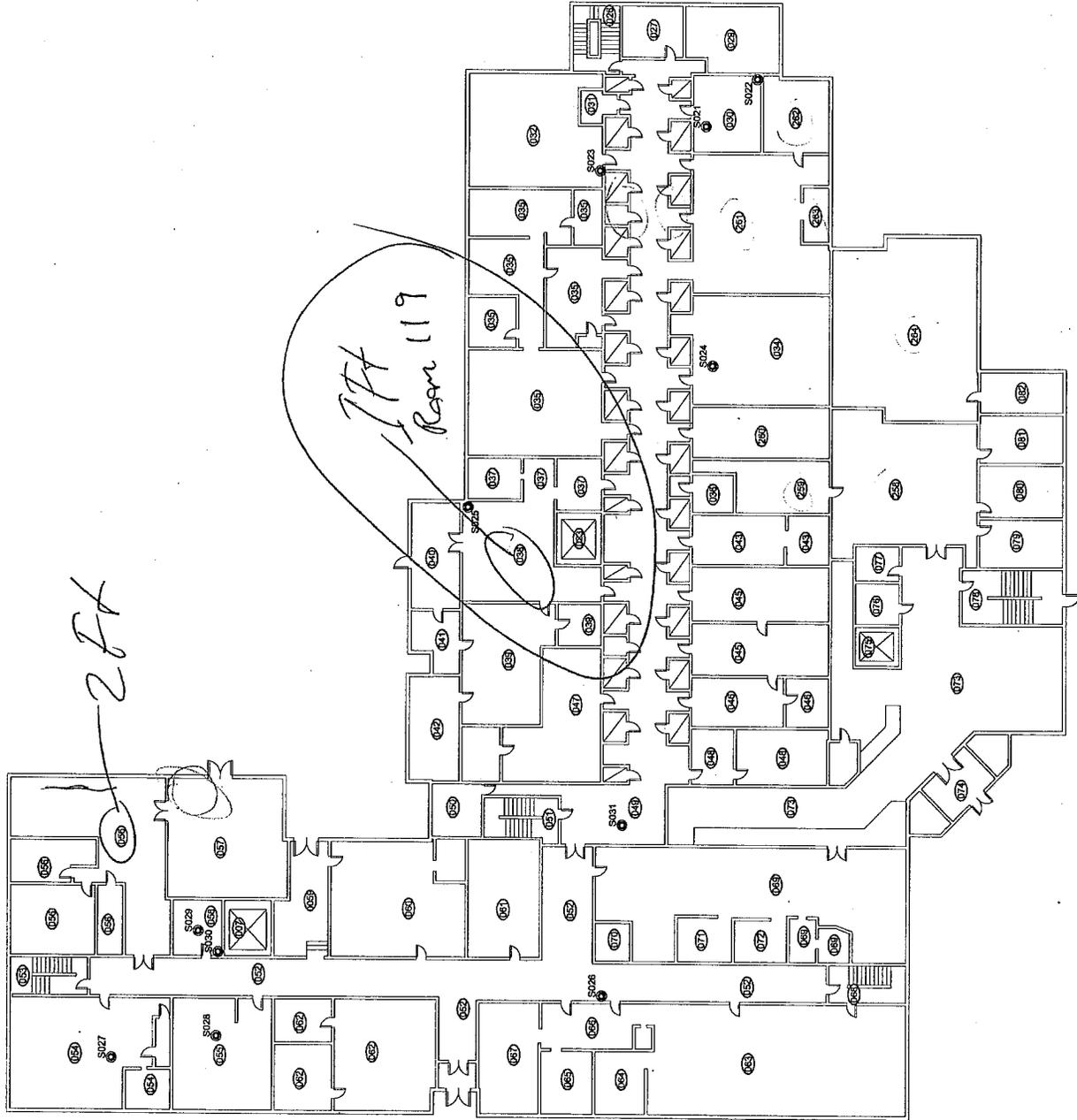
2

DRAWN BY:

S. ANISCIKLI

CHECKED BY:

S. MOORE





LEGEND:



PINCHIN LOCATION NUMBER



ASBESTOS SAMPLE NUMBER



CLIENT:

NATIONAL RESEARCH COUNCIL LTD.

PROJECT:

ACM SURVEY

SITE ADDRESS:

NATIONAL RESEARCH COUNCIL FACILITY
1411 OXFORD STREET, HALIFAX,
NOVA SCOTIA

DRAWING NAME:

SAMPLE LOCATIONS
SECOND FLOOR

REFERENCE:

NATIONAL RESEARCH COUNCIL LTD.

DATE:

NOVEMBER 2008

PROJECT #:

01 - 02 - 00067

SCALE:

N.T.S.

FIGURE#:

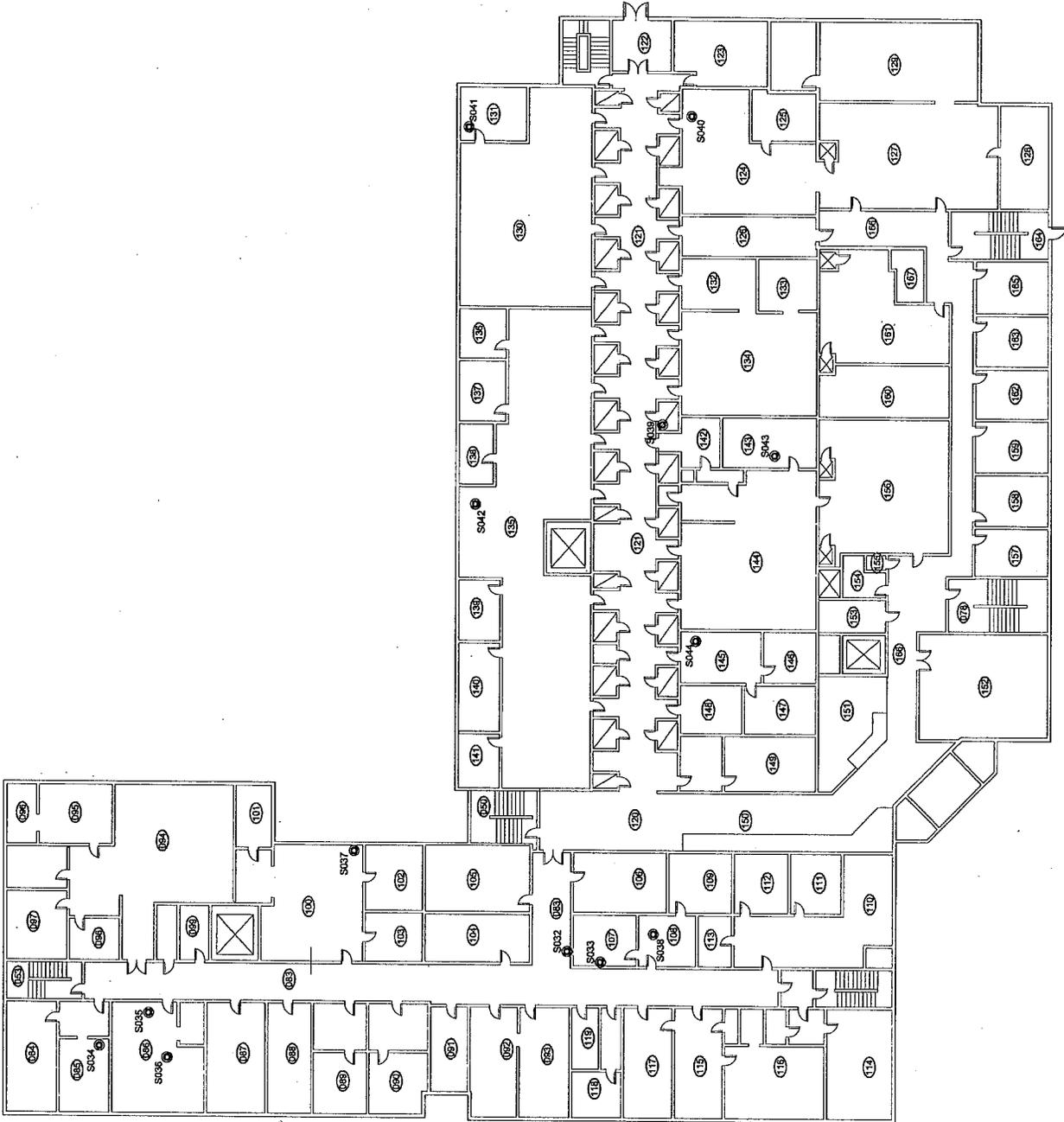
3

DRAWN BY:

S. ANISCIKLI

CHECKED BY:

S. MOORE





LEGEND:
XXX PINCHIN LOCATION NUMBER
© ASBESTOS SAMPLE NUMBER



CLIENT:
NATIONAL RESEARCH COUNCIL
LTD.

PROJECT:
ACM SURVEY

SITE ADDRESS:
NATIONAL RESEARCH COUNCIL
FACILITY
1411 OXFORD STREET, HALIFAX,
NOVA SCOTIA

DRAWING NAME:
SAMPLE LOCATIONS
THIRD FLOOR

REFERENCE:
NATIONAL RESEARCH COUNCIL
LTD.

DATE:
NOVEMBER 2008

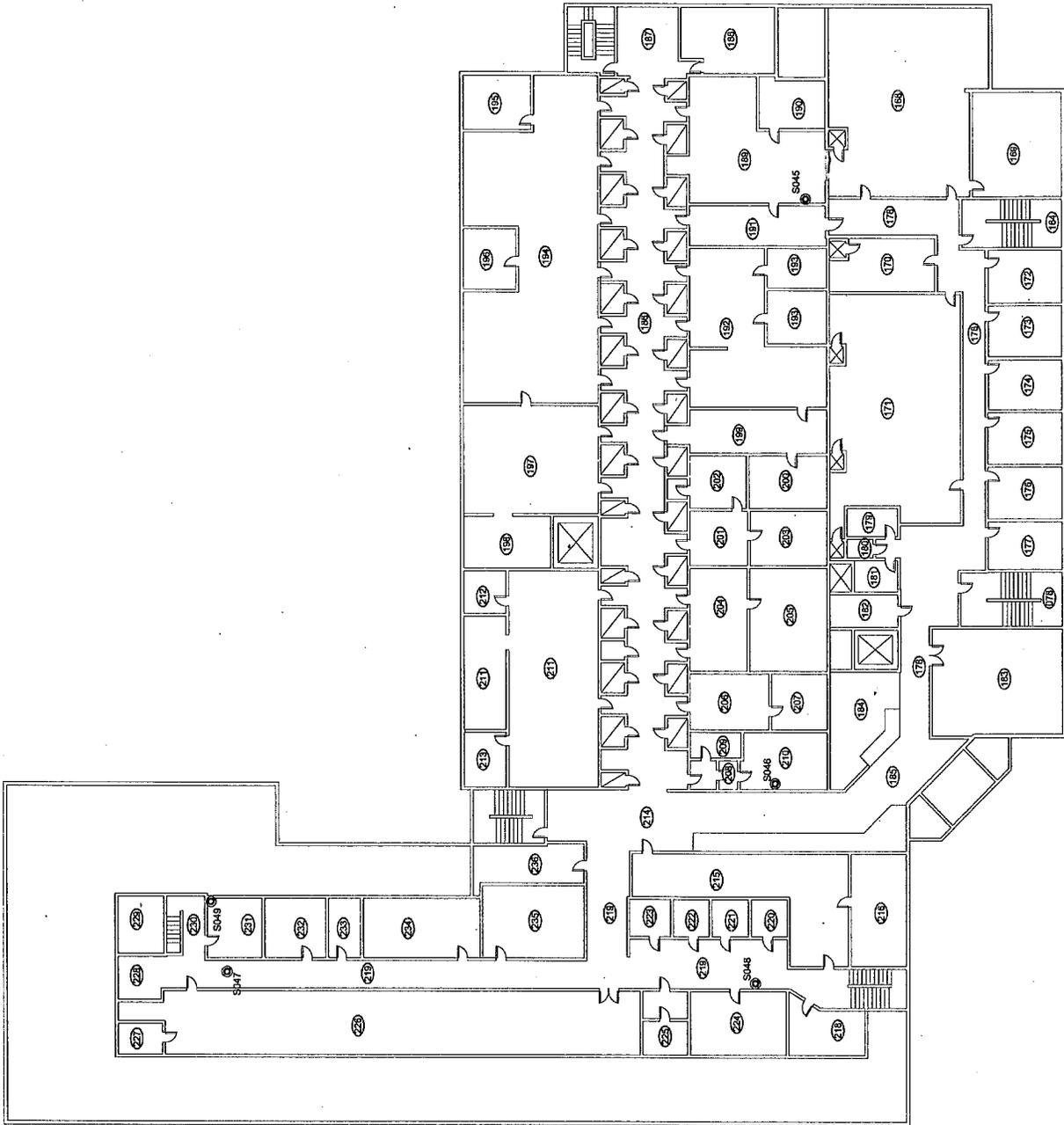
SCALE:
N.T.S.

DRAWN BY:
S. ANISCIKLI

CHECKED BY:
S. MOORE

PROJECT #:
01 - 02 - 00067

FIGURE #:
4





LEGEND:



PINCHIN LOCATION NUMBER



ASBESTOS SAMPLE NUMBER



CLIENT:

NATIONAL RESEARCH COUNCIL LTD.

PROJECT:

ACM SURVEY

SITE ADDRESS:

NATIONAL RESEARCH COUNCIL FACILITY
1411 OXFORD STREET, HALIFAX,
NOVA SCOTIA

DRAWING NAME:

SAMPLE LOCATIONS
FOURTH FLOOR

REFERENCE:

NATIONAL RESEARCH COUNCIL LTD.

DATE:

NOVEMBER 2008

PROJECT #:

01 - 02 - 00067

SCALE:

FIGURE#:

N.T.S.

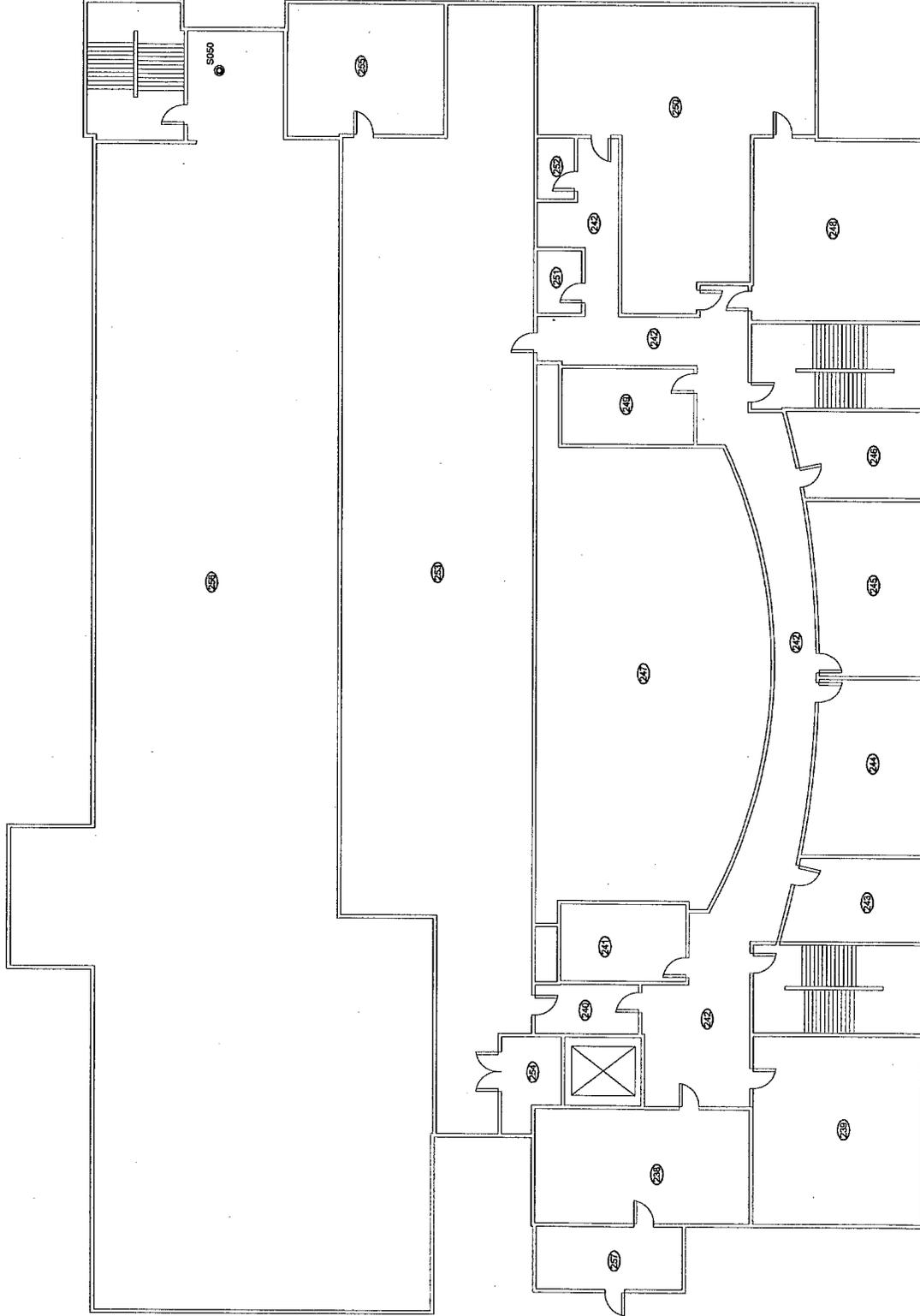
DRAWN BY:

S. ANISCIKLI

CHECKED BY:

S. MOORE

5



APPENDIX III

PHOTOGRAPHS



Photo 01 – Thermal sink insulation on the underside of a sink, basement storage room (location 001, sample 01-02-67-S002).

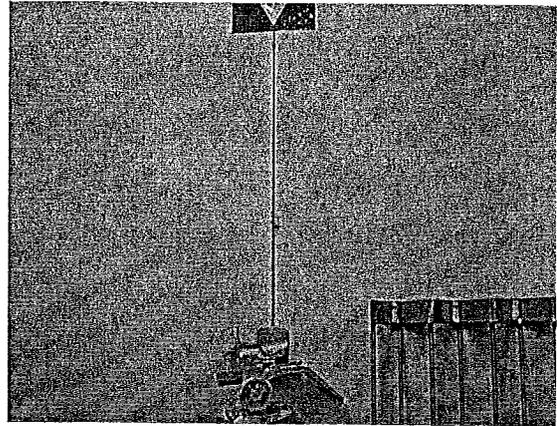


Photo 02 – Transite panels on the walls, basement machine shop (location 003, sample 01-02-67-S004).

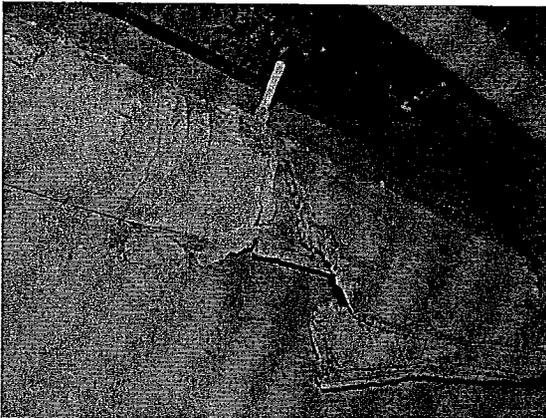


Photo 03 – Aircell pipe insulation on a steam supply line, basement machine shop (location 003, sample 01-02-67-S005).



Photo 04 – Parging cement on steam supply fittings, basement machine shop (location 003, sample 01-02-67-S006).



Photo 05 – Plaster on ceiling, basement west corridor (location 004, sample 01-02-67-S009).

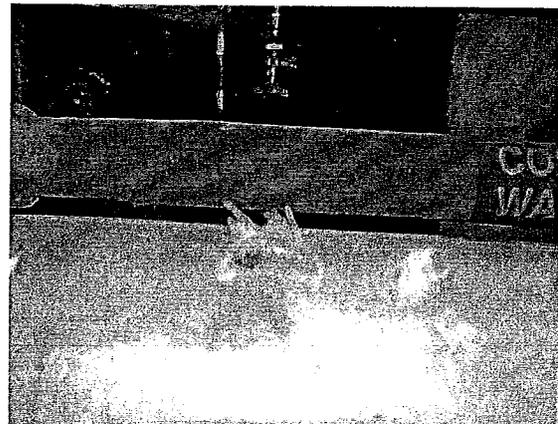


Photo 06 – Paper covering tar on condensate return line, basement west corridor (location 004, sample 01-02-67-S010).

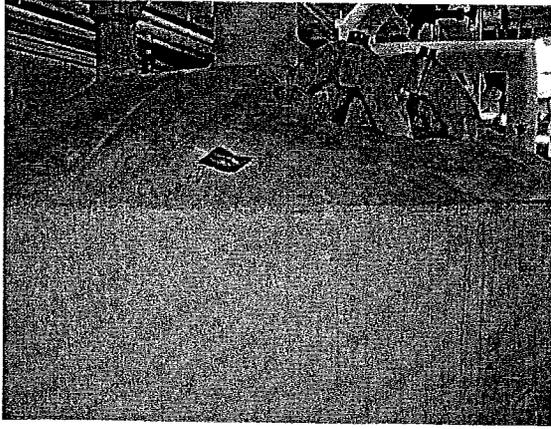


Photo 07 – Parging cement on steam pressure tank, tank room (location 017, sample 01-02-67-S017).

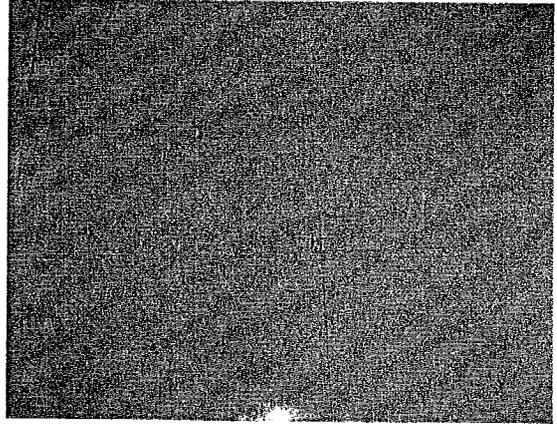


Photo 08 – FT-05, 12"x12", tan with white and brown flecks, storage archives (location 022, sample 01-02-67-S018).

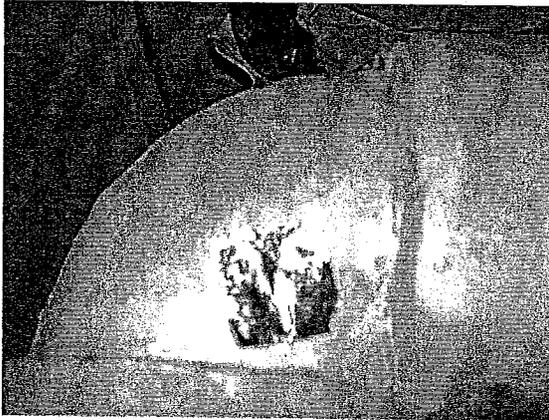


Photo 09 – Parging cement on drain line elbow, basement east hallway (location 024, sample 01-02-67-S020).

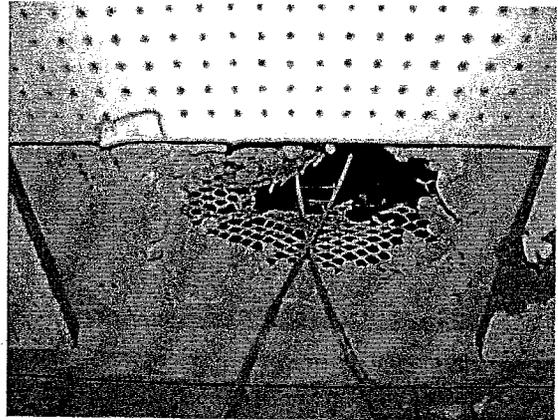


Photo 10 – Plaster on ceiling, 2nd floor west corridor (location 083, sample 01-02-67-S032).

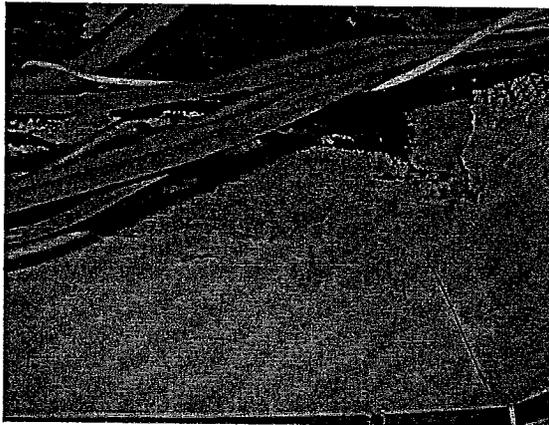


Photo 11 – Plaster on wall, 2nd floor west corridor (location 083, sample 01-02-67-S033).

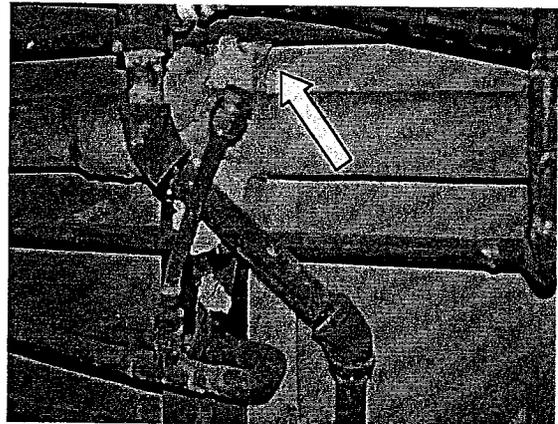


Photo 12 – Fibrous paper debris in pipe chase, Room 235 (location 100, sample 01-02-67-S037).

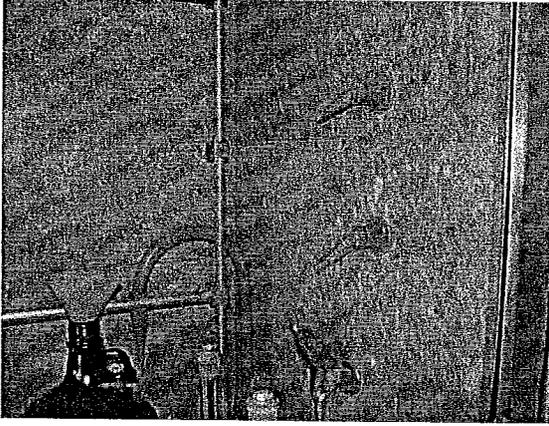


Photo 13 – Typical view of Transite panels in a fume hood.

