



EXCELLENCE IN
ENVIRONMENTAL
CONSULTING
SERVICES

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**DESIGNATED SUBSTANCES AND HAZARDOUS MATERIALS SURVEY
BUILDINGS WW05, WW06, WW08, WW09, WW10, WW11
WARKWORTH INSTITUTION
CAMPBELLFORD, ONTARIO
PWGSC PROJECT #: R.033222.001**

Prepared for:

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ES 1. EXECUTIVE SUMMARY

XCG Consultants Ltd. (XCG) was retained by Public Works and Government Services Canada (PWGSC), acting on behalf of Correctional Service of Canada (CSC) to survey the areas that will be affected by proposed renovations to ventilation and piping systems at buildings WW05, WW06, WW08, WW09, WW10 and WW11 at the Warkworth Institution in Campbellford, Ontario for designated substances and hazardous materials (DSHM). PWGSC requires a DSHM survey to identify the presence and/or extent of designated and hazardous materials prior to conducting the renovations. The survey was consistent with the requirements of the Occupational Health and Safety Act of Ontario, and provides information to assist with the management of DSHM's during the renovations.

The survey included all of the Designated Substances defined by the Ontario Occupational Health and Safety Act, with particular emphasis placed on (but not limited to): asbestos-containing materials (ACMs); lead-based paints, wiring and plumbing; mercury-containing equipment; and potential sources of silica. The hazardous materials surveyed included: PCB-containing equipment; ozone-depleting substances (ODSs); urea formaldehyde foam insulation (UFFI); fuel, oil and/or waste oil storage; chemical storage; radioactive materials; bird and animal droppings; and mould.

XCG conducted the DSHM survey of the subject area on March 22, 2010 and March 24, 2010.

Asbestos-Containing Materials (ACMs)

The following confirmed and suspected asbestos-containing materials were identified during the DSHM survey: pipe elbow insulation, 9" x 9" grey floor tiles, and fire damper gasket inside buried spiral ductwork. All of the asbestos-containing materials that were identified as part of the DSHM Survey should be managed in accordance with Ontario Regulations 837 (amended to O. Reg. 490/09) and O. Reg. 493/09. Based on the analytical and visual observations made during the survey, all plaster pipe elbows, and fire damper gaskets in the buried spiral ductwork should be assumed to be asbestos containing.

Recommendations for remedial actions with respect to the asbestos-containing materials identified in the building were based on the exposure and accessibility of the friable ACMs and on XCG's understanding of the contemplated renovation works.

Based on the confirmation of asbestos in the 9" x 9" grey floor tiles in WW06, if the floor tiles will be disturbed as part of the renovations, it is XCG's recommendation that they be removed using under Type 1 conditions outlined in O. Reg. 278/05 (amended to 493/09). Type 1 operations are required if "*Installing or removing non-friable asbestos-containing material, other than ceiling tiles, if the material is installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.*" (Section 12.(2)2).



Based on the confirmation of asbestos in the plaster pipe elbows and fire damper gaskets in the buried spiral ductwork, XCG recommends that all hard plaster elbows present in the surveyed buildings be considered asbestos-containing. If these materials are to be disturbed as part of the renovation activities, they should be removed under Type 2 or Type 3 conditions as outlined in O. Reg. 278/05 (amended to 493/09) depending on the quantity of elbows and/or fire damper gaskets.

As stated in O. Reg. 278/05 (amended to 493/09) the act of “*Removing insulation that is asbestos-containing material from a pipe, duct or similar structure using a glove bag.*” (Section 12.(3)9) is required to be completed under Type 2 conditions.

As stated in O. Reg. 278/05 (amended to 493/09), “*The following are Type 3 operations: 1. The removal or disturbance of more than one square metre of friable asbestos-containing material during the repair, alteration, maintenance or demolition of all or part of a building, aircraft, ship, locomotive, railway car or vehicle or any machinery or equipment.*” (Section 12.(4)1).

It should be noted that no immediate safety hazards were identified with respect to the materials identified, with the exception of one (1) plaster elbow in room 114 of building WW06 that was observed to be damaged. All asbestos abatement should be conducted by contractors licensed and insured for this type of abatement work. Disposal of the ACM waste should be conducted by a licensed contractor at a facility that accepts such waste.

Lead-Containing Materials

It is worth noting that the majority of proposed renovation areas were observed to be unpainted. However, lead-based paints were identified as being present in the proposed renovation area in building WW06. The lead-based paint in building WW06 was identified as being white paint (7,006 ppm of lead) present in Room 101 on the upper half of the corridor as noted in the 2005 DSHM survey. In addition, cream paint from Room 115 in WW06 was identified as having a lead concentration of 490 ppm. It should be noted that matrix interference occurred during analysis and the concentration of lead in the sample may be greater than 490 ppm. In the event that the wall and ceiling of Room 115 in building WW06 is to be disturbed than an additional sample of paint should be collected and submitted for laboratory analysis for lead prior to renovation activities. All other renovation areas did not have any identified lead-based paint.

All lead-based paint should be managed in accordance with Regulation 843 (amended to O. Reg. 109/04) during all renovation activities. Workers are not at risk of being exposed to lead unless they are undertaking an activity that disturbs surfaces covered with lead-based paint. According to the Ontario Ministry of Labour “*Guideline - Lead on Construction Projects*”, dated September 2004, construction operations regarding lead have been classified in a similar manner to those projects regarding asbestos. This document is a guideline for best practices.

According to this document, “*manual demolition of lead-painted plaster walls or building components by striking a wall with a sledge hammer or similar tool*” is



classified as a Type 2a operation, requiring workers to wear protective clothing and an appropriate respirator. Removal of lead-containing coatings or materials by scraping or sanding with a non-powered hand tools also should be undertaken using Type 2a operations. In the event that the painted surface is not to be disturbed no action is required since the paint was identified as being in good condition at the time of the survey.

It is possible that lead-containing solder is present in areas of the proposed renovations. All solder on plumbing should be treated as lead-based, and should be managed in accordance with O. Reg. 843 (amended to 490/09) during renovation activities. If the materials are not to be recycled, the materials should be disposed of in accordance with Regulation 347.

Mercury-Containing Equipment

The only potential sources of mercury identified during the survey were fluorescent light tubes and thermostats. There is no occupational or environmental concern associated with mercury in its current state and condition. Exposure to mercury is regulated under O. Reg. 844/90 (amended to 490/09). Where possible, fluorescent light tubes should be recycled at an approved recycling facility.

Silica

Sources of silica observed during the survey included concrete and cinder blocks. No free silica was identified. Exposure to airborne silica is regulated under Ontario Regulation 845/90 (amended to 490/09) regarding silica under the Occupational Health and Safety Act. Airborne silica can be generated through such processes as blasting, grinding, crushing, and sandblasting silica-containing material. Precautions must be taken to prevent silica-containing particles from becoming airborne during the application of such processes. Such precautions include wetting of silica-containing area(s) to be disturbed and daily wet sweeping or HEPA vacuuming of silica dust. Additionally, appropriate respiratory protection and ventilation must be utilized during disturbance of silica-containing structures.

Polychlorinated Biphenyls (PCBs)

The only potential sources of PCBs identified during the survey were the fluorescent light ballasts identified in the renovation areas. The 2005 investigation indicated that the majority of fluorescent light fixtures have been replaced prior to the 2005 survey however there is a possibility that some of the light fixtures contain PCB-containing ballasts. XCG was unable to remove the plate covers and inspect the ballasts at the time of the survey. In the event that a fixture is to be removed during the renovation, the ballast should be inspected to determine if it is PCB-containing.

Ozone-Depleting Substances

Ozone depleting substances were not identified in the proposed renovation areas in any of the buildings.

It should be noted that disposal of any refrigeration equipment and/or refrigerant containers is regulated under O. Reg. 189/94 (amended to 180/07). In accordance



with O. Reg. 189/94, any removal and/or disposal of refrigeration equipment during demolition activities should only be undertaken by individuals who hold ozone depletion prevention cards.

UFFI

There are no recommendations with respect to UFFI, because no materials suspected to be UFFI were identified during the survey.

Bird and Animal Droppings

No bird or animal droppings were noted within the building.

Mould

A minor quantity (1 m²) of mould was identified in one location during the survey in Room 114 in Building WW06. Mould was not identified in any of the other proposed renovation areas during the survey.

As a precaution, the suspected mould should be analyzed to determine if it is in fact mould. Although there are no Ontario Regulations specifically addressing moulds, during renovation activities, operating procedures should be in place to protect the health and safety of the workers that may be exposed to fungal contamination. Precautions must be taken to prevent fungi from becoming airborne. Such precautions include wetting of fungal area(s) that are to be disturbed. Additionally, appropriate respiratory protection and ventilation must be utilized during disturbance of fungal contamination.

Renovation activities should be consistent with the requirements of the Occupational Health and Safety Act of Ontario and the guidelines issued by the Ontario Ministry of Labour for workers who may be exposed to mould issued in a “*Hazard Alert*” fact sheet in December 2000 entitled, “*Mould in Workplace Buildings*.” Standard Construction Document CCA 82 2004, “*Mould Guidelines for the Canadian Construction Industry*” as well as Environmental Abatement Council of Ontario (EACO) 2004 publication “*Mould Abatement Guidelines*”, should also be reviewed and the best management practices followed with respect to mould abatement.

Other Designated Substances

None of the following designated substances were noted within the buildings: acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride. Therefore, no mitigative measures relating to these substances are required.



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1. INTRODUCTION

XCG Consultants Ltd. (XCG) was retained by Public Works and Government Services Canada (PWGSC), acting on behalf of Correctional Service of Canada (CSC), to survey the areas that will be affected by contemplated renovations to ventilation and piping systems at buildings WW05, WW06, WW08, WW09, WW10 and WW11 at the Warkworth Institution in Campbellford, Ontario for designated substances and hazardous materials (DSHM). An overall site plan is included in Appendix A. Please refer to Figure 1.

1.1 Background

On behalf of CSC, PWGSC is coordinating renovations to the existing ventilation and piping systems at the above-referenced buildings. According to the TOR, the buildings were constructed in the mid-1960s. Each living unit building complex (WW08, WW09, WW10 and WW11) is a two-storey structure with three (3) wings described as ranges A, B, C, E and F & G (upper and lower elevations). Each range provides accommodation for seventeen (17) inmates for a total of 102 inmates per complex. Each cell unit has one water closet and one single basin sink with piping riser systems located in enclosed vertical shafts between two adjacent cell units. It is understood that similar contemplated renovations are to take place at WW05 and WW06. Based on discussions with PWGSC and CSC staff, the areas that will be affected by the contemplated renovations include the vertical shafts (pipe chases) between pairs of cell units, the attic spaces above the ranges and their associated mechanical room(s).

The survey was consistent with the requirements of the Occupational Health and Safety Act of Ontario, and will provide information to assist with the management of DSHM during the renovations.

1.2 Scope of Work

As outlined in XCG's proposal entitled, "Proposal for Designated Substances and Hazardous Materials Survey, Four Living Unit Buildings, Intensive Support Building and Segregation Building, Warkworth Institution, Campbellford, Ontario" dated March 9, 2010, the scope of work for the DSHM Survey portion was as follows.

- Review all supplied information including:
 - Reports and drawings pertinent to the areas of interest.
 - Copy of the building floor plan.
- Complete a DSHM survey of the proposed renovation areas inside Buildings WW05, WW06, WW08, WW09, WW10 and WW11 as required for the proposed works;
- Prepare a survey report and provide estimated quantities and recommendations for the mitigation of all designated substances and hazardous materials identified.

The survey included all of the Designated Substances defined by the Ontario Occupational Health and Safety Act, with particular emphasis placed on (but not limited to):



- Asbestos-containing materials (ACMs);
- Lead based paints, wiring, and plumbing (including solder);
- Mercury-containing equipment; and
- Potential sources of silica.

Hazardous materials that were included in the survey were:

- PCB-containing equipment;
- Ozone-depleting substances (ODSs);
- Urea formaldehyde foam insulation;
- Bird and animal droppings; and
- Mould.

1.3 Project Team

In the performance of this DSHM survey, XCG's project team comprised the following staff:

- Mr. Kevin Shipley, M.A.Sc., P.Eng., CEA, CEAS, QPRA
 - Senior Peer Reviewer
- Mr. Dale White
 - Senior Technologist
- Mr. Cameron Pritchett, B.A.Sc
 - Project Specialist
- Mr. Greg Mallette, C.E.T.
 - Project Specialist

This project team was selected due to experience with DSHM surveys. XCG used a small project team in order to maintain continuity within the project and minimize duplications during inspections and sampling efforts.

1.4 Report Format

This report is divided into ten sections with the first being this introduction. Section 2 presents general information regarding designated substances and hazardous materials, such as manufacturing history, health affects and regulatory information. Section 3 documents the methods used in the investigation. The results of the DSHM survey for buildings WW05, WW06, WW08, WW09, WW10, WW11 are presented in Section 4 through to Section 9, respectively. Recommendations in terms of construction and removal procedures for the designated substances and hazardous materials identified are documented in Section 10.



The annotated floor plans showing the sampling locations are contained in Appendix A. The laboratory certificates of analysis are included in Appendix B. Photographs collected during the survey are included in Appendix C.

1.5 **Limitations**

The findings of this report are based upon visual observations and a visual survey of accessible areas within the proposed work areas of Buildings WW05, WW06, WW08, WW09, WW10 and WW11 at the Warkworth Institution in Campbellford, Ontario. The survey was only conducted in the areas of the proposed upgrades defined in the RFP Scope of Work. Based on discussions with PWGSC and CSC staff, the areas that will be affected by the contemplated renovations include the vertical shafts (pipe chases) between pairs of cell units, the attic spaces above the ranges and their associated mechanical room(s). It is noted that only general information was provided to XCG regarding the proposed renovation areas—no detailed plans relating to the renovations were available for review.

The visual inspections were primarily limited to a survey of structures in areas with reasonable accessibility. While every attempt was made to ensure that samples collected were representative of the general sampling area, it is possible that conditions outside specific sampling locations may differ. Therefore, users of this report are advised to observe conditions prior to conducting any repairs, removal, or renovation/demolition. XCG cannot be held responsible for conditions that were not apparent from documentation supplied to XCG.

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

The scope of this report is limited to the matters expressly covered. This report was prepared for the sole benefit of Public Works Government Services Canada (PWGSC), Correctional Services Canada (CSC), and may not be relied upon by any other person or entity without the written authorization of XCG Consultants Limited. Any use or reuse of this document (or findings, conclusions, or recommendations represented herein), by parties other than PWGSC and CSC is at the sole risk of those parties.



2. DSHMS GENERAL INFORMATION

This section of the report provides general information, such as manufacturing history, health effects and regulatory information, regarding some of the more commonly occurring designated substances and hazardous materials surveyed.

2.1 Asbestos-Containing Materials (ACMs)

The term asbestos encompasses a group of naturally occurring fibrous hydrated silicates that are identified by their long thin fibres. The commercially important members of the asbestos family are actinolite, amosite, anthophyllite, chrysotile, crocidolite, and tremolite.

Asbestos has been commonly used in commercial and industrial applications since the late 1800s. Asbestos has been used in insulation, fireproofing, floor tiles, ceiling tiles, cement piping, and corrugated pipe insulating wrap because of its incombustibility, heat resistance, chemical resistance, and reinforcing properties.

Health concerns related to airborne friable asbestos fibres, which include the diseases called asbestosis, mesothelioma, and lung cancer, resulted in a ban of its use in construction materials in 1973. Disposal of asbestos waste is governed by Environmental Protection Act – R.R.O. 1990, Regulation 347 (amended to O. Reg. 461/06). The Transportation of Dangerous Goods Act and Regulations prescribe additional requirements related to the transportation of asbestos waste. Under Occupational Health and Safety Act (OHSA) – R.R.O. 1990, Regulations 837 (amended to O. Reg. 490/09) and O. Reg 493/09 respecting asbestos, ACM is defined as a material containing 0.5% or more of asbestos. Friable ACM shall be repaired, sealed, removed, or encapsulated.

As indicated above, any material that is found to have an asbestos content of 0.5% or greater is considered to be an asbestos-containing material. However, friable samples that are found to contain asbestos at a level above the laboratory detection limit but below 0.5% are treated as asbestos-containing as well, as a reasonable precaution to maximize protection of worker health and safety. Non-friable samples containing asbestos below 0.5% are considered non-asbestos-containing.

2.2 Lead-Based Paints

Lead is a heavy metal and is typically found in inorganic compounds often occurring as components of products such as insecticides, pigments, paints, and glass.

Lead exposure is a particular concern from lead paint dust during renovation, demolition, or construction activities, or from deterioration of wall coverings. The 1975 Hazardous Products Act prohibited the use of lead-based pigments in interior consumer paint. The Liquid Coating Material Regulation under the Federal Hazardous Products Act (1976) limited the quantity of lead permissible in newly manufactured paints to 0.5% (5,000 ppm). However, on April 19, 2005, the Surface Coating Materials Regulations came into force, thereby amending Schedule I of the Hazardous Products Act. According to the new regulation, paints having a lead content greater than 600 mg/kg (600 ppm) are considered to



be lead-based. Lead exposure can result in damage to the kidneys, nervous system, and reproductive system.

Although there are not criteria for allowable concentrations of lead in dust in Canada, the quantity of lead identified at the subject property was well below the United States Department of Housing and Urban Development (HUD) clearance sample guideline of 100 $\mu\text{g}/\text{ft}^2$.

Under the OHSA Regulation 843 (amended to O. Reg. 490/09) respecting lead, workers shall be protected from exposure to airborne lead. Workers are not at risk of being exposed to lead unless they are undertaking an activity that disturbs surfaces covered with lead-based paint. Special precautions are required during renovation or demolition activities to ensure that worker exposure to lead does not exceed the limits specified in the Occupational Health and Safety Act, and its associated regulations.

2.3 Lead-Containing Materials

Lead can also be found in metallic lead used to make pipes, electrical batteries, lead solder, and electric cable sheaths.

Lead-containing materials are a concern as lead can enter into drinking water primarily as a result of the corrosion, or wearing away, of these materials if these materials are associated with the plumbing. These materials include lead-based solder used to join copper pipe, brass and chrome-plated brass faucets, and in some cases, pipes made of lead that connect to the water main.

2.4 Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are a group of chemicals based on a combination of chlorine and a derivative of benzene called biphenyl. PCBs have been used as non-flammable cooling oils in electrical transformers, hydraulic equipment, capacitors, and other electrical equipment. Other uses were as a plasticizer in sealant, caulking, synthetic resins, rubber, paints, waxes, and asphalt, and a flame retardant in lubricating oils. Health concerns over PCBs, including their potential as carcinogens, resulted in the ban of their manufacture in 1977.

Equipment containing solids or fluids with a polychlorinated biphenyl (PCB) concentration greater than 50 ppm is considered to be PCB-containing.

Under Federal Regulation SOR/2008-273, deadlines have now been imposed on the elimination of all PCBs and PCB-containing material currently in storage, and the phasing out of all in-service equipment containing PCBs. For PCB-containing equipment currently in use, the deadlines for decommissioning and disposal of this equipment range from December 31, 2009, to December 31, 2025, depending on the location of the subject property and the concentration of PCBs in the equipment.

2.5 Ozone-Depleting Substances

The following substances are ozone-depleting substances (ODSs):



- Chlorofluorocarbons (CFCs) - CFCs have been widely used in refrigerants, aerosol repellents, and foam insulation;
- Halons - halons are chemicals composed of brominated fluorocarbons, and have been used in fire extinguishing equipment; and
- Other products - methyl chloroform and carbon tetrachloride have been used mainly in industry as degreasers and adhesives, and for chemical processing.

Due to the nature of ODSs and their potential impact to the environment, their use, transport, storage, and disposal is strictly enforced. Canada's current position on CFCs is to freeze production by January 1996 and complete elimination by 2020. The Federal Halocarbon Regulations (SOR/99-255) assist in the development of strategic plans for the use, control and phase-out of ODSs and their halocarbon alternatives for operations under federal jurisdiction.

2.6 **Mercury-Containing Equipment**

Mercury is a naturally occurring metal that has several forms. The metallic mercury is a shiny, silver-white, odourless liquid. If heated, it produces a colourless, odourless gas.

Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, fluorescent light tubes, dental fillings, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.

The nervous system is very sensitive to all forms of mercury. Methylmercury and metallic mercury vapours are more harmful than other forms, because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems.

Short-term exposure to high levels of metallic mercury vapours may cause effects including lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes and eye irritation.

2.7 **Silica**

Silica is the name of a group of minerals containing silicon and oxygen. Crystalline silica is often used in building materials such as concrete, masonry products, stone, terrazzo flooring, refractory brick and ceramic tiles. Airborne crystalline silica occurs commonly in work and non-work environments. Activities such as drilling, quarrying brick/block/concrete cutting and demolition activities can create an airborne silica exposure hazard. Inhalation of silica can produce silicosis, a disabling, dust-related disease of the lungs. Depending on the length of exposure, silicosis is a progressive and many times a fatal disease. Inhaling silica dust has also been associated with other diseases, such as tuberculosis and lung cancer.



2.8 **Urea Formaldehyde Foam Insulation (UFFI)**

Urea formaldehyde foam insulation (UFFI) is a low-density foam prepared from a mixture of urea formaldehyde resin, an acid hardening agent solution, and a propellant. UFFI was often used to insulate homes. The white, blue, or cream coloured foam was typically injected into open cavities behind walls. The foam would dry and harden, releasing formaldehyde gas into the air. Since UFFI is an unstable substance, the gas emissions would continue as the insulation cracked and deteriorated with age. Health problems associated with exposure to formaldehyde include: eye, nose, and throat irritation, coughing, headaches, dizziness, and, in very high concentrations, bronchial pneumonia and pulmonary oedema. The use of UFFI was banned in 1980 by the Federal Hazardous Products Act (RF 1985).

2.9 **Bird and Animal Droppings**

Bird and animal droppings may present a health risk. The most serious health risks arise from disease organisms that grow in the nutrient rich accumulations of bird and animal droppings. Fungal diseases are associated with bird (including bat) and animal droppings. The two most common diseases associated with bird and bat droppings are histoplasmosis and cryptococcosis.

Histoplasmosis is a common lung disease caused by a microscopic fungus which grows on accumulated bat guano and bird droppings. The fungus enters the lungs usually after the guano has been disturbed. The infection usually causes only minor flu-like symptoms and is resolved uneventfully. In a small percentage of cases it can be fatal, especially to young children. Histoplasmosis can be prevented by avoiding areas with high concentrations of guano or wearing a protective mask and clothing.

Cryptococcosis is rare fungal acquired by inhalation of encapsulated yeast *Cryptococcus neoformans*, which may cause a self-limited pulmonary infection or disseminate, especially to the meninges, but sometimes to the skin, bones, viscera, or other sites.

Histoplasmosis is most often associated with bird and bat droppings and cryptococcosis with pigeon droppings. Both diseases are spread when droppings are disturbed. After the disturbance, the fungal spores (for histoplasmosis) or yeast-like vegetative cells (for cryptococcosis) float in the air by the millions. Workers or visitors nearby, may inhale them and become infected. Bird droppings are most dangerous when they are dry and become airborne as a fine dust.

Most people, when infected by either disease organism, show no symptoms or mild flu-like symptoms. But if someone breathes a high concentration of spores or cells, or is particularly susceptible to the disease, the infection can become serious, sometimes even deadly.

2.10 **Mould**

Mould has recently been recognized as an important environmental health hazard that can cause serious health problems in humans. Moulds are microscopic organisms that belong to the phylum mycophyta (fungi). They can exist in either a terrestrial or aquatic environment and they survive both indoors and out.



All moulds require both a source of nutrients and humidity to survive and flourish. Generally, nutrients are not a limiting factor and, when moisture is high, mould will grow on carpets, furniture, dry wall, insulation, ceiling tiles, etc. Sources of moisture that can support growth include leaky roofs, plumbing leaks, sewer back-ups, a build-up of condensation, etc., or just high humidity (e.g. a shower).

In general, it is the very young, the elderly, and immune-compromised individuals who are most at risk. It is also important to note that sensitivity to mould varies dramatically from individual to individual. The mould concentration that causes a severe reaction by one person may be readily tolerated by another.

Mould exposure from homes or workplaces can cause a variety of symptoms ranging from minor allergic reactions to extremely severe, life threatening disease. Documented health effects from mould exposure include headache, fatigue, cough, shortness of breath, congestion, fever, nausea, and eye, ear and throat irritation.

3. SURVEY METHODOLOGY

Mr. Dale White and Mr. Greg Mallette of XCG conducted a survey of the areas of the building's interior affected by the proposed works on March 22, 2010 with Mr. Mallette returning on March 24, 2010. Prior to commencing the on-site inspections, all information provided by PWGSC was reviewed.

All fieldwork was conducted in accordance with XCG's standard field procedures. Details regarding the approach used in conducting the field investigations including sampling procedures and analytical methodologies are outlined in this section.

3.1 Site Inspections

An inspection of the interior of the portions of the buildings to be upgraded was conducted. The survey was a thorough visual inspection of all accessible areas in the buildings to identify the presence of designated or hazardous materials. In general, this inspection included a survey of structures in areas with reasonable accessibility. All inspections were undertaken in a manner to minimize repetition of inspection and sampling of like areas (i.e. painted surfaces). The buildings were occupied at the time of the survey.

3.2 Confirmatory Sampling

A sufficient number of samples were collected to conclusively identify all suspect materials. All samples were collected and handled according to applicable occupational health and safety regulations. The safety of building occupants was ensured at all times.

As required by the TOR, XCG will use discretion to avoid testing duplicates. The four living unit buildings were likely constructed at the same time and are of similar layout and material. XCG reviewed the 2005 DSHM survey report that provided sampling results for buildings WW05, WW06, and WW08 to WW11. In cases where there was an overlap of areas to be investigated for the current work program with areas investigated in 2005, XCG attempted to avoid duplicating the previous work.

3.3 Record Keeping

Prior to on-site inspection and sampling, a unique and logical sample identification system was developed. This sample identification consisted of the following:

- Building number;
- Room number; and
- Type of materials being sampled and sequential sample number.

All sampling locations were recorded on copies of the building plans that were provided by PWGSC. Please refer to the annotated building plans located in Appendix A for room identifications.

3.4 **Asbestos-Containing Materials**

Visual inspections of all accessible areas in the project area of the buildings were made in order to identify the presence of materials suspected of containing asbestos. In general, these inspections included a survey of structures in areas with reasonable accessibility. Since the building is to be renovated and not demolished, destructive methods were not employed to investigate conditions within walls, below floors, and in other inaccessible areas.

The survey included but was not limited to: thermal insulation, floor tiles, mastic, and plaster applications. When materials suspected of containing friable asbestos were found, the risk of exposure to building occupants was assessed. In addition, the accessibility of the material was also noted. Bulk samples of materials suspected of containing asbestos were collected and were later submitted to International Asbestos Testing Laboratory in Mt. Laurel, New Jersey, USA. If laboratory analysis confirmed the presence of asbestos in the materials sampled, recommendations for any remedial actions considered necessary were developed.

3.4.1 **Risk Exposure and Accessibility**

The methodology used to assess the risk of exposure to building occupants was consistent with the PWGSC document entitled Departmental Policy 057- Asbestos Management (1999), as adopted by the Treasury Board. The exposure risk associated with suspected friable asbestos-containing materials was evaluated in the field and was classified into Categories, 1, 2, and 3. A material was classified as Category 1 if there was little or no perceived risk associated with the material in its present condition. The material was classified as Category 2 if minor upgrades or repairs are required to reduce a potential exposure hazard. The material was classified as Category 3 if a significant exposure hazard exists and immediate remedial action is required. Table 3-1 provides a summary of the three exposure risk categories.

Table 3-1 Definitions of Exposure Risk Categories for Friable ACMs, Warkworth Institution, Campbellford, Ontario

Category	Definition
1	Little or no perceived risk associated with material in its present condition.
2	Minor upgrades or repairs are required to reduce a potential exposure hazard.
3	A significant exposure hazard exists, with immediate remedial action required.

The accessibility of building materials suspected of containing friable ACMs was rated in the field according to the following criteria:



Table 3-2 Accessibility of Building Materials for Friable ACMs, Warkworth Institution, Campbellford, Ontario

Access Category	Definition
Access A	Areas of the building within reach (from floor level) of all building users.
Access B	Frequently entered maintenance areas within reach of maintenance staff, without the need of a ladder.
Access C (Exposed)	Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos containing material.
Access C (Concealed)	Areas of the building that require the removal of a building component, including lay-in ceilings and access panels into solid ceiling systems.
Access D	Areas of the building behind inaccessible solid ceiling systems, walls or mechanical equipment etc. where demolition of the ceiling, wall or equipment etc. is required to reach the asbestos containing material.

Risk exposure and accessibility of non-friable material (material that cannot be crumbled into dust using hand pressure) was not assessed in the field as there is little likelihood of exposure of airborne fibres under normal conditions.

3.4.2 Sampling of Suspected Asbestos-Containing Materials

During the survey of the buildings, a sufficient number of bulk samples were collected and submitted for laboratory analysis in order to determine the existence and quantities of all friable and non-friable asbestos containing materials present. All the layers of a material suspected of containing asbestos were sampled.

According to the asbestos regulations (O.Reg. 278/05 (amended to 493/09)), minimum numbers of bulk samples are listed in Table 1, subsection 3(3) for different types of materials to be able to properly identify any asbestos containing building materials. For troweled on surface applications, such as plaster, the minimum number of samples for areas of less than 90 square metres of homogeneous applications is 3.

3.4.2.1 Sampling of Friable Materials

During the sampling of any friable materials suspected of containing asbestos, a respirator was worn and the following sampling procedure was used.

1. The surface of the material to be sampled was first wetted using a spray bottle to apply the water.
2. A sample was obtained by slowly pushing the sampler (knife blade) into the material with a twisting motion, until the entire thickness was penetrated. Wetting was continued through the entire process. The sampler was then extracted.
3. The sample was then ejected into a sealable plastic sample bag and labelled with the following information:

- Building number;
 - Room number; and
 - Type of materials being sampled and sequential sample number.
4. The sampler was thoroughly cleaned after the collection of each sample to avoid potential cross contamination of samples. This cleaning was done by wiping down the blade with water.
 5. The sampler damage was then repaired using duct tape.

3.4.2.2 Sampling of Non-Friable Materials

The following sampling procedure was used during the sampling of any non-friable materials suspected of containing asbestos.

1. A sample was obtained by slowly pushing the sampler (knife blade) into the material with a twisting motion. The sampler was then extracted.
2. The sample was then ejected into a sealable plastic sample bag and labelled. In the case of vinyl tiles, a small portion of broken tile was collected, or a knife was used to score the tile and then break a piece off.
3. The sampler was thoroughly cleaned after the collection of each sample to avoid potential cross contamination of samples by wiping down the blade with water.

3.4.3 Analytical Methodologies

Analysis of bulk samples for determination of asbestos content were performed using the procedures detailed in the U.S Environmental Protection Agency “Methods for the Determination of Asbestos in Bulk Building Materials, U.S EPA Report No./600/R-93/116”, or an equivalent recognized method.

Polarized light microscopy (PLM) methodology was used for the analysis of all bulk asbestos samples collected.

3.4.4 Remedial Actions

If laboratory analysis confirmed the presence of asbestos in the materials sampled, recommendations for remedial actions (if any) based on the exposure risk and accessibility of the friable ACMs were made. The Action Matrix provided in Table 3-2 establishes the recommended asbestos control action for friable ACMs and was used to determine the appropriate remedial actions with respect to ACMs. The matrix considers the exposure risk and accessibility of the ACMs. The actions are described in full following the matrix.



Table 3-3 Action Matrix for Friable ACMs, Warkworth Institution, Campbellford, Ontario

Access	Exposure Risk			Debris
	1	2	3	
A	Action 5/7 ¹	Action 5/6 ²	Action 3	Action 1
B	Action 7	Action 5/6 ³	Action 3	Action 1
C (Exposed)	Action 7	Action 6	Action 4	Action 2
C (Concealed)	Action 7	Action 7	Action 4	Action 2
D	Action 7	Action 7	Action 7	Action 7

Notes:

1. If material in ACCESS A/ Exposure Risk 1 is not removed ACTION 7 is required.
2. If material in ACCESS A/ Exposure Risk 2 is not removed ACTION 6 is required.
3. Remove ACM in ACCESS B/ Exposure Risk 2 if ACM is likely to be disturbed.

3.4.4.1 Action Definitions

Action 1 *Immediate Clean-up of Debris That is Likely to be Disturbed*

Restrict access that is likely to cause a disturbance of the ACM debris and clean up ACM debris immediately. Utilize correct asbestos procedures. This action is required for compliance with regulatory requirements. The surveyor should immediately notify property management of this condition.

Action 2 *Entry into Areas with ACM Debris –Type 2 Precautions*

At all locations where ACM debris can be isolated in lieu of removal or cleaned up, use appropriate means to limit entry to the area. Restrict access to the area to persons utilizing Type-2 asbestos work precautions. The precautions will be required until the ACM debris has been cleaned up and the source of the debris has been stabilized or removed.

Action 3 *ACM Removal Required for Compliance*

Remove ACM for compliance with regulatory requirements. Utilize asbestos procedures appropriate to the scope of the removal work.

Action 4 *Access into Areas Where ACM is present and likely to be disturbed by Access-Type 2 Precautions*

Use Type 2 asbestos precautions when entry of access into an area is likely to disturb the ACM. ACTION 4 must be used until the ACM is removed. (Use ACTION 1 or 2 if debris is present).

Action 5 *Proactive ACM Removal*

Remove ACM in lieu of repair, or at locations where the presence of asbestos with an Exposure Risk of 1 is not desirable.

Action 6 *ACM Repair*

Repair ACM that has an exposure risk of 2, and is not likely to be damaged again or disturbed by normal use of the area or room. Upon completion of the repair work, treat ACM as material with an exposure risk of 1 and implement ACTION 7. If ACM is likely to be damaged or disturbed, during normal use of the area or room, implement ACTION 5.



Action 7 *Routine Surveillance*

Institute routine surveillance of the ACM. Trained workers or contractors must use appropriate asbestos precautions (Type 1, Type 2 or Type 3) during the disturbance of the remaining ACM.

3.5 *Lead-Based Paints*

During the survey, the condition of the various paint applications identified in the buildings was noted. The condition of the paint surface was evaluated using XCG's Classification System outlined below in Section 3.5.1.

Representative paint samples were collected and submitted to International Asbestos Testing Laboratory in Mt. Laurel, New Jersey, USA. Although the Federal Hazardous Products Act – Hazardous Product (Liquid Coating Material) Regulation (1976) limited the quantity of lead permissible in newly manufactured paints to 0.5% (5,000 ppm), the Surface Coating Materials Regulation (2005) limits the lead concentration in paints to 600 mg/kg or 600 ppm. Therefore, paints having a lead content greater than 0.06 % are thus considered to be lead-based.

All painted areas of significant size (and different colours) were discretely sampled and analyzed for lead. Areas where several layers of paint existed did not necessarily have identification of each layer unless the paint was in poor condition. However, every attempt to identify the number and colours of the layers was made.

3.5.1 *XCG Classification System*

XCG's evaluation of the condition of painted surfaces was based on the following definitions.

Good	No peeling of painted surfaces.
Fair	Some minor cracking on painted surfaces. Repainting is possible without surface treatment.
Poor	Significant cracking and/or peeling of painted surfaces. Removal of loose material will be necessary prior to repainting.

3.5.2 *Paint Sampling*

XCG field staff used a scraper blade to collect bulk paint samples. Paint was scraped directly off the substrate and into a plastic-sampling bag, which was then sealed and labelled. Special care was made to ensure that all layers of paint were removed equally but none of the substrate. Following information was included in the label.

- Building number;
- Room number; and
- Type of materials being sampled and sequential sample number.

3.6 Lead-Containing Materials

During the “room-by room” survey of the proposed work areas, attempts were made to identify other lead-containing materials (such as pipes, wiring, etc.). Given the age of the buildings, there is some potential that lead-containing solder and pipe may exist in various areas of the buildings but these materials were not sampled.

3.7 Polychlorinated Biphenyls (PCBs)

During the survey, where possible, a representative number (about 10%) of fluorescent light fixtures if encountered in the proposed areas of renovations were opened and the ballasts were inspected to determine if they contain PCBs.

During the survey, if any PCB wastes and/or storage sites were identified, their presence and location were also recorded.

3.8 Silica

During the survey activities, the presence of any materials suspected of containing silica, the locations of these materials and the quantities were recorded.

Inspections for potential sources of silica were conducted during the XCG inspections at the facility. No samples were taken.

3.9 Ozone-Depleting Substances (ODSs)

During survey activities, the presence of equipment containing refrigerants in the renovation areas was recorded, including information about types and quantities of ODSs.

3.10 Mercury

During the survey, the presence of any materials or equipment containing mercury (or suspected of containing mercury), including thermometers, pressure gauges and electrical equipment were identified and recorded. No such equipment was noted during the survey that would be affected by the proposed renovations.

3.11 UFFI

During survey activities, inspections were made in order to determine the presence of any urea formaldehyde foam insulation (UFFI). The interior walls were inspected for evidence of repaired openings (i.e., “nozzle holes”) made for installation of the insulation. Any UFFI material identified and its location was recorded.

3.12 Bird and Animal Droppings

During survey activities, the presence of bird and animal droppings was recorded.

3.13 Mould

The mould inspection consisted of looking for visible signs of mould in areas where mould growth is likely. Such areas include those with building materials containing cellulose (e.g. paper, cardboard, wood, etc.), where these materials are exposed from time to time to water or high humidity. The presence of mould was recorded.

3.14 Other Designated Substances

Other designated substances that were included in the DSHM survey were: acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride. Evidence of the presence of these materials was included in the inspection.

4. WW05 DSHM SURVEY FINDINGS

4.1 Background

XCG conducted the interior survey of the proposed renovation areas of Building WW05 at the Warkworth Institution in Campbellford on March 22, 2010. As previously mentioned in Section 1.1, contemplated renovation areas included the vertical shafts (pipe chases) between pairs of cell units and the associated mechanical room.

“Room by room” visual inspections of the proposed work area were conducted as part of the survey. In general, the inspections included a survey of structures in areas with reasonable accessibility.

Annotated floor plans for the building have been provided in Appendix A. Please refer to Figure 2 for this subject building,

4.2 Asbestos-Containing Materials

During the DSHM surveys, representative samples of materials suspected to contain asbestos were collected.

A total of six (6) samples of suspected asbestos-containing materials were collected from the building in the proposed renovation area. The samples were submitted to the laboratory and analyzed by polarized light microscopy (PLM) analysis.

According to the asbestos regulations (O.Reg. 278/05 (amended to 493/09)), minimum numbers of bulk samples are listed in Table 1, Subsection 3(3), for different types of materials to be able to properly identify any asbestos containing building materials. For troweled on surface applications, such as plaster, the minimum number of samples for areas of less than 90 square metres of homogeneous applications is three. It should be noted that in the event that a sample was identified as being an asbestos containing material the additional samples of that same material were not analyzed.

In addition, in instances where materials not visually distinguishable from one another were submitted for asbestos analysis and one material was found to be asbestos-containing and one material was not, it was considered prudent to treat the material that was found not to contain asbestos as suspected ACM. A summary of the sampling program for Building WW05 is provided in Table 4-1. The sample identification and sample location have been included in this table. The building plans in Appendix A show the approximate sampling locations. Laboratory certificates of analysis have been included in Appendix B.

Based on the findings of the survey and laboratory analytical results, the pipe elbow insulation (friable) in Room 109 was identified as being asbestos containing (70% Chrysotile). The identification of asbestos in the pipe elbows confirms the historical analytical findings from the 2005 investigation. The assessed friability of these



materials is presented in Table 4-1. No other asbestos containing materials were identified.

The 2005 investigation identified pipe elbow insulation from Room 109 as being asbestos containing (50-75% Chrysotile). This pipe elbow insulation is considered to be the same material as samples WW05-109-ELB19 through to WW05-109-ELB21, collected by XCG during this DSHM survey. The data from 2005 is presented in Table 4-1 below.

The exposure risk and accessibility associated with the confirmed and suspected asbestos-containing materials was evaluated in the field. The methodology used was outlined previously in Section 3.4.1.

Mitigative measures for asbestos-containing materials are discussed in Section 10.1.



Table 4-1 Summary of Asbestos Survey, Building WW05, Warkworth Institution, Campbellford, Ontario

Sample ID	Sample Location	Sample Description and Location	Quantity ¹	Friability ²	Exposure Risk ³	Accessibility ⁴	Asbestos Content ⁵	Comments
<i>Plaster Applications</i>								
WW05-109-ELB19	Room 109	Grey Pipe Elbow Insulation	26 Pieces	Friable	1	B	70% (C)	
WW05-109-ELB20	Room 109	Grey Pipe Elbow Insulation	Incl. in above total	-	-	-	Not Analyzed	(Same as WW05-109-ELB19)
WW05-109-ELB21	Room 109	Grey Pipe Elbow Insulation	Incl. in above total	-	-	-	Not Analyzed	(Same as WW05-109-ELB19)
WW05-109-PE1 (2005)	Room 109	Grey Pipe Elbow Insulation	Incl. in above total	Friable	1	B	50-75% (C)	Data taken from 2005 XCG report (Same as WW05-109-ELB19)
WW05-109-PL22	Room 109	Plaster Jacket Over Duct Work	-	-	-	-	None Detected	
WW05-109-PL23	Room 109	Plaster Jacket Over Duct Work	-	-	-	-	None Detected	(Same as WW05-109-PL22)
WW05-109-PL24	Room 109	Plaster Jacket Over Duct Work	-	-	-	-	None Detected	(Same as WW05-109-PL22)

Notes:

- Quantity is provided for only materials found or suspected to be asbestos-containing.
- Friability is assessed as friable or non-friable.
- Exposure Risk is ranked (for friable, asbestos-containing samples only) as: 1 – little or no risk, 2 – minor repairs required, or 3 – exposure hazard and remedial action required.
- Accessibility is rated (for friable, asbestos-containing samples only) as: A, B, C (exposed), C (concealed) or D (see Section 3.4.1 for description of codes).
- Type of Asbestos is Chrysotile (C), Amosite (A) or Other Fibre (O) with the total percentage of asbestos contained.



4.3 Lead-Based Paints

During the survey, paint samples were not collected from Building WW05 since the 2005 DSHM survey adequately tested surfaces in the proposed renovation areas.

The Federal Hazardous Products Act – Liquid Coating Material (1976) limited the quantity of lead permissible in newly manufactured paints to 0.5% (5,000 ppm). This Act was recently updated with the *Surface Coating Material Regulation* (2005) in which the permissible concentration of lead in paints was reduced to 600 ppm. Therefore paints having a lead content greater than 0.06 % are considered to be lead-based.

All lead concentrations in the samples analyzed in 2005 were found to be below 600 ppm and therefore lead based paint has not been identified in Building WW05. The sample collected in 2005 from the renovation area is presented in Table 4-2 below.

Table 4-2 Summary of Lead Paint, Building WW05, Warkworth Institution, Campbellford, Ontario

Sample ID	Sample Location ³	Paint Colour	Location of Paint	Area ¹ (m ²)	Condition ²	Lead (ppm)	Comments
WW05-109-WP1 (2005)	109	Cream	Wall	-	-	<20	Data taken from 2005 XCG report

Notes:

1. Area is provided only for paint that was found to be lead based.
2. Condition (worst case) is rated as good, fair or poor with regards to peeling and/or flaking and only provided if paint was found to be lead based..
3. Please refer to Figures 1 in Appendix A for room identifications.

4.4 Lead-Containing Materials

Due to the age of the building it is possible that lead-containing solder is present on plumbing in the building. The solder is typically used on copper pipes, and cannot be sampled since it is located inside the joints. No samples of suspected lead-containing solder were collected. All solder on plumbing should be treated as lead-based, and should be managed in accordance with O. Reg. 843 (amended to 490/09) during renovation activities. If the materials are not to be recycled, the materials should be disposed of in accordance with O. Reg. 347 (amended to 337/09).

4.5 Polychlorinated Biphenyls (PCBs)

The only potential sources of PCBs identified during the survey were the fluorescent light ballasts identified in the renovation areas. The 2005 investigation indicated that the majority of fluorescent light fixtures have been replaced prior to the 2005 survey however there is a possibility that some of the light fixtures contain PCB-containing ballasts. XCG was unable to remove the plate covers and inspect the ballasts at the time of the survey. In the event that a fixture is to be removed during the renovation,



the ballast should be inspected to determine if it is PCB-containing and disposed of in accordance with O. Reg. 347 (amended to 337/09) and O. Reg. 362 (amended to 33/07).

4.6 Ozone-Depleting Substances

Ozone depleting substances were not identified in the proposed renovation areas in the building.

4.7 Mercury-Containing Equipment

The only potential sources of mercury identified during the survey of the building were fluorescent light tubes.

4.8 Silica

The only sources of silica observed during the survey included concrete block walls, concrete floor and coarse plaster applications. No free silica was identified.

4.9 UFFI

During survey activities, inspections of the interior walls of the building were made in order to determine the presence of any urea formaldehyde foam insulation (UFFI). No UFFI was identified during the survey.

4.10 Bird and Animal Droppings

No bird or animal droppings were identified in any of the proposed renovation areas of the subject building.

4.11 Mould

No significant mould growth was identified during the survey.

4.12 Other Designated Substances

None of the following designated substances were noted within the buildings during the survey: acrylonitrile, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride.



5. WW06 DSHM SURVEY FINDINGS

5.1 Background

XCG conducted the interior survey of the proposed renovation areas of Building WW06 at the Warkworth Institution in Campbellford on March 22, 2010. As previously mentioned in Section 1.1, contemplated renovation areas included the vertical shafts (pipe chases) between pairs of cell units and the associated mechanical room(s).

“Room by room” visual inspections of the proposed work area were conducted as part of the survey. In general, the inspections included a survey of structures in areas with reasonable accessibility.

Annotated floor plans for the building have been provided in Appendix A. Please refer to Figure 3 for this subject building,

5.2 Asbestos-Containing Materials

During the DSHM surveys, representative samples of materials suspected to contain asbestos were collected.

A total of seventeen (17) samples of suspected asbestos-containing materials were collected from the building in the proposed renovation areas. The samples were submitted to the laboratory and analyzed by polarized light microscopy (PLM). The laboratory was able to separate the layers of some of the submitted samples and in such cases analysis was conducted on both layers (mastic and floor tile).

According to the asbestos regulations (O. Reg. 278/05 (amended to 493/09)), minimum numbers of bulk samples are listed in Table 1, Subsection 3(3), for different types of materials to be able to properly identify any asbestos containing building materials. For troweled on surface applications, such as plaster the minimum number of samples for areas of less than 90 square metres of homogeneous applications is three. It should be noted that in the event that a sample was identified as being an asbestos containing material the additional samples of that same material were not analyzed.

In addition, in instances where materials not visually distinguishable from one another were submitted for asbestos analysis and one material was found to be asbestos-containing and one material was not, it was considered prudent to treat the material that was found not to contain asbestos as suspected ACM. A summary of the sampling program for Building WW06 is provided in Table 5-1. The sample identification and sample location have been included in this table. The building plans in Appendix A show the approximate sampling locations. Laboratory certificates of analysis have been included in Appendix B.

Based on the findings of the survey and laboratory analytical results, the 9” x 9” grey floor tiles (non-friable) in Room 115 were identified as being asbestos containing



(6.3% Chrysotile with a quantity of 6 m²). Pipe elbow insulation in Room 114 was identified as being asbestos containing (70% Chrysotile with a quantity of 8 pieces). The assessed friability of these materials is presented in Table 5-1. No other asbestos containing materials were identified. It should be noted that one (1) plaster elbow in room 114 of building WW06 that was observed to be damaged and should be repaired as soon as possible.

The 2005 investigation identified cream coloured 9" x 9" vinyl floor tile as being asbestos containing (10-20% Chrysotile) in Room 115. This vinyl floor tile is considered to be the same material as samples WW06-115-FT1 through to WW06-115-FT3, collected by XCG during this DSHM survey. In addition pipe elbow insulation from Room 114 was identified as being asbestos containing (25-50% Chrysotile). This pipe elbow insulation is considered to be the same material as samples WW06-114-ELB4 through to WW06-114-ELB6, collected by XCG during this DSHM survey. The data from 2005 is presented in Table 5-1 below.

The exposure risk and accessibility associated with the confirmed and suspected asbestos-containing materials was evaluated in the field. The methodology used was outlined previously in Section 3.4.1.

Mitigative measures for asbestos-containing materials are discussed in Section 10.1.



Table 5-1 Summary of Asbestos Survey, Building WW06, Warkworth Institution, Campbellford, Ontario

Sample ID	Sample Location	Sample Description and Location	Quantity ¹	Friability ²	Exposure Risk ³	Accessibility ⁴	Asbestos Content ⁵	Comments
<i>Plaster Applications</i>								
WW06-114-ELB4	Room 114	Grey Plaster On Pipe Elbow	8 Pieces	Friable	1	B	70% (C)	One elbow was identified in poor condition
WW06-114-ELB5	Room 114	Grey Plaster On Pipe Elbow	Incl. in above total	-	-	-	Not Analyzed	(Same as WW06-114-ELB4)
WW06-114-ELB6	Room 114	Grey Plaster On Pipe Elbow	Incl. in above total	-	-	-	Not Analyzed	(Same as WW06-114-ELB4)
WW06-114-PE1 (2005)	Room 114	Grey Pipe Elbow Insulation	Incl. in above total	Friable	1	B	25-50% (C)	Data taken from 2005 XCG report (Same as WW06-114-ELB4)
WW06-114-PL7	Room 114	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	
WW06-114-PL8	Room 114	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	(Same as WW06-114-PL7)
WW06-114-PL9	Room 114	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	(Same as WW06-114-PL7)
WW06-114-PL10	Room 114	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	(Same as WW06-114-PL7)
WW06-114-PL11	Room 114	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	(Same as WW06-114-PL7)
WW06-115-P13	Room 115	Plaster on Copper Piping Beneath Plaster	-	-	-	-	None Detected	
WW06-115-P14	Room 115	Plaster on Copper Piping Beneath Plaster	-	-	-	-	None Detected	(Same as WW06-114-P13)
WW06-115-P15	Room 115	Plaster on Copper Piping Beneath Plaster	-	-	-	-	None Detected	(Same as WW06-114-P13)



Sample ID	Sample Location	Sample Description and Location	Quantity ¹	Friability ²	Exposure Risk ³	Accessibility ⁴	Asbestos Content ⁵	Comments
Flooring Applications								
WW06-115-FT1	Room 115	9"x9" Grey Floor Tile	6 m ²	Non-Friable	1	A	6.3% (C)	
WW06-115-FT2	Room 115	9"x9" Grey Floor Tile	Incl. in above total	-	-	-	Not Analyzed	(Same as WW06-115-FT1)
WW06-115-FT3	Room 115	9"x9" Grey Floor Tile	Incl. in above total	-	-	-	Not Analyzed	(Same as WW06-115-FT1)
WW06-115-FT1 (2005)	Room 115	9" x 9" Cream Floor Tile	Incl. in above total	Non-Friable	1	A	10-20% (C)	Data taken from 2005 XCG report (Same as WW06-115-FT1)
WW06-115-FT16	Room 115	12"x12" Cream Floor Tile	-	-	-	-	None Detected	
WW06-115-FT17	Room 115	12"x12" Cream Floor Tile	-	-	-	-	None Detected	(Same as WW06-115-FT16)
WW06-115-FT18	Room 115	12"x12" Cream Floor Tile	-	-	-	-	None Detected	(Same as WW06-115-FT16)
Mastic and Caulking								
WW06-115-FT1 (M)	Room 115	Black Mastic Under Floor Tiles Under 9" x 9" Floor Tiles	-	-	-	-	None Detected	Lab removed this sample from the floor tile piece for analysis
WW06-115-FT16 (M)	Room 115	Yellow Mastic Under 12" x 12" Cream Floor Tiles	-	-	-	-	None Detected	Lab removed this sample from the floor tile piece for analysis
WW06-115-FT17 (M)	Room 115	Yellow Mastic Under 12" x 12" Cream Floor Tiles	-	-	-	-	None Detected	(Same as WW06-115-FT16 (M)) Lab removed this sample from the floor tile piece for analysis



Sample ID	Sample Location	Sample Description and Location	Quantity ¹	Friability ²	Exposure Risk ³	Accessibility ⁴	Asbestos Content ⁵	Comments
WW06-115-FT18 (M)	Room 115	Yellow Mastic Under 12" x 12" Cream Floor Tiles	-	-	-	-	None Detected	(Same as WW06-115- FT16 (M)) Lab removed this sample from the floor tile piece for analysis

Notes:

- 1 Quantity is provided for only materials found or suspected to be asbestos-containing.
- 2 Friability is assessed as friable or non-friable.
- 3 Exposure Risk is ranked (for friable, asbestos-containing samples only) as: 1 – little or no risk, 2 – minor repairs required, or 3 – exposure hazard and remedial action required.
- 4 Accessibility is rated (for friable, asbestos-containing samples only) as: A, B, C (exposed), C (concealed) or D (see Section 3.4.1 for description of codes).
- 5 Type of Asbestos is Chrysotile (C), Amosite (A) or Other Fibre (O) with the total percentage of asbestos contained.



5.3 **Lead-Based Paints**

During the survey, one (1) paint sample was collected from Building WW06. The paint samples collected were submitted for analysis of bulk lead. In cases where similar paint applications were identified to those analyzed for lead, the lead content of these applications in some instances was inferred based on analytical results. A summary of the paint survey is provided in Table 5-2. The paint sample (cream colour) was collected from the wall of Room 115.

The Federal Hazardous Products Act – Liquid Coating Material (1976) limited the quantity of lead permissible in newly manufactured paints to 0.5% (5,000 ppm). This Act was recently updated with the *Surface Coating Material Regulation* (2005) in which the permissible concentration of lead in paints was reduced to 600 ppm. Therefore paints having a lead content greater than 0.06 % are considered to be lead-based.

An additional paint sample collected as part of the 2005 DSHM survey identified lead based paint in the proposed renovation area in Building WW06. The 2005 survey identified white wall paint (7,006 ppm) on the upper half of the corridor in Room 101 as being lead based.

The concentration of lead in the paint sample collected by XCG as part of this DSHM survey was below the 600 ppm standard. It should be noted that matrix interference occurred during analysis and the concentration of lead in the sample may be higher than 490 ppm. In the event that the wall and ceiling of Room 115 in building WW06 is to be disturbed than an additional sample of paint should be collected and submitted for laboratory analysis for lead prior to renovation activities.

Table 5-2 provides a summary of the paint survey conducted during the present DSHM survey and the 2005 survey. The sample identification, sample location, paint colour, location of all similar paint applications and lead content have been included in this table. The annotated building plans in Appendix A show the approximate sampling locations. Laboratory certificates of analysis for the samples collected have been included in Appendix B.



Table 5-2 Summary of Lead Paint, Building WW06, Warkworth Institution, Campbellford, Ontario

Sample ID	Sample Location ³	Paint Colour	Location of Paint	Area ¹ (m ²)	Condition ²	Lead (ppm)	Comments
WW06-115-P12	Room 115	Cream	Wall & Ceiling	-	-	490	Conc'n of lead may be >490 ppm due to matrix interference.
WW06-101-WP1 (2005)	Room 101	White	Upper Half of Corridor	95 m ²	Good	7,006	Data taken from 2005 XCG report

Notes:

1. Area is provided only for paint that was found to be lead based.
2. Condition (worst case) is rated as good, fair or poor with regards to peeling and/or flaking and only provided if paint was found to be lead based..
3. Please refer to Figures 1 in Appendix A for room identifications.

5.4 Lead-Containing Materials

Due to the age of the building it is possible that lead-containing solder is present on plumbing in the building. The solder is typically used on copper pipes, and cannot be sampled since it is located inside the joints. No samples of suspected lead-containing solder were collected. All solder on plumbing should be treated as lead-based, and should be managed in accordance with O. Reg. 843 (amended to 490/09) during renovation activities. If the materials are not to be recycled, the materials should be disposed of in accordance with O. Reg. 347 (amended to 337/09).

5.5 Polychlorinated Biphenyls (PCBs)

The only potential sources of PCBs identified during the survey were the fluorescent light ballasts identified in the renovation areas. The 2005 investigation indicated that the majority of fluorescent light fixtures have been replaced prior to the 2005 survey however there is a possibility that some of the light fixtures contain PCB-containing ballasts. XCG was unable to remove the plate covers and inspect the ballasts at the time of the survey. In the event that a fixture is to be removed during the renovation, the ballast should be inspected to determine if it is PCB-containing and disposed of in accordance with O. Reg. 347 (amended to 337/09) and O. Reg. 362 (amended to 33/07).

5.6 Ozone-Depleting Substances

Ozone depleting substances were not identified in the proposed renovation areas in the building.



5.7 Mercury-Containing Equipment

The only potential sources of mercury identified during the survey of the building were fluorescent light tubes.

5.8 Silica

The only sources of silica observed during the survey included concrete block walls, concrete floor and coarse plaster applications. No free silica was identified.

5.9 UFFI

During survey activities, inspections of the interior walls of the building were made in order to determine the presence of any urea formaldehyde foam insulation (UFFI). No UFFI was identified during the survey.

5.10 Bird and Animal Droppings

No bird or animal droppings were identified in any of the proposed renovation areas of the subject building.

5.11 Mould

A minor quantity (<1 m²) of mould was identified in one location on the forced air ductwork during the survey in Room 114.

5.12 Other Designated Substances

None of the following designated substances were noted within the buildings during the survey: acrylonitrile, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride.

6. WW08 DSHM SURVEY FINDINGS

6.1 Background

XCG conducted the interior survey of the proposed renovation areas of Building WW08 at the Warkworth Institution in Campbellford on March 24, 2010. As previously mentioned in Section 1.1, contemplated renovation areas included the vertical shafts (pipe chases) between pairs of cell units and the associated mechanical room(s).

“Room by room” visual inspections of the proposed work area were conducted as part of the survey. In general, the inspections included a survey of structures in areas with reasonable accessibility.

Annotated floor plans for the building have been provided in Appendix A. Please refer to Figures 4, 5 and 6 for this subject building,

6.2 Asbestos-Containing Materials

During the DSHM surveys, representative samples of materials suspected to contain asbestos were collected.

A total of three (3) samples of suspected asbestos-containing materials were collected from the building in the proposed renovation area. The samples were submitted to the laboratory and analyzed by polarized light microscopy (PLM) analysis.

According to the asbestos regulations (O. Reg. 278/05 (amended to 493/09)), minimum numbers of bulk samples are listed in Table 1, Subsection 3(3), for different types of materials to be able to properly identify any asbestos containing building materials. For troweled on surface applications, such as plaster, the minimum number of samples for areas of less than 90 square metres of homogeneous applications is three. It should be noted that in the event that a sample was identified as being an asbestos containing material the additional samples of that same material were not analyzed.

In addition, in instances where materials not visually distinguishable from one another were submitted for asbestos analysis and one material was found to be asbestos-containing and one material was not, it was considered prudent to treat the material that was found not to contain asbestos as suspected ACM. A summary of the sampling program for Building WW08 is provided in Table 6-1. The sample identification and sample location have been included in this table. The building plans in Appendix A show the approximate sampling locations. Laboratory certificates of analysis have been included in Appendix B.

Based on the findings of the survey and laboratory analytical results, the fire damper gasket insulation in ductwork (friable) in the mechanical room (Room B01) was identified as being asbestos containing (10% Chrysotile and 5% Crocidolite). There



is limited access to the buried duct work beneath the cell ranges where the fire damper was identified, as a result it is not possible to determine the quantity of asbestos containing material identified as the fire damper. The assessed friability of these materials is presented in Table 6-1.

Asbestos containing material was not identified in the proposed renovation area during the 2005 investigation.

The exposure risk and accessibility associated with the confirmed and suspected asbestos-containing materials was evaluated in the field. The methodology used was outlined previously in Section 3.4.1.

Mitigative measures for asbestos-containing materials are discussed in Section 10.1.



Table 6-1 Summary of Asbestos Survey, Building WW08, Warkworth Institution, Campbellford, Ontario

Sample ID	Sample Location	Sample Description and Location	Quantity ¹	Friability ²	Exposure Risk ³	Accessibility ⁴	Asbestos Content ⁵	Comments
<i>Plaster Applications</i>								
WW08-FD-39	Room B01	Fire Damper Gasket Inside Ductwork	Incl. in total below	-	-	-	None Detected	Although asbestos was not identified, this sample is assumed to be asbestos containing based on results from sample WW08-FD-40
WW08-FD-40	Room B01	Fire Damper Gasket Inside Ductwork	Unknown	Friable	1	C	10% (C) 5% (Cr)	(Same as WW08-FD-39)
WW08-FD-41	Room B01	Fire Damper Gasket Inside Ductwork	Incl. in above total	-	-	-	Not Analyzed	(Same as WW08-FD-39)

Notes:

- Quantity is provided for only materials found or suspected to be asbestos-containing.
- Friability is assessed as friable or non-friable.
- Exposure Risk is ranked (for friable, asbestos-containing samples only) as: 1 – little or no risk, 2 – minor repairs required, or 3 – exposure hazard and remedial action required.
- Accessibility is rated (for friable, asbestos-containing samples only) as: A, B, C (exposed), C (concealed) or D (see Section 3.4.1 for description of codes).
- Type of Asbestos is Chrysotile (C), Amosite (A), Crocidolite (Cr) or Other Fibre (O) with the total percentage of asbestos contained.



6.3 Lead-Based Paints

During the survey, paint samples were not collected from Building WW08 since the 2005 DSHM survey adequately tested surfaces in the proposed renovation areas.

The Federal Hazardous Products Act – Liquid Coating Material (1976) limited the quantity of lead permissible in newly manufactured paints to 0.5% (5,000 ppm). This Act was recently updated with the *Surface Coating Material Regulation* (2005) in which the permissible concentration of lead in paints was reduced to 600 ppm. Therefore paints having a lead content greater than 0.06 % are considered to be lead-based.

All lead concentrations in the samples analyzed in 2005 in the proposed renovation area were found to be below 600 ppm. The sample collected in 2005 from the renovation area is presented in Table 6-2 below.

Table 6-2 Summary of Lead Paint, Building WW08, Warkworth Institution, Campbellford, Ontario

Sample ID	Sample Location ³	Paint Colour	Location of Paint	Area ¹ (m ²)	Condition ²	Lead (ppm)	Comments
WW08-B01-WP1 (2005)	Room B01	Cream	Wall	-	-	37.9	Data taken from 2005 XCG report

Notes:

1. Area is provided only for paint that was found to be lead based.
2. Condition (worst case) is rated as good, fair or poor with regards to peeling and/or flaking and only provided if paint was found to be lead based..
3. Please refer to Figures 1 in Appendix A for room identifications.

6.4 Lead-Containing Materials

Due to the age of the building it is possible that lead-containing solder is present on plumbing in the building. The solder is typically used on copper pipes, and cannot be sampled since it is located inside the joints. No samples of suspected lead-containing solder were collected. All solder on plumbing should be treated as lead-based, and should be managed in accordance with O. Reg. 843 (amended to 490/09) during renovation activities. If the materials are not to be recycled, the materials should be disposed of in accordance with O. Reg. 347 (amended to 337/09).

6.5 Polychlorinated Biphenyls (PCBs)

The only potential sources of PCBs identified during the survey were the fluorescent light ballasts identified in the renovation areas. The 2005 investigation indicated that the majority of fluorescent light fixtures have been replaced prior to the 2005 survey however there is a possibility that some of the light fixtures contain PCB-containing ballasts. XCG was unable to remove the plate covers and inspect the ballasts at the time of the survey. In the event that a fixture is to be removed during the renovation, the ballast should be inspected to determine if it is PCB-containing, and disposed of



in accordance with O. Reg. 347 (amended to 337/09) and O. Reg. 362 (amended to 33/07).

6.6 Ozone-Depleting Substances

Ozone depleting substances were not identified in the proposed renovation areas in the building.

6.7 Mercury-Containing Equipment

The only potential sources of mercury identified during the survey of the building were fluorescent light tubes.

6.8 Silica

The only sources of silica observed during the survey included concrete block walls, concrete floor and coarse plaster applications. No free silica was identified.

6.9 UFFI

During survey activities, inspections of the interior walls of the building were made in order to determine the presence of any urea formaldehyde foam insulation (UFFI). No UFFI was identified during the survey.

6.10 Bird and Animal Droppings

No bird or animal droppings were identified in any of the proposed renovation areas of the subject building.

6.11 Mould

No mould was identified during the survey.

6.12 Other Designated Substances

None of the following designated substances were noted within the buildings during the survey: acrylonitrile, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride.



7. WW09 DSHM SURVEY FINDINGS

7.1 Background

XCG conducted the interior survey of the proposed renovation areas of Building WW09 at the Warkworth Institution in Campbellford on March 22, 2010. As previously mentioned in Section 1.1, contemplated renovation areas included the vertical shafts (pipe chases) between pairs of cell units and the associated mechanical room(s).

“Room by room” visual inspections of the proposed work area were conducted as part of the survey. In general, the inspections included a survey of structures in areas with reasonable accessibility.

Annotated floor plans for the building have been provided in Appendix A. Please refer to Figures 7, 8 and 9 for this subject building.

7.2 Asbestos-Containing Materials

During the DSHM surveys, representative samples of materials suspected to contain asbestos were collected.

A total of eleven (11) samples of suspected asbestos-containing materials including one (1) QA/QC samples were collected from the building in the proposed renovation area. The samples were submitted to the laboratory and analyzed by polarized light microscopy (PLM) analysis.

According to the asbestos regulations (O. Reg. 278/05 (amended to 493/09)), minimum numbers of bulk samples are listed in Table 1, Subsection 3(3), for different types of materials to be able to properly identify any asbestos containing building materials. For troweled on surface applications, such as plaster the minimum number of samples for areas of less than 90 square metres of homogeneous applications is three. It should be noted that in the event that a sample was identified as being an asbestos containing material the additional samples of that same material were not analyzed.

In addition, in instances where materials not visually distinguishable from one another were submitted for asbestos analysis and one material was found to be asbestos-containing and one material was not, it was considered prudent to treat the material that was found not to contain asbestos as suspected ACM. A summary of the sampling program for Building WW09 is provided in Table 7-1. The sample identification and sample location have been included in this table. The building plans in Appendix A show the approximate sampling locations. Laboratory certificates of analysis have been included in Appendix B.

Based on the findings of the survey and laboratory analytical results, the fire damper gasket insulation in ductwork (friable) in the mechanical room (Room B01) was identified as being asbestos containing (10% Chrysotile and 5% Crocidolite). There



is limited access to the buried duct work beneath the cell ranges where the fire damper was identified as a result it is not possible to determine the quantity of asbestos containing material identified as the fire damper. The assessed friability of these materials is presented in Table 7-1.

The 2005 investigation identified pipe elbow insulation from Room 102 as being asbestos containing (>75% Chrysotile). This pipe elbow insulation was identified as being in fair condition with an estimated quantity of 5-10 elbows. The data from 2005 is presented in Table 7-1 below.

The exposure risk and accessibility associated with the confirmed and suspected asbestos-containing materials was evaluated in the field. The methodology used was outlined previously in Section 3.4.1.

Mitigative measures for asbestos-containing materials are discussed in Section 10.1.



Table 7-1 Summary of Asbestos Survey, Building WW09, Warkworth Institution, Campbellford, Ontario

Sample ID	Sample Location	Sample Description and Location	Quantity ¹	Friability ²	Exposure Risk ³	Accessibility ⁴	Asbestos Content ⁵	Comments
<i>Plaster Applications</i>								
WW09-B01-PL25	Room B01	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	
WW09-B01-PL26	Room B01	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	(Same as WW09-B01-PL25)
WW09-B01-PL27	Room B01	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	(Same as WW09-B01-PL25)
WW09-B01-PL28	Room B01	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	(Same as WW09-B01-PL25)
WW09-B01-PL29	Room B01	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	(Same as WW09-B01-PL25)
WW09-B01-PW30	Room B01	Pipe Wrap on Rain Gutter in Pipe Chase	-	-	-	-	None Detected	
WW09-B01-PW31	Room B01	Pipe Wrap on Rain Gutter in Pipe Chase	-	-	-	-	None Detected	
WW09-B01-PW32	Room B01	Pipe Wrap on Rain Gutter in Pipe Chase	-	-	-	-	None Detected	
WW09-B01-FD33	Room B01	Fire Damper Gasket Inside Ductwork	Unknown	Friable	1	C	10% (C) 5% (Cr)	
WW09-B01-FD34	Room B01	Fire Damper Gasket Inside Ductwork	Incl. in above total	-	-	-	Not Analyzed	(Same as WW08-B01-FD33)



Sample ID	Sample Location	Sample Description and Location	Quantity ¹	Friability ²	Exposure Risk ³	Accessibility ⁴	Asbestos Content ⁵	Comments
WW09-B01-FD35	Room B01	Fire Damper Gasket Inside Ductwork	Incl. in above total	-	-	-	Not Analyzed	(Same as WW08-B01- FD33)
WW09-102-PE1 (2005)	Room 102	Pipe Elbow Insulation	5-10 elbows	Friable	2	C	>75% (C)	Data taken from 2005 XCG report

Notes:

- 1 Quantity is provided for only materials found or suspected to be asbestos-containing.
- 2 Friability is assessed as friable or non-friable.
- 3 Exposure Risk is ranked (for friable, asbestos-containing samples only) as: 1 – little or no risk, 2 – minor repairs required, or 3 – exposure hazard and remedial action required.
- 4 Accessibility is rated (for friable, asbestos-containing samples only) as: A, B, C (exposed), C (concealed) or D (see Section 3.4.1 for description of codes).
- 5 Type of Asbestos is Chrysotile (C), Crocidolite (Cr), Amosite (A) or Other Fibre (O) with the total percentage of asbestos contained.



7.3 Lead-Based Paints

During the survey, paint samples were not collected from Building WW09 since the 2005 DSHM survey adequately tested surfaces from other areas in institution with similar paint to the proposed renovation areas.

The Federal Hazardous Products Act – Liquid Coating Material (1976) limited the quantity of lead permissible in newly manufactured paints to 0.5% (5,000 ppm). This Act was recently updated with the *Surface Coating Material Regulation* (2005) in which the permissible concentration of lead in paints was reduced to 600 ppm. Therefore paints having a lead content greater than 0.06 % are considered to be lead-based.

Lead paint was not identified as being present in the proposed renovation areas.

7.4 Lead-Containing Materials

Due to the age of the building it is possible that lead-containing solder is present on plumbing in the building. The solder is typically used on copper pipes, and cannot be sampled since it is located inside the joints. No samples of suspected lead-containing solder were collected. All solder on plumbing should be treated as lead-based, and should be managed in accordance with O. Reg. 843 (amended to 490/09) during renovation activities. If the materials are not to be recycled, the materials should be disposed of in accordance with O. Reg. 347 (amended to 337/09).

7.5 Polychlorinated Biphenyls (PCBs)

The only potential sources of PCBs identified during the survey were the fluorescent light ballasts identified in the renovation areas. The 2005 investigation indicated that the majority of fluorescent light fixtures have been replaced prior to the 2005 survey however there is a possibility that some of the light fixtures contain PCB-containing ballasts. XCG was unable to remove the plate covers and inspect the ballasts at the time of the survey. In the event that a fixture is to be removed during the renovation, the ballast should be inspected to determine if it is PCB-containing, and disposed of in accordance with O. Reg. 347 (amended to 337/09) and O. Reg. 362 (amended to 33/07).

7.6 Ozone-Depleting Substances

Ozone depleting substances were not identified in the proposed renovation areas in the building.

7.7 Mercury-Containing Equipment

The only potential sources of mercury identified during the survey of the building were fluorescent light tubes.



7.8 Silica

The only sources of silica observed during the survey included concrete block walls, concrete floor and coarse plaster applications. No free silica was identified.

7.9 UFFI

During survey activities, inspections of the interior walls of the building were made in order to determine the presence of any urea formaldehyde foam insulation (UFFI). No UFFI was identified during the survey.

7.10 Bird and Animal Droppings

No bird or animal droppings were identified in any of the proposed renovation areas of the subject building.

7.11 Mould

No mould was identified during the survey.

7.12 Other Designated Substances

None of the following designated substances were noted within the buildings during the survey: acrylonitrile, benzene, coke oven emissions, ethylene oxide, isocyanates and vinyl chloride.

8. WW10 DSHM SURVEY FINDINGS

8.1 Background

XCG conducted the interior survey of the proposed renovation areas of Building WW10 at the Warkworth Institution in Campbellford on March 22, 2010. As previously mentioned in Section 1.1, contemplated renovation areas included the vertical shafts (pipe chases) between pairs of cell units and the associated mechanical room(s).

“Room by room” visual inspections of the proposed work area were conducted as part of the survey. In general, the inspections included a survey of structures in areas with reasonable accessibility.

Annotated floor plans for the building have been provided in Appendix A. Please refer to Figures 10, 11 and 12 for this subject building.

8.2 Asbestos-Containing Materials

Samples of suspected asbestos-containing materials were not collected from WW10 since the 2005 DSHM survey adequately tested surfaces in the proposed renovation areas of the building.

The 2005 investigation identified pipe elbow insulation from Room 102 as being asbestos containing (50-75% Chrysotile with a quantity of 1 elbow). The data from 2005 is presented in Table 8-1 below. The exposure risk and accessibility associated with the confirmed asbestos-containing materials was evaluated in the field. The methodology used was outlined previously in Section 3.4.1.

During the DSHM survey fire damper gasket insulation in ductwork (friable) was identified in the mechanical room (Room B01) in WW10. Although samples were not collected, the material is considered the same as sample WW09-B01-FD33 collected from WW09 which was identified as being asbestos containing (10% Chrysotile and 5% Crocidolite). Therefore the all fire damper gasket insulation in ductwork in WW10 should be considered asbestos containing. There is limited access to the buried duct work beneath the cell ranges where the fire damper was identified as a result it is not possible to determine the quantity of asbestos containing material identified as the fire damper

Mitigative measures for asbestos-containing materials are discussed in Section 10.1.



Table 8-1 Summary of Asbestos Survey, Building WW10, Warkworth Institution, Campbellford, Ontario

Sample ID	Sample Location	Sample Description and Location	Quantity ¹	Friability ²	Exposure Risk ³	Accessibility ⁴	Asbestos Content ⁵	Comments
<i>Plaster Applications</i>								
WW10-102-PE1 (2005)	Room 102	Pipe Elbow Insulation	1 elbow	Friable	1	A	50-75% (C)	Data taken from 2005 XCG report

Notes:

- 1 Quantity is provided for only materials found or suspected to be asbestos-containing.
- 2 Friability is assessed as friable or non-friable.
- 3 Exposure Risk is ranked (for friable, asbestos-containing samples only) as: 1 – little or no risk, 2 – minor repairs required, or 3 – exposure hazard and remedial action required.
- 4 Accessibility is rated (for friable, asbestos-containing samples only) as: A, B, C (exposed), C (concealed) or D (see Section 3.4.1 for description of codes).
- 5 Type of Asbestos is Chrysotile (C), Amosite (A) or Other Fibre (O) with the total percentage of asbestos contained.



8.3 Lead-Based Paints

During the survey, paint samples were not collected from Building WW10 since the 2005 DSHM survey adequately tested surfaces in the proposed renovation areas. A summary of the paint survey findings from the 2005 report is provided in Table 8-2.

The Federal Hazardous Products Act – Liquid Coating Material (1976) limited the quantity of lead permissible in newly manufactured paints to 0.5% (5,000 ppm). This Act was recently updated with the *Surface Coating Material Regulation (2005)* in which the permissible concentration of lead in paints was reduced to 600 ppm. Therefore paints having a lead content greater than 0.06 % are considered to be lead-based.

All lead concentrations in the analyzed samples were found to be below 600 ppm.

Table 8-2 provides a summary of the paint survey conducted during the 2005 DSHM survey. The sample identification, sample location, paint colour, location of all similar paint applications and lead content have been included in this table. The annotated building plans in Appendix A show the approximate sampling locations. Laboratory certificates of analysis for the samples collected have been included in Appendix B

Table 8-2 Summary of Lead Paint, Building WW10, Warkworth Institution, Campbellford, Ontario

Sample ID	Sample Location ³	Paint Colour	Location of Paint	Area ¹ (m ²)	Condition ²	Lead (ppm)	Comments
WW10-B01-WP1 (2005)	Room B01	Cream	Wall	-	-	26.3	Data taken from 2005 XCG report

Notes:

- 1 Area is provided only for paint that was found to be lead based.
- 2 Condition (worst case) is rated as good, fair or poor with regards to peeling and/or flaking and only provided if paint was found to be lead based..
- 3 Please refer to Figures 1 in Appendix A for room identifications.

8.4 Lead-Containing Materials

Due to the age of the building it is possible that lead-containing solder is present on plumbing in the building. The solder is typically used on copper pipes, and cannot be sampled since it is located inside the joints. No samples of suspected lead-containing solder were collected. All solder on plumbing should be treated as lead-based, and should be managed in accordance with O. Reg. 843 (amended to 490/09) during renovation activities. If the materials are not to be recycled, the materials should be disposed of in accordance with O. Reg. 347 (amended to 337/09).

8.5 Polychlorinated Biphenyls (PCBs)

The only potential sources of PCBs identified during the survey were the fluorescent light ballasts identified in the renovation areas. The 2005 investigation indicated that



the majority of fluorescent light fixtures have been replaced prior to the 2005 survey however there is a possibility that some of the light fixtures contain PCB-containing ballasts. XCG was unable to remove the plate covers and inspect the ballasts at the time of the survey. In the event that a fixture is to be removed during the renovation, the ballast should be inspected to determine if it is PCB-containing, and disposed of in accordance with O. Reg. 347 (amended to 337/09) and O. Reg. 362 (amended to 33/07).

8.6 Ozone-Depleting Substances

Ozone depleting substances were not identified in the proposed renovation areas in the building.

8.7 Mercury-Containing Equipment

The only potential sources of mercury identified during the survey of the building were fluorescent light tubes.

8.8 Silica

The only sources of silica observed during the survey included concrete block walls, concrete floor and coarse plaster applications. No free silica was identified.

8.9 UFFI

During survey activities, inspections of the interior walls of the building were made in order to determine the presence of any urea formaldehyde foam insulation (UFFI). No UFFI was identified during the survey.

8.10 Bird and Animal Droppings

No bird or animal droppings were identified in any of the proposed renovation areas of the subject building.

8.11 Mould

No mould was identified during the survey.

8.12 Other Designated Substances

None of the following designated substances were noted within the buildings during the survey: acrylonitrile, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride.

9. WW11 DSHM SURVEY FINDINGS

9.1 Background

XCG conducted the interior survey of the proposed renovation areas of Building WW11 at the Warkworth Institution in Campbellford on March 24, 2010. As previously mentioned in Section 1.1, contemplated renovation areas included the vertical shafts (pipe chases) between pairs of cell units and the associated mechanical room(s).

“Room by room” visual inspections of the proposed work area were conducted as part of the survey. In general, the inspections included a survey of structures in areas with reasonable accessibility.

Annotated floor plans for the building have been provided in Appendix A. Please refer to Figures 13, 14 and 15 for this subject building,

9.2 Asbestos-Containing Materials

During the DSHM surveys, representative samples of materials suspected to contain asbestos were collected.

A total of three (3) samples of suspected asbestos-containing materials were collected from the building in the proposed renovation area. The samples were submitted to the laboratory and analyzed by polarized light microscopy (PLM).

According to the asbestos regulations (O. Reg. 278/05 (amended to 493/09)), minimum numbers of bulk samples are listed in Table 1, Subsection 3(3), for different types of materials to be able to properly identify any asbestos containing building materials. For troweled on surface applications, such as plaster, the minimum number of samples for areas of less than 90 square metres of homogeneous applications is three. It should be noted that in the event that a sample was identified as being an asbestos containing material the additional samples of that same material were not analyzed.

In addition, in instances where materials not visually distinguishable from one another were submitted for asbestos analysis and one material was found to be asbestos-containing and one material was not, it was considered prudent to treat the material that was found not to contain asbestos as suspected ACM. A summary of the sampling program for Building WW11 is provided in Table 9-1. The sample identification and sample location have been included in this table. The building plans in Appendix A show the approximate sampling locations. Laboratory certificates of analysis have been included in Appendix B.

Based on the findings of the survey and laboratory analytical results, asbestos containing materials are located in the B01 mechanical room fire dampers in the duct work in building WW11 as identified in building WW08.

Mitigative measures for asbestos-containing materials are discussed in Section 10.1.



Table 9-1 Summary of Asbestos Survey, Building WW11, Warkworth Institution, Campbellford, Ontario

Sample ID	Sample Location	Sample Description and Location	Quantity ¹	Friability ²	Exposure Risk ³	Accessibility ⁴	Asbestos Content ⁵	Comments
<i>Plaster Applications</i>								
WW11-PL-36	Room B01	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	
WW11-PL-37	Room B01	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	(Same as WW11-PL-36)
WW11-PL-38	Room B01	Plaster Jacketing on Ductwork	-	-	-	-	None Detected	(Same as WW11-PL-36)

Notes:

- 1 Quantity is provided for only materials found or suspected to be asbestos-containing.
- 2 Friability is assessed as friable or non-friable.
- 3 Exposure Risk is ranked (for friable, asbestos-containing samples only) as: 1 – little or no risk, 2 – minor repairs required, or 3 – exposure hazard and remedial action required.
- 4 Accessibility is rated (for friable, asbestos-containing samples only) as: A, B, C (exposed), C (concealed) or D (see Section 3.4.1 for description of codes).
- 5 Type of Asbestos is Chrysotile (C), Amosite (A) or Other Fibre (O) with the total percentage of asbestos contained.



9.3 Lead-Based Paints

During the survey, paint samples were not collected from Building WW11 since the 2005 DSHM survey adequately tested surfaces in the proposed renovation areas. A summary of the paint survey findings from the 2005 report is provided in Table 9-2.

The Federal Hazardous Products Act – Liquid Coating Material (1976) limited the quantity of lead permissible in newly manufactured paints to 0.5% (5,000 ppm). This Act was recently updated with the *Surface Coating Material Regulation (2005)* in which the permissible concentration of lead in paints was reduced to 600 ppm. Therefore paints having a lead content greater than 0.06 % are considered to be lead-based.

All lead concentrations in the analyzed samples were found to be below 600 ppm.

Table 9-2 provides a summary of the paint survey conducted during the 2005 DSHM survey. The sample identification, sample location, paint colour, location of all similar paint applications and lead content have been included in this table. The annotated building plans in Appendix A show the approximate sampling locations. Laboratory certificates of analysis for the samples collected have been included in Appendix B.

Table 9-2 Summary of Lead Paint, Building WW11, Warkworth Institution, Campbellford, Ontario

Sample ID	Sample Location ³	Paint Colour	Location of Paint	Area ¹ (m ²)	Condition ²	Lead (ppm)	Comments
WW11-B01-WP1 (2005)	Room B01	Cream	Wall	-	-	<20	

Notes:

- 1 Area is provided only for paint that was found to be lead based.
- 2 Condition (worst case) is rated as good, fair or poor with regards to peeling and/or flaking and only provided if paint was found to be lead based..
- 3 Please refer to Figures 1 in Appendix A for room identifications.

9.4 Lead-Containing Materials

Due to the age of the building it is possible that lead-containing solder is present on plumbing in the building. The solder is typically used on copper pipes, and cannot be sampled since it is located inside the joints. No samples of suspected lead-containing solder were collected. All solder on plumbing should be treated as lead-based, and should be managed in accordance with O. Reg. 843 (amended to 490/09) during renovation activities. If the materials are not to be recycled, the materials should be disposed of in accordance with O. Reg. 347 (amended to 337/09).

9.5 Polychlorinated Biphenyls (PCBs)

The only potential sources of PCBs identified during the survey were the fluorescent light ballasts identified in the renovation areas. The 2005 investigation indicated that



the majority of fluorescent light fixtures have been replaced prior to the 2005 survey however there is a possibility that some of the light fixtures contain PCB-containing ballasts. XCG was unable to remove the plate covers and inspect the ballasts at the time of the survey. In the event that a fixture is to be removed during the renovation, the ballast should be inspected to determine if it is PCB-containing, and disposed of in accordance with O.Reg. 347 (amended to 337/09) and O.Reg. 362 (amended to 33/07).

9.6 Ozone-Depleting Substances

Ozone depleting substances were not identified in the proposed renovation areas in the building.

9.7 Mercury-Containing Equipment

The only potential sources of mercury identified during the survey of the building were fluorescent light tubes.

9.8 Silica

The only sources of silica observed during the survey included concrete block walls, concrete floor and coarse plaster applications. No free silica was identified.

9.9 UFFI

During survey activities, inspections of the interior walls of the building were made in order to determine the presence of any urea formaldehyde foam insulation (UFFI). No UFFI was identified during the survey.

9.10 Bird and Animal Droppings

No bird or animal droppings were identified in any of the proposed renovation areas of the subject building.

9.11 Mould

No mould was identified during the survey.

9.12 Other Designated Substances

None of the following designated substances were noted within the buildings during the survey: acrylonitrile, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride.



10. RECOMMENDATIONS

The following designated substances and hazardous materials were identified during the DSHM survey of Buildings WW05, WW06, WW08, WW09, WW10 and WW11 at Warkworth Institution conducted by XCG: asbestos, lead-based paint, mercury, silica, and mould. No potential sources of UFFI or other designated substances or hazardous materials were identified.

Recommended remedial options for each of the designated substances and/or hazardous materials identified in during the survey are presented below:

10.1 Asbestos-Containing Materials

The following confirmed and suspected asbestos-containing materials were identified during the DSHM survey: pipe elbow insulation, 9" x 9" grey floor tiles, and fire damper gaskets inside buried spiral ductwork. All of the asbestos-containing materials that were identified as part of the DSHM Survey should be managed in accordance with Ontario Regulations 837 (amended to O. Reg. 490/09) and O. Reg. 493/09. Based on the analytical and visual observations made during the survey, all plaster pipe elbows and fire damper gaskets in the buried spiral ductwork should be assumed to be asbestos containing.

Recommendations for remedial actions with respect to the asbestos-containing materials identified in the building were based on the exposure and accessibility of the friable ACMs and on XCG's understanding of the contemplated renovation works.

Based on the confirmation of asbestos in the 9" x 9" grey floor tiles in WW06, if the floor tiles will be disturbed as part of the renovations, it is XCG's recommendation that they be removed using under Type 1 conditions outlined in O. Reg. 278/05 (amended to 493/09). Type 1 operations are required if *"Installing or removing non-friable asbestos-containing material, other than ceiling tiles, if the material is installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated."* (Section 12.(2)2).

Based on the confirmation of asbestos in the plaster pipe elbows and fire damper gaskets in the buried spiral ductwork, XCG recommends that all plaster elbows and plaster fire damper gaskets identified in the buried ductwork in the surveyed buildings be considered asbestos-containing. If these identified materials are to be disturbed as part of the renovation activities, they should be removed under Type 2 or Type 3 conditions as outlined in O. Reg. 278/05 (amended to 493/09).

As stated in O. Reg. 278/05 (amended to 493/09), the act of *"Removing insulation that is asbestos-containing material from a pipe, duct or similar structure using a glove bag."* (Section 12.(3)9) is required to be completed under Type 2 conditions.

As stated in O. Reg. 278/05 (amended to 493/09), *"The following are Type 3 operations: 1. The removal or disturbance of more than one square metre of friable asbestos-containing material during the repair, alteration, maintenance or*



demolition of all or part of a building, aircraft, ship, locomotive, railway car or vehicle or any machinery or equipment.” (Section 12.(4)1)

It should be noted that no immediate safety hazards were identified with respect to the asbestos containing materials identified, with the exception of one (1) plaster elbow in room 114 of building WW06 that was observed to be damaged. All asbestos abatement should be conducted by contractors licensed and insured for this type of abatement work. Disposal of the ACM waste should be in accordance with O. Reg. 347 (amended to 337/09) and conducted by a licensed contractor at a facility that accepts such waste.

10.2 **Lead-Based Paints**

It is worth noting that the majority of proposed renovation areas were observed to be unpainted. However, lead-based paints were identified as being present in the proposed renovation area in building WW06. The lead-based paint in building WW06 was identified as being white paint (7,006 ppm of lead) present in Room 101 on the upper half of the corridor as noted in the 2005 DSHM survey. In addition, cream paint from Room 115 in WW06 was identified as having a lead concentration of 490 ppm. It should be noted that matrix interference occurred during analysis and the concentration of lead in the sample may be greater than 490 ppm. In the event that the wall and ceiling of Room 115 in building WW06 is to be disturbed than an additional sample of paint should be collected and submitted for laboratory analysis for lead prior to renovation activities. All other renovation areas did not have any identified lead-based paint.

All lead-based paint should be managed in accordance with Regulation 843 (amended to O. Reg. 109/04) during all renovation activities. Workers are not at risk of being exposed to lead unless they are undertaking an activity that disturbs surfaces covered with lead-based paint. According to the Ontario Ministry of Labour “*Guideline - Lead on Construction Projects*”, dated September 2004, construction operations regarding lead have been classified in a similar manner to those projects regarding asbestos. This document is a guideline for best practices.

According to this document, “*manual demolition of lead-painted plaster walls or building components by striking a wall with a sledge hammer or similar tool*” is classified as a Type 2a operation, requiring workers to wear protective clothing and an appropriate respirator. Removal of lead-containing coatings or materials by scraping or sanding with a non-powered hand tools also should be undertaken using Type 2a operations. In the event that the painted surface is not to be disturbed no action is required since the paint was identified as being in good condition at the time of the survey.

10.3 **Lead-Containing Materials**

It is possible that lead-containing solder is present in areas of the proposed renovations. All solder on plumbing should be treated as lead-based, and should be managed in accordance with O. Reg 843 (amended to 490/09) during renovation



activities. If the materials are not to be recycled, the materials should be disposed of in accordance with Regulation 347.

10.4 PCBs

The only potential sources of PCBs identified during the survey were the fluorescent light ballasts identified in the renovation areas. The 2005 investigation indicated that the majority of fluorescent light fixtures have been replaced prior to the 2005 survey however there is a possibility that some of the light fixtures contain PCB-containing ballasts. XCG was unable to remove the plate covers and inspect the ballasts at the time of the survey. In the event that a fixture is to be removed during the renovation, the ballast should be inspected to determine if it is PCB-containing.

10.5 ODSs

Ozone depleting substances were not identified in the proposed renovation areas in any of the buildings.

It should be noted that disposal of any refrigeration equipment and/or refrigerant containers is regulated under Ontario Regulation 189/94 (amended to O.Reg. 180/07). In accordance with Reg. 189/94, any removal and/or disposal of refrigeration equipment during demolition activities should only be undertaken by individuals who hold ozone depletion prevention cards.

10.6 Mercury-Containing Equipment

The only potential sources of mercury identified during the survey were fluorescent light tubes and thermostats.

There is no occupational or environmental concern associated with mercury in its current state and condition. Exposure to mercury is regulated under Ontario Regulation 844/90 (amended to O. Reg. 490/09). Where possible fluorescent light tubes should be recycled at an approved recycling facility.

When taken out of service, mercury-containing fluorescent light tubes should be handled in accordance with Ontario Regulation 844/90 (amended O. Reg. 490/09) and if the equipment is not to be recycled it should be disposed of in accordance with Ontario Regulation 347/90.

10.7 Silica

Sources of silica observed during the survey included concrete and cinder blocks. No free silica was identified. Exposure to airborne silica is regulated under Ontario Regulation 845/90 (amended to O. Reg. 490/09) regarding silica under the Occupational Health and Safety Act. Airborne silica can be generated through such processes as blasting, grinding, crushing, and sandblasting silica-containing material. Precautions must be taken to prevent silica-containing particles from becoming airborne during the application of such processes. Such precautions include wetting of silica-containing area(s) to be disturbed and daily wet sweeping or HEPA



vacuuming of silica dust. Additionally, appropriate respiratory protection and ventilation must be utilized during disturbance of silica-containing structures.

10.8 UFFI

UFFI was not identified during the survey and therefore there are no recommendations for mitigative measures.

10.9 Mould

A minor quantity (1 m²) of mould was identified in one location during the survey in Room 114 in Building WW06. Mould was not identified in any of the other proposed renovation areas during the survey.

The suspected mould should be analyzed to determine if it is in fact mould as a precaution. Although there are no Ontario Regulations specifically addressing moulds, during renovation activities, operating procedures should be in place to protect the health and safety of the workers that may be exposed to fungal contamination. Precautions must be taken to prevent fungi from becoming airborne. Such precautions include wetting of fungal area(s) that are to be disturbed. Additionally, appropriate respiratory protection and ventilation must be utilized during disturbance of fungal contamination.

Renovation activities should be consistent with the requirements of the Occupational Health and Safety Act of Ontario and the guidelines issued by the Ontario Ministry of Labour for workers who may be exposed to mould issued in a “*Hazard Alert*” fact sheet in December 2000 entitled, “*Mould in Workplace Buildings*.” Standard Construction Document CCA 82 2004, “*Mould Guidelines for the Canadian Construction Industry*” as well as Environmental Abatement Council of Ontario (EACO) 2004 publication “*Mould Abatement Guidelines*”, should also be reviewed and the best management practices followed with respect to mould abatement.

10.10 Other Designated Substances

None of the following designated substances were noted within the buildings: acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates and vinyl chloride. Therefore, no mitigative measures relating to these substances are required.

11. REFERENCES

Hazardous Products Act, R.S., c. H-3, s. 1., 1976, Surface Coating Materials SOR/2005-109, 2005.

Environmental Protection Act, R.S.O. 1990, Ontario Regulation 189/94, Amended to O. Reg. 180/07, Refrigerants.

Environmental Protection Act, R.R.O. 1990, Regulation 347, Amended to O. Reg. 337/09, General – Waste Management.

Environmental Protection Act, R.R.O. 1990, Regulation 362, No Amendments, Waste Management – PCB's.

Occupational Health and Safety Act, R.R.O. 1990, Regulation 837, Amended to O. Reg. 490/09, Designated Substance – Asbestos.

Occupation Health and Safety Act, R.R.O. 1990, Regulation 843, Amended to O. Reg. 490/09, Designated Substance – Lead.

Occupational Health and Safety Act, R.R.O. 1990, Regulation 844, Amended to O. Reg. 490/09, Designated Substance – Mercury.

Occupation Health and Safety Act, R.R.O. 1990, Regulation 845, Amended to O. Reg. 490/09, Designated Substance – Silica.

Occupation Health and Safety Act, R.R.O. 1990, Ontario Regulation 278/05 (amended to O. Reg. 493/09), No Amendments, Designated Substance — Asbestos on Construction Projects and in Buildings and Repair Operations.

Environment Canada Report EPS 2/CC/2, Identification of Lamp Ballasts Containing PCBs, Rev. August 1991.

Canadian Environmental Protection Act, 1999, Chlorobiphenyls Regulations, [SOR/91-152].

Canadian Environmental Protection Act, 1999, Storage of PCB Material Regulations, [SOR/92-507].

Treasury Board of Canada Secretariat “Hazardous Substances Directive”, April 19, 1999.

Ontario Ministry of Labour “Hazard Alert – Mould in Workplace Buildings”, December 2000.

Ontario Ministry of Labour “Guideline on Lead on Construction Projects”, September 2004.

Canadian Construction Association, Standard Construction Document CCA 82 2004, “Mould Guidelines for the Canadian Construction Industry”, 2004.

Environmental Abatement Council of Ontario (EACO), “Mould Abatement Guidelines”, 2004.

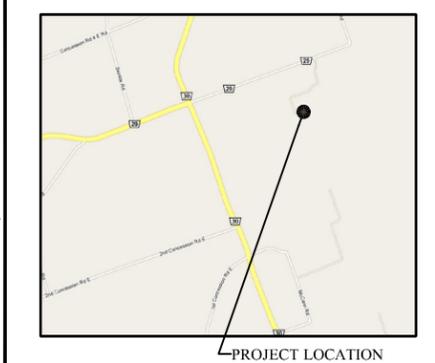
“Designated Substances and Hazardous Materials Survey, Warkworth Institution, Campbellford, Ontario” prepared by XCG Consultants Ltd., 2005.



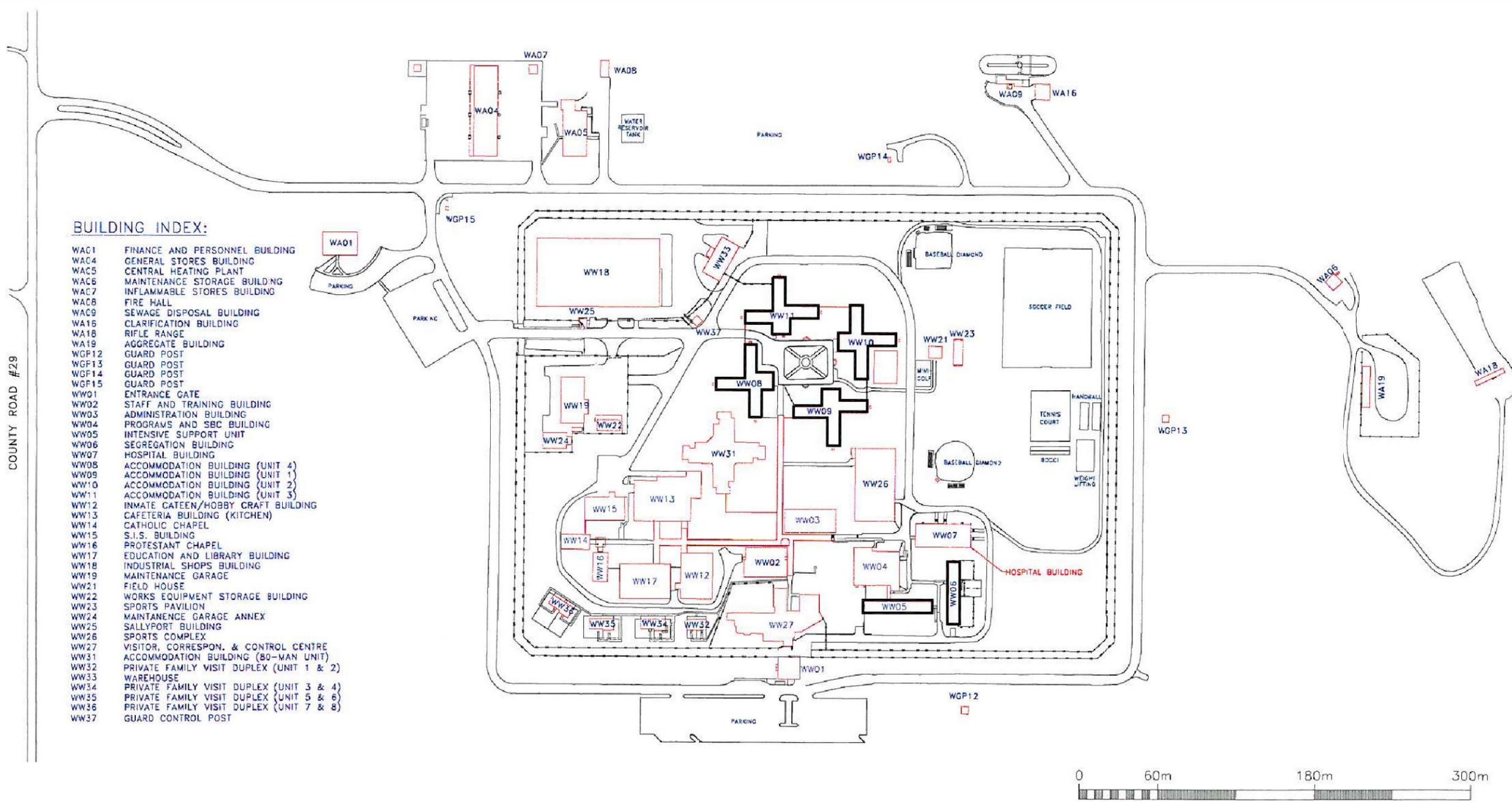
APPENDIX A
ANNOTATED FLOOR PLANS



KEY MAP



PROJECT LOCATION



BUILDING INDEX:

- WA01 FINANCE AND PERSONNEL BUILDING
- WA04 GENERAL STORES BUILDING
- WA05 CENTRAL HEATING PLANT
- WA06 MAINTENANCE STORAGE BUILDING
- WA07 INFLAMMABLE STORES BUILDING
- WA08 FIRE HALL
- WA09 SEWAGE DISPOSAL BUILDING
- WA16 CLARIFICATION BUILDING
- WA18 RIFLE RANGE
- WA19 AGGREGATE BUILDING
- WGP12 GUARD POST
- WGP13 GUARD POST
- WGP14 GUARD POST
- WGP15 GUARD POST
- WW01 ENTRANCE GATE
- WW02 STAFF AND TRAINING BUILDING
- WW03 ADMINISTRATION BUILDING
- WW04 PROGRAMS AND SBC BUILDING
- WW05 INTENSIVE SUPPORT UNIT
- WW06 SEGREGATION BUILDING
- WW07 HOSPITAL BUILDING
- WW08 ACCOMMODATION BUILDING (UNIT 4)
- WW09 ACCOMMODATION BUILDING (UNIT 1)
- WW10 ACCOMMODATION BUILDING (UNIT 2)
- WW11 ACCOMMODATION BUILDING (UNIT 3)
- WW12 INMATE CATEEN/HOBBY CRAFT BUILDING
- WW13 CAFETERIA BUILDING (KITCHEN)
- WW14 CATHOLIC CHAPEL
- WW15 S.I.S. BUILDING
- WW16 PROTESTANT CHAPEL
- WW17 EDUCATION AND LIBRARY BUILDING
- WW18 INDUSTRIAL SHOPS BUILDING
- WW19 MAINTENANCE GARAGE
- WW21 FIELD HOUSE
- WW22 WORKS EQUIPMENT STORAGE BUILDING
- WW23 SPORTS PAVILION
- WW24 MAINTENANCE GARAGE ANNEX
- WW25 SALLYPORT BUILDING
- WW26 SPORTS COMPLEX
- WW27 VISITOR, CORRESPON. & CONTROL CENTRE
- WW31 ACCOMMODATION BUILDING (80-MAN UNIT)
- WW32 PRIVATE FAMILY VISIT DUPLEX (UNIT 1 & 2)
- WW33 WAREHOUSE
- WW34 PRIVATE FAMILY VISIT DUPLEX (UNIT 3 & 4)
- WW35 PRIVATE FAMILY VISIT DUPLEX (UNIT 5 & 6)
- WW36 PRIVATE FAMILY VISIT DUPLEX (UNIT 7 & 8)
- WW37 GUARD CONTROL POST

DRAWING REFERENCE: Base drawing supplied by PWGSC.
 NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

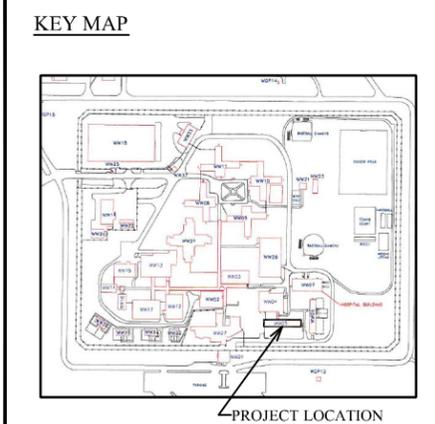
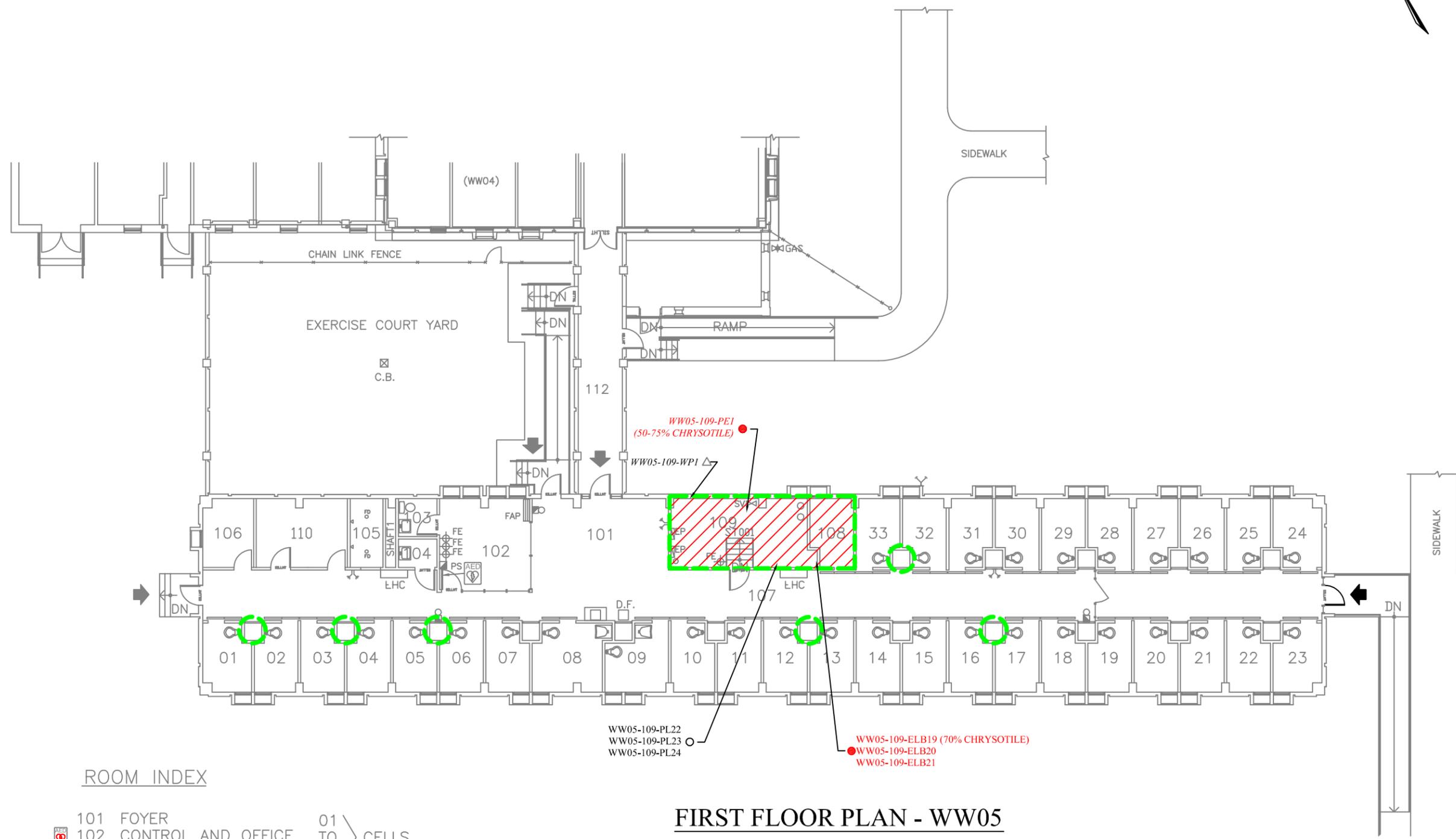
TITLE: **DSHMS**
SITE PLAN

LOCATION: **WARKWORTH INSTITUTION**
CAMPBELLFORD, ONTARIO



DATE: 29 MAR 10 DRAWN: GGM FIGURE: 1
 PROJECT No: 1-336-163-01

COUNTY ROAD #29



- LEGEND**
- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
 - △ NON-LEAD BASED PAINT (<600 ppm)
 - CONFIRMED ASBESTOS SAMPLING LOCATION
 - NON-ASBESTOS CONTAINING
 - ITALIC TEXT INDICATES 2005 DSHM SAMPLING*
 - 25-10-PL SAMPLE ID
 - OBSERVED AREA
- SAMPLE ID ACRONYMS**
- ELB - ELBOW INSULATION
 - PL - PLASTER
- ▨ ASBESTOS CONTAINING MATERIALS

DRAWING REFERENCE: Base drawing supplied by PWGSC.

NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

TITLE: **DSHMS
INTENSIVE SUPPORT UNIT WW05
SAMPLE LOCATIONS**

LOCATION: **WARKWORTH INSTITUTION
CAMPBELLFORD, ONTARIO**



DATE: 31 MAR 10 DRAWN: GGM FIGURE: 2

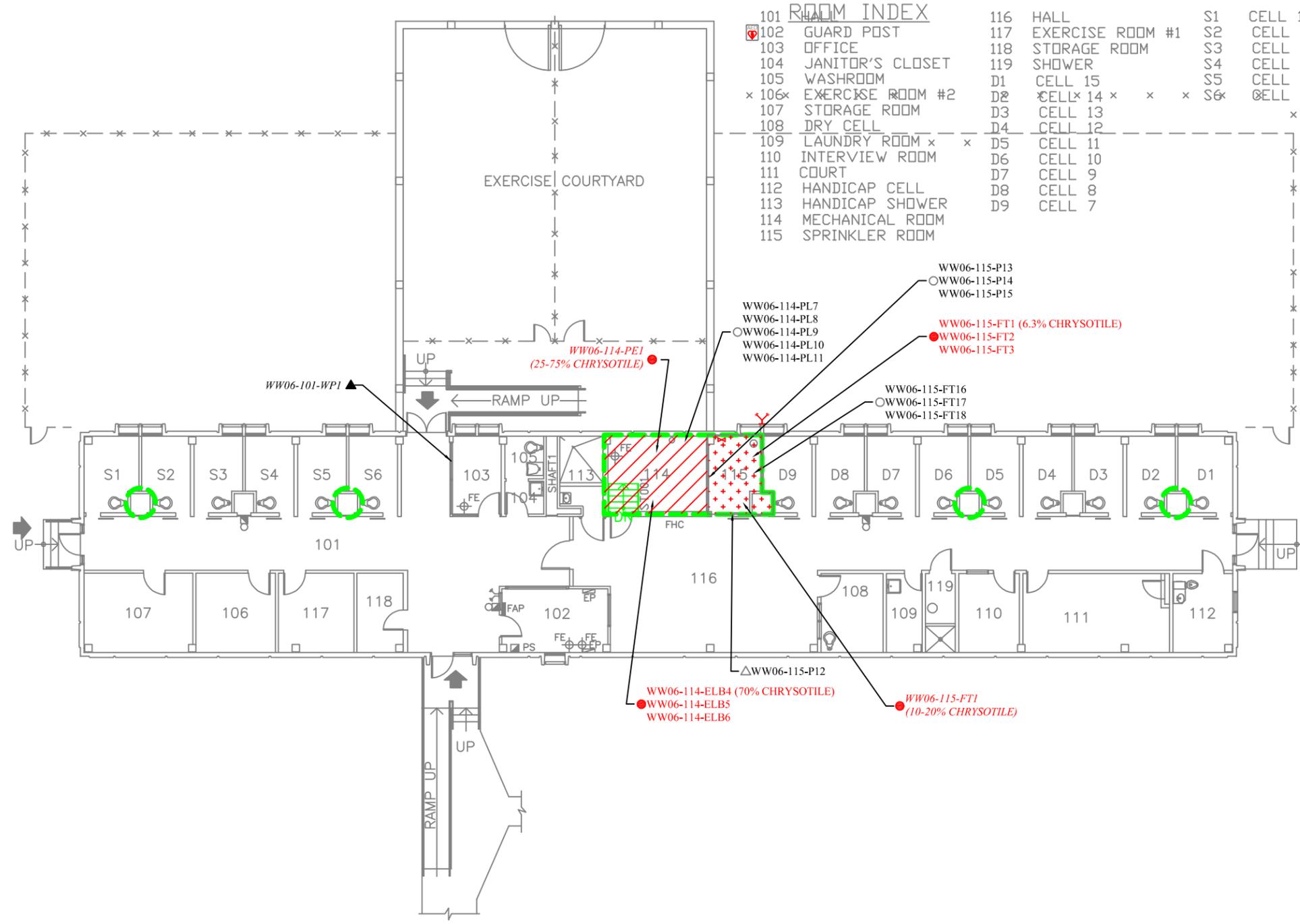
PROJECT No: 1-336-163-01

ROOM INDEX

101 FOYER	01	} CELLS
102 CONTROL AND OFFICE	TO	
103 LAVATORY	03	} CELLS
104 JANITOR'S CLOSET	33	
105 SHOWERS		
106 OFFICE		
107 CORRIDOR		
108 LAUNDRY ROOM		
109 MECHANICAL ROOM		
110 OFFICE		
112 CORRIDOR LINK		

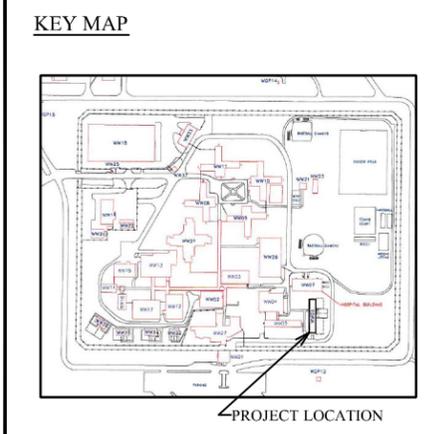
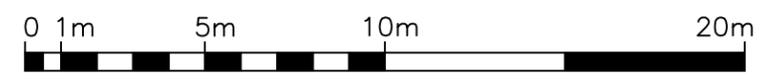
FIRST FLOOR PLAN - WW05





ROOM INDEX			
101	HALL	S1	CELL 1
102	GUARD POST	S2	CELL 2
103	OFFICE	S3	CELL 3
104	JANITOR'S CLOSET	S4	CELL 4
105	WASHROOM	S5	CELL 5
106	EXERCISE ROOM #2	S6	CELL 6
107	STORAGE ROOM	D1	CELL 15
108	DRY CELL	D2	CELL 14
109	LAUNDRY ROOM	D3	CELL 13
110	INTERVIEW ROOM	D4	CELL 12
111	COURT	D5	CELL 11
112	HANDICAP CELL	D6	CELL 10
113	HANDICAP SHOWER	D7	CELL 9
114	MECHANICAL ROOM	D8	CELL 8
115	SPRINKLER ROOM	D9	CELL 7

FIRST FLOOR PLAN - WW06



LEGEND

- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
- △ NON-LEAD BASED PAINT (<600 ppm)
- CONFIRMED ASBESTOS SAMPLING LOCATION
- NON-ASBESTOS CONTAINING

ITALIC TEXT INDICATES 2005 DSHM SAMPLING

25-10-PL# SAMPLE ID

- OBSERVED AREA

SAMPLE ID ACRONYMS

- PL - PLASTER
- ELB OR PE1 - PLASTER ELBOW
- FT - FLOOR TILE

- ▨ ASBESTOS CONTAINING MATERIALS
- ▤ ASBESTOS CONTAINING FLOOR TILES

DRAWING REFERENCE: Base drawing supplied by PWGSC.

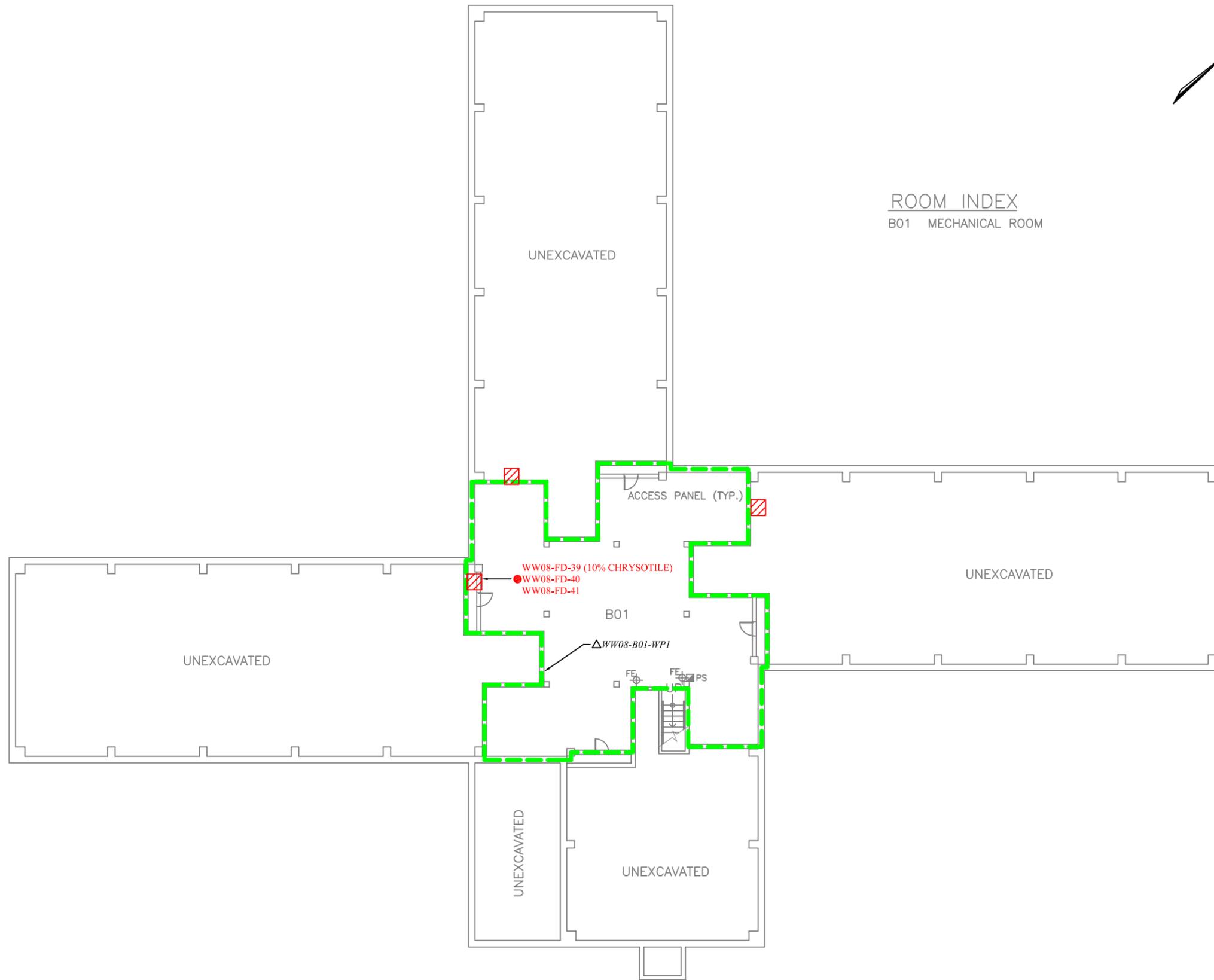
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

TITLE:
**DSHMS
DISSOCIATION WW06
SAMPLE LOCATIONS**

LOCATION:
**WARKWORTH INSTITUTION
CAMPBELLFORD, ONTARIO**



DATE: 29 MAR 10	DRAWN: GGM	FIGURE: 3
PROJECT No: 1-336-163-01		

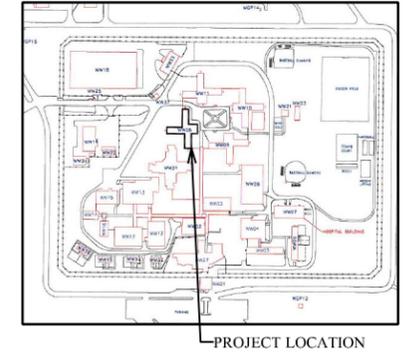


ROOM INDEX
B01 MECHANICAL ROOM

BASEMENT PLAN - WW08



KEY MAP



LEGEND

- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
 - △ NON-LEAD BASED PAINT (<600 ppm)
 - CONFIRMED ASBESTOS SAMPLING LOCATION
 - NON-ASBESTOS CONTAINING
- ITALIC TEXT INDICATES 2005 DSHM SAMPLING*

25-10-PL E SAMPLE ID

○ OBSERVED AREA

SAMPLE ID ACRONYMS

FD - FIRE DAMPER GASKET
P - PAINT

▨ ASBESTOS CONTAINING MATERIALS

DRAWING REFERENCE: Base drawing supplied by PWGSC.

NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

TITLE:
**DSHMS
ACCOMMODATION (UNIT 4) WW08
SAMPLE LOCATIONS - BASEMENT**

LOCATION:
**WARKWORTH INSTITUTION
CAMPBELLFORD, ONTARIO**



XCG Consultants Ltd. www.xcg.com
Oakville • Kitchener • Kingston • Edmonton • Cincinnati

DATE: 26 MAR 10 DRAWN: GGM FIGURE:

PROJECT No:
1-336-163-01

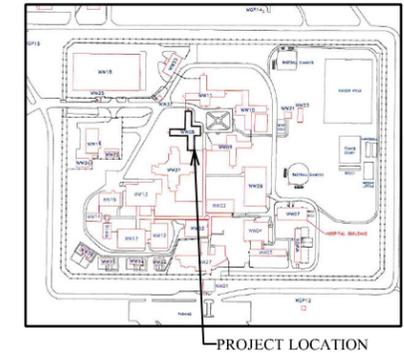


ROOM INDEX

B01 } CELL	F01 } CELL
B17 } CELL	F17 } CELL
B18 STORAGE	F18 STORAGE
B19 JANITOR'S CLOSET	F19 JANITOR'S CLOSET
B20 SHOWERS	F20 SHOWERS
B21 CORRIDOR	F21 CORRIDOR
D01 } CELL	H101 UNIT MGMT. OFFICE
D17 } CELL	H102 STORAGE
D18 STORAGE	H103 WASHROOM
D19 JANITOR'S CLOSET	H104 OFFICE
D20 SHOWERS	H105 OFFICE
D21 CORRIDOR	H106 CASE PREP. OFFICE
	H107 CASE PREP. OFFICE
	H108 UNIT MGMT. OFFICE
	H109 CORRIDOR



KEY MAP



LEGEND

- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
- △ NON-LEAD BASED PAINT (<600 ppm)
- CONFIRMED ASBESTOS SAMPLING LOCATION
- NON-ASBESTOS CONTAINING
- ITALIC TEXT INDICATES 2005 DSHM SAMPLING*
- 25-10-PL E SAMPLE ID
- OBSERVED AREA

NOTE:
 * THE SECOND FLOOR ACCESS HATCH ALLOWED FOR VISUALLY INSPECTION OF THE ENTIRE VERTICAL PIPE CHASE FROM THE GROUND FLOOR TO THE ATTIC.

DRAWING REFERENCE: Base drawing supplied by PWGSC.

NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

TITLE:
**DSHMS
 ACCOMMODATION (UNIT 4) WW08
 SAMPLE LOCATIONS- 2nd FLOOR**

LOCATION:
**WARKWORTH INSTITUTION
 CAMPBELLFORD, ONTARIO**

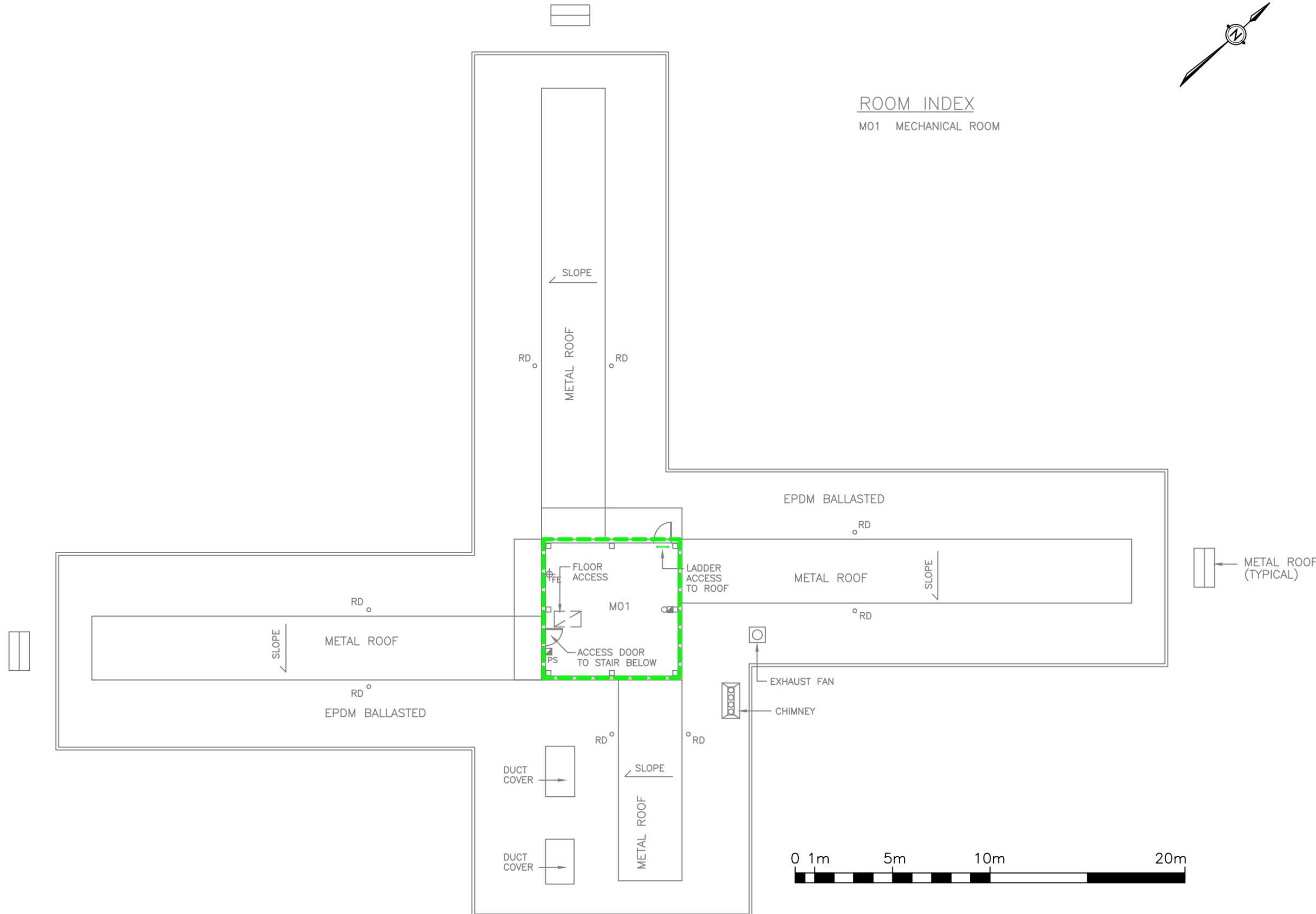


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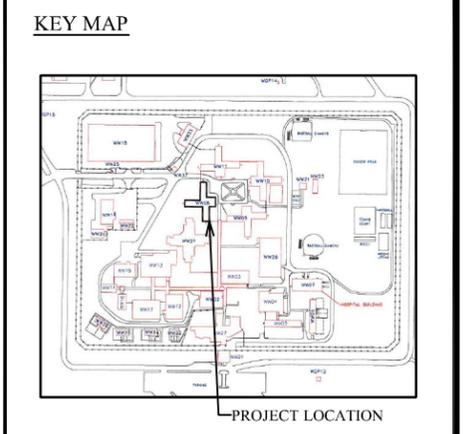
DATE: 26 MAR 10	DRAWN: GGM	FIGURE: 5
PROJECT No: 1-336-163-01		

SECOND FLOOR PLAN - WW08





ROOM INDEX
M01 MECHANICAL ROOM



- LEGEND**
- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
 - △ NON-LEAD BASED PAINT (<600 ppm)
 - CONFIRMED ASBESTOS SAMPLING LOCATION
 - NON-ASBESTOS CONTAINING
 - ITALIC TEXT INDICATES 2005 DSHM SAMPLING*
 - 25-10-PLE SAMPLE ID
 - OBSERVED AREA

DRAWING REFERENCE: Base drawing supplied by PWGSC.
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

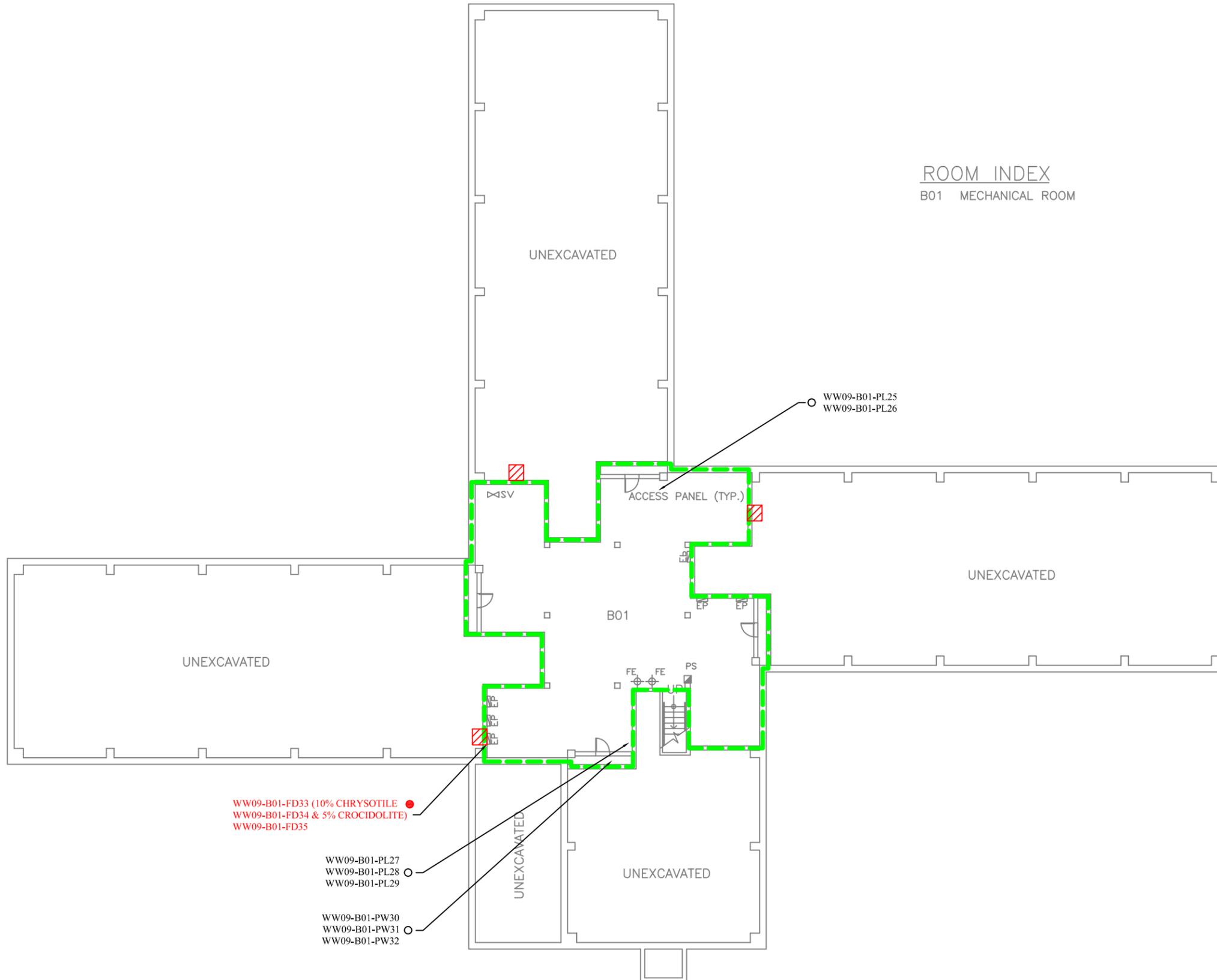
TITLE:
**DSHMS
ACCOMMODATION (UNIT 4) WW08
SAMPLE LOCATIONS- ATTIC SPACE**

LOCATION:
**WARKWORTH INSTITUTION
CAMPBELLFORD, ONTARIO**

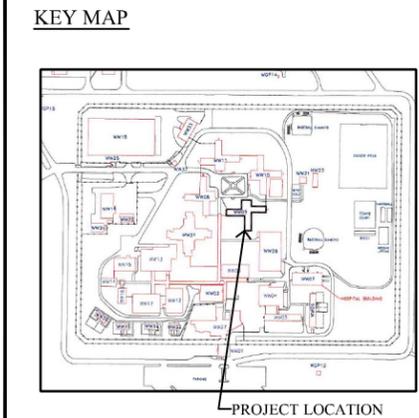


DATE: 26 MAR 10	DRAWN: GGM	FIGURE: 6
PROJECT No: 1-336-163-01		

ROOF PLAN & MECHANICAL ROOM PLAN - WW08



ROOM INDEX
B01 MECHANICAL ROOM



- LEGEND**
- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
 - △ NON-LEAD BASED PAINT (<600 ppm)
 - CONFIRMED ASBESTOS SAMPLING LOCATION
 - NON-ASBESTOS CONTAINING
- ITALIC TEXT INDICATES 2005 DSHM SAMPLING*
- 25-10-PL- SAMPLE ID
- OBSERVED AREA
- SAMPLE ID ACRONYMS**
- FD - FIRE DAMPER GASKET
 - P - PAINT
- ▨ ASBESTOS CONTAINING MATERIALS

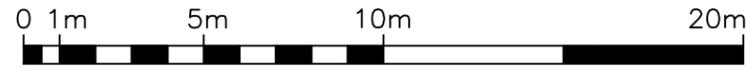
WW09-B01-FD33 (10% CHRYSOTILE)
WW09-B01-FD34 & 5% CROCIDOLITE)
WW09-B01-FD35

WW09-B01-PL27
WW09-B01-PL28
WW09-B01-PL29

WW09-B01-PW30
WW09-B01-PW31
WW09-B01-PW32

WW09-B01-PL25
WW09-B01-PL26

BASEMENT PLAN - WW09



DRAWING REFERENCE: Base drawing supplied by PWGSC.
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

TITLE:
**DSHMS
ACCOMMODATION (UNIT 1) WW09
SAMPLE LOCATIONS - BASEMENT**

LOCATION:
**WARKWORTH INSTITUTION
CAMPBELLFORD, ONTARIO**



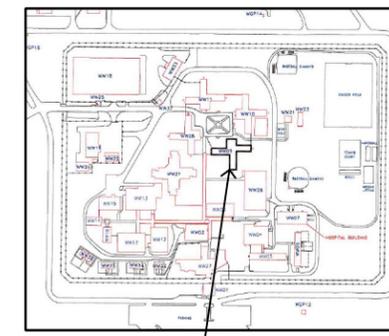
DATE: 31 MAR 10	DRAWN: GGM	FIGURE: 7
PROJECT No: 1-336-163-01		



ROOM INDEX

B01 } CELL	F01 } CELL
B17 } CELL	F17 } CELL
B18 STORAGE	F18 STORAGE
B19 JANITOR'S CLOSET	F19 JANITOR'S CLOSET
B20 SHOWERS	F20 SHOWERS
B21 CORRIDOR	F21 CORRIDOR
D01 } CELL	H101 UNIT MGMT. OFFICE
D17 } CELL	H102 STORAGE
D18 STORAGE	H103 WASHROOM
D19 JANITOR'S CLOSET	H104 OFFICE
D20 SHOWERS	H105 OFFICE
D21 CORRIDOR	H106 CASE PREP. OFFICE
	H107 CASE PREP. OFFICE
	H108 UNIT MGMT. OFFICE
	H109 CORRIDOR

KEY MAP



PROJECT LOCATION

LEGEND

- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
- △ NON-LEAD BASED PAINT (<600 ppm)
- CONFIRMED ASBESTOS SAMPLING LOCATION
- NON-ASBESTOS CONTAINING
- ITALIC TEXT INDICATES 2005 DSHM SAMPLING*
- 25-10-PL E SAMPLE ID
- OBSERVED AREA

DRAWING REFERENCE: Base drawing supplied by PWGSC.

NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

TITLE:
**DSHMS
ACCOMMODATION (UNIT 1) WW09
SAMPLE LOCATIONS - 2nd FLOOR**

LOCATION:
**WARKWORTH INSTITUTION
CAMPBELLFORD, ONTARIO**



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DATE: 31 MAR 10	DRAWN: GGM	FIGURE: 8
PROJECT No: 1-336-163-01		

SECOND FLOOR PLAN - WW09

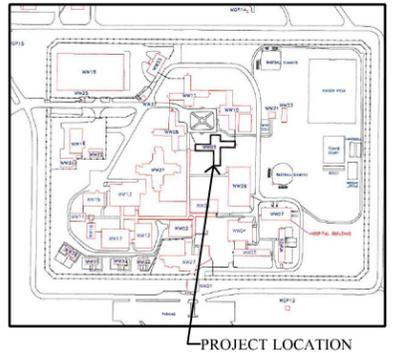


NOTE:
* THE SECOND FLOOR ACCESS HATCH ALLOWED FOR VISUALLY INSPECTION OF THE ENTIRE VERTICAL PIPE CHASE FROM THE GROUND FLOOR TO THE ATTIC.

ROOM INDEX
M01 MECHANICAL ROOM

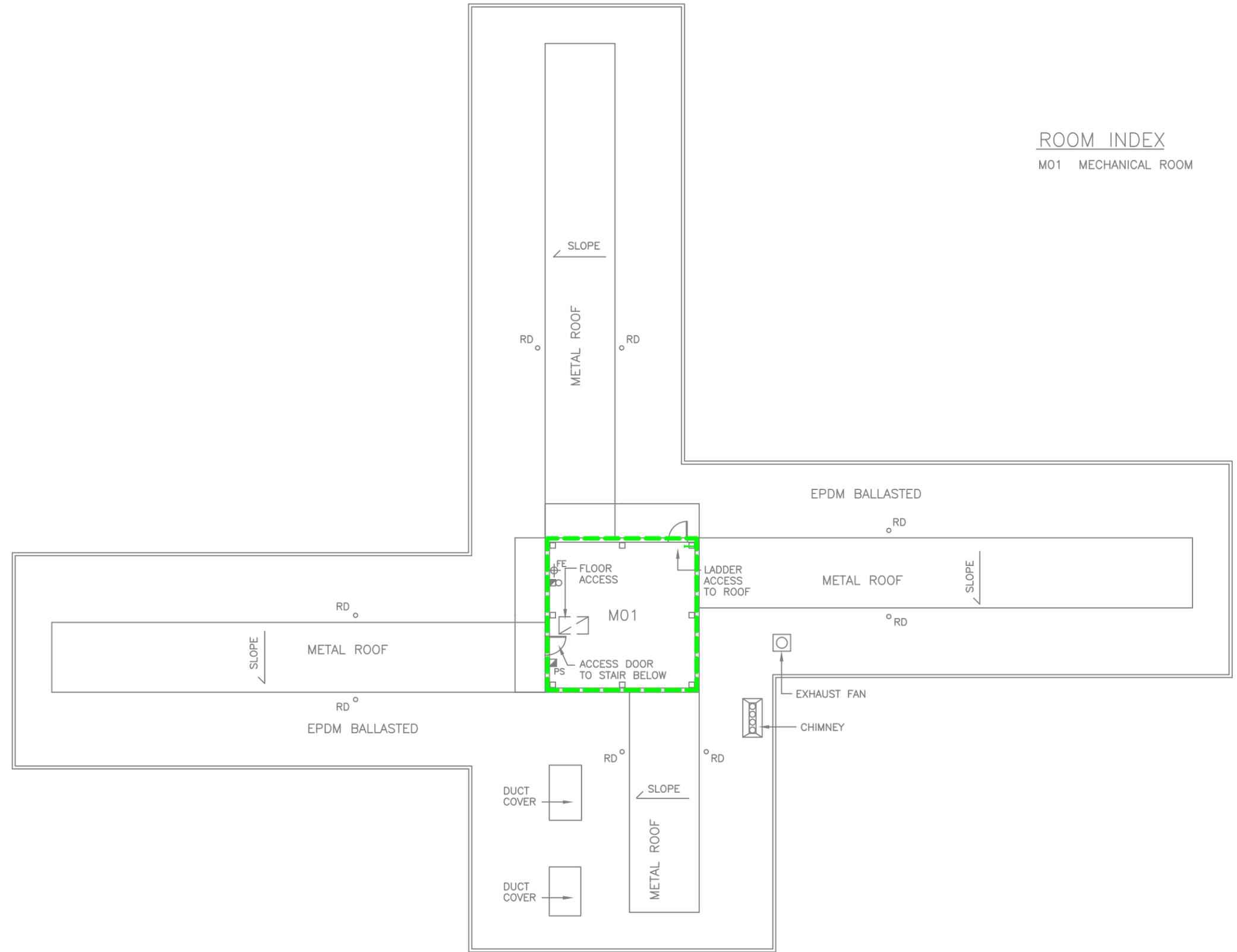


KEY MAP

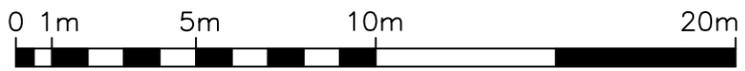


LEGEND

- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
- △ NON-LEAD BASED PAINT (<600 ppm)
- CONFIRMED ASBESTOS SAMPLING LOCATION
- NON-ASBESTOS CONTAINING
- ITALIC TEXT INDICATES 2005 DSHM SAMPLING*
- 25-10-PL E SAMPLE ID
- OBSERVED AREA



ROOF PLAN & MECHANICAL ROOM PLAN - WW09



DRAWING REFERENCE: Base drawing supplied by PWGSC.
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

TITLE:
**DSHMS
ACCOMMODATION (UNIT 1) WW09
SAMPLE LOCATIONS - ATTIC**

LOCATION:
**WARKWORTH INSTITUTION
CAMPBELLFORD, ONTARIO**

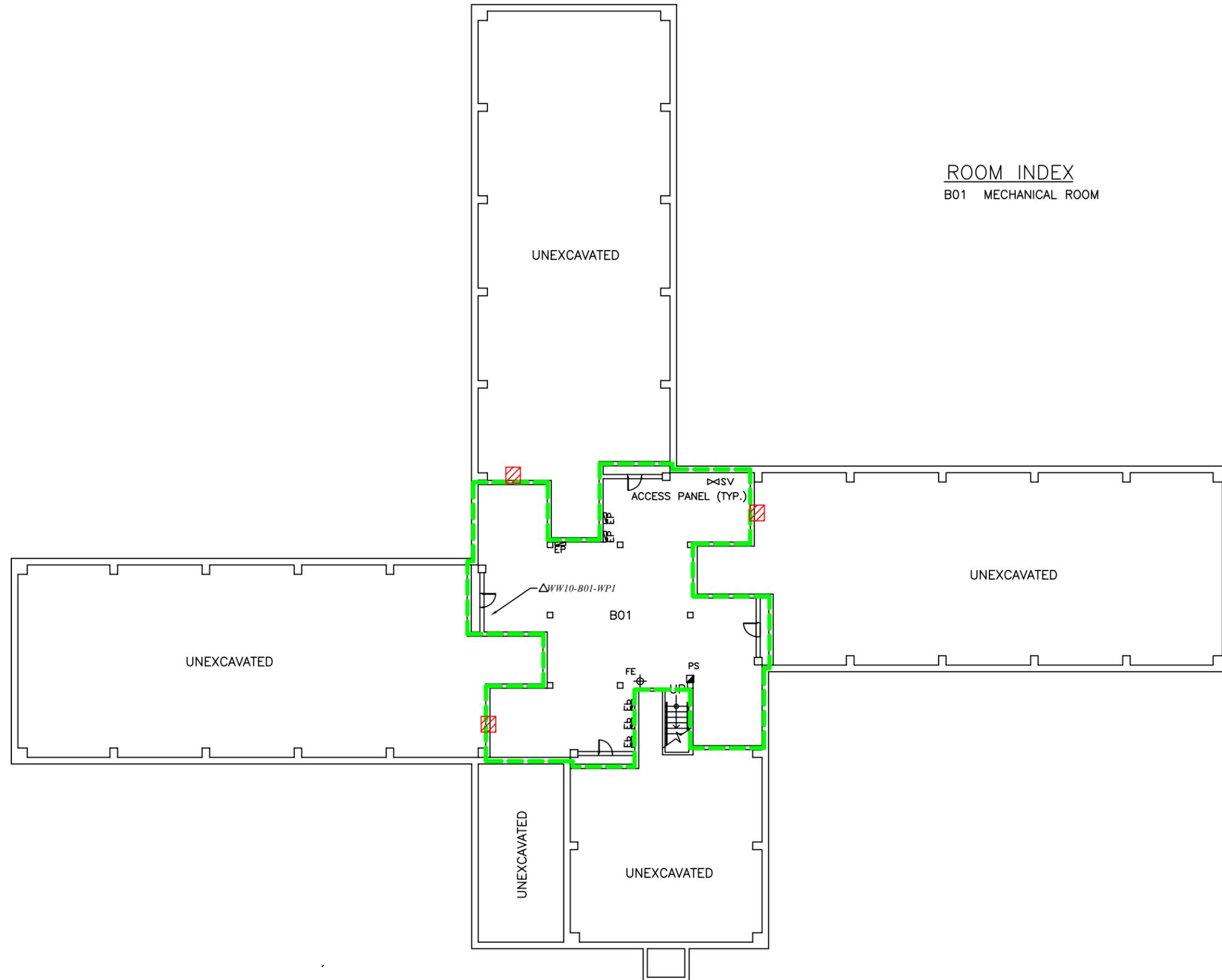


DATE:
26 MAR 10

DRAWN:
GGM

PROJECT No:
1-336-163-01

FIGURE:
9

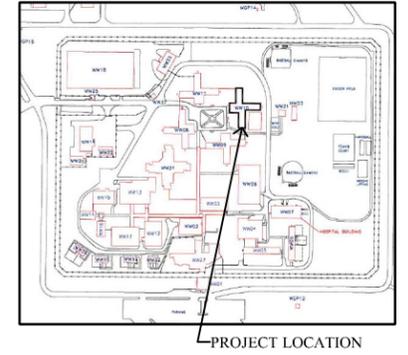


BASEMENT PLAN - WW10

ROOM INDEX
B01 MECHANICAL ROOM



KEY MAP



LEGEND

- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
 - △ NON-LEAD BASED PAINT (<600 ppm)
 - CONFIRMED ASBESTOS SAMPLING LOCATION
 - NON-ASBESTOS CONTAINING
- ITALIC TEXT INDICATES 2005 DSHM SAMPLING*

25-10-PLE SAMPLE ID



SAMPLE ID ACRONYMS

- FD - FIRE DAMPER GASKET
- P - PAINT



DRAWING REFERENCE: Base drawing supplied by PWGSC.

NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

TITLE:
**DSHMS
ACCOMMODATION (UNIT 2) WW10
SAMPLE LOCATIONS - BASEMENT**

LOCATION:
**WARKWORTH INSTITUTION
CAMPBELLFORD, ONTARIO**



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DATE: 26 MAR 10 DRAWN: GGM

PROJECT No: 1-336-163-01

FIGURE:
10

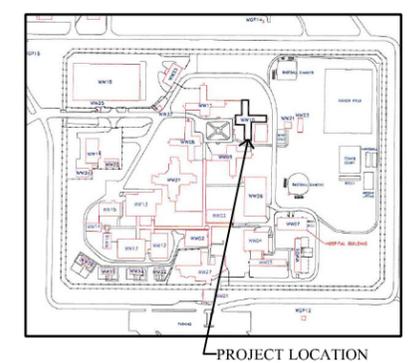


ROOM INDEX

B01 } CELL	F01 } CELL
B17 } CELL	F17 } CELL
B18 STORAGE	F18 STORAGE
B19 JANITOR'S CLOSET	F19 JANITOR'S CLOSET
B20 LAUNDRY	F20 SHOWERS
B21 CORRIDOR	F21 CORRIDOR
B22 SHOWER	
	H101 UNIT MGMT. OFFICE
	H102 STORAGE
	H103 WASHROOM
	H104 OFFICE
	H105 OFFICE
	H106 CASE PREP. OFFICE
	H107 CASE PREP. OFFICE
	H108 UNIT MGMT. OFFICE
	H109 CORRIDOR

D01 } CELL
D17 } CELL
D18 STORAGE
D19 JANITOR'S CLOSET
D20 SHOWERS
D21 CORRIDOR

KEY MAP



LEGEND

- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
 - △ NON-LEAD BASED PAINT (<600 ppm)
 - CONFIRMED ASBESTOS SAMPLING LOCATION
 - NON-ASBESTOS CONTAINING
- ITALIC TEXT INDICATES 2005 DSHM SAMPLING*
- 25-10-PLE SAMPLE ID
- OBSERVED AREA

DRAWING REFERENCE: Base drawing supplied by PWGSC.

NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

TITLE: **DSHMS ACCOMMODATION (UNIT 2) WW10 SAMPLE LOCATIONS - 2nd FLOOR**

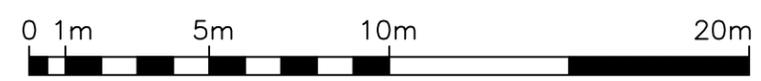
LOCATION: **WARKWORTH INSTITUTION CAMPBELLFORD, ONTARIO**



DATE: 31 MAR 10 DRAWN: GGM FIGURE: 11

PROJECT No: 1-336-163-01

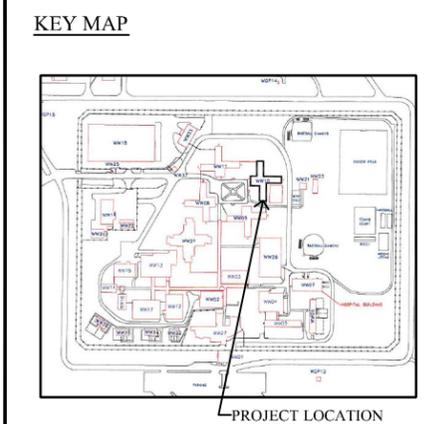
SECOND FLOOR PLAN - WW10



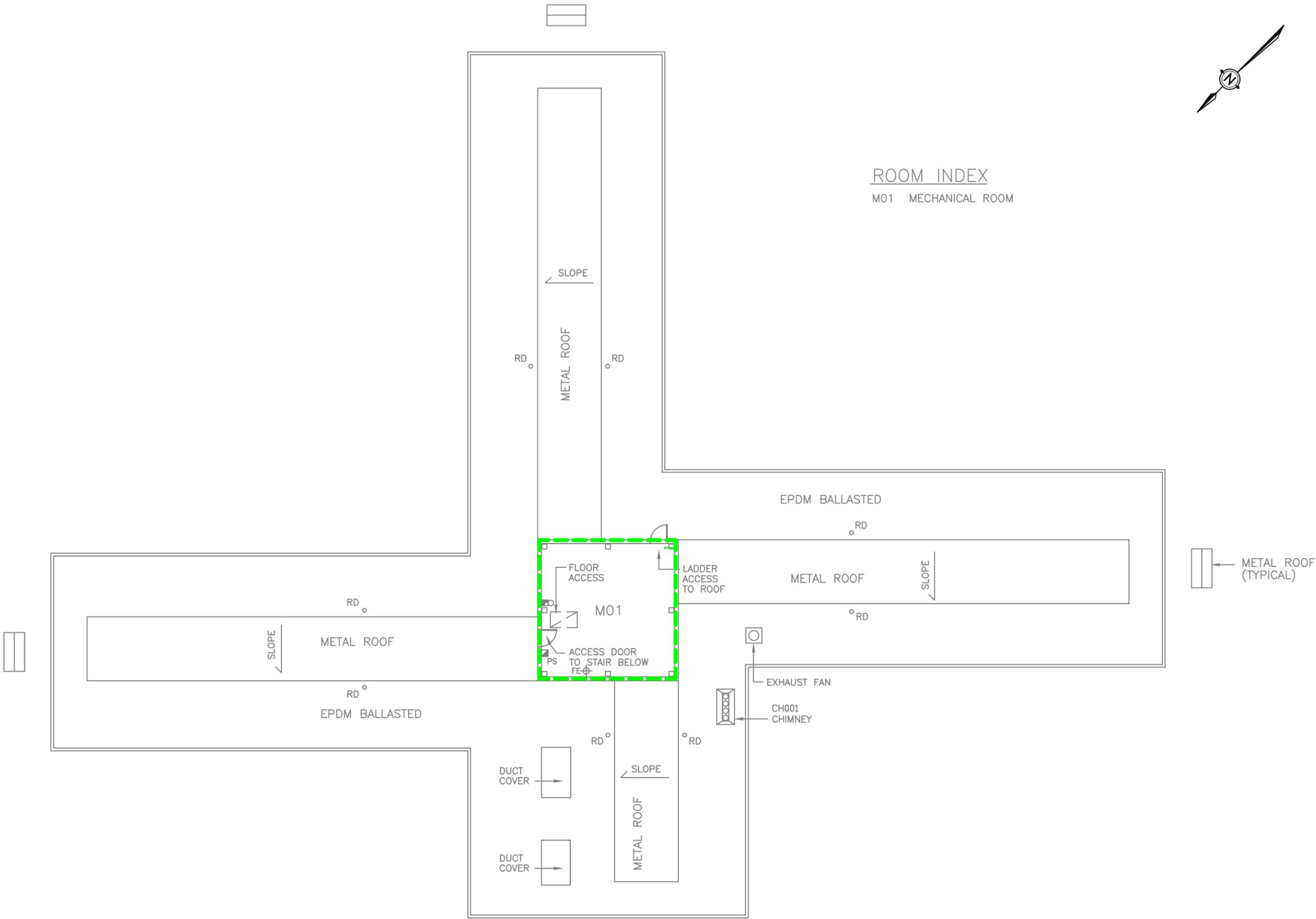
NOTE:
* THE SECOND FLOOR ACCESS HATCH ALLOWED FOR VISUALLY INSPECTION OF THE ENTIRE VERTICAL PIPE CHASE FROM THE GROUND FLOOR TO THE ATTIC.

● WW10-102-PE1 (50-75% CHRYSOTILE)
(LOCATED ON FIRST FLOOR IN THIS LOCATION)

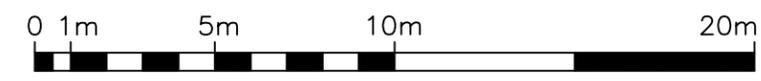
ROOM INDEX
M01 MECHANICAL ROOM



- LEGEND**
- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
 - △ NON-LEAD BASED PAINT (<600 ppm)
 - CONFIRMED ASBESTOS SAMPLING LOCATION
 - NON-ASBESTOS CONTAINING
 - ITALIC TEXT INDICATES 2005 DSHM SAMPLING*
 - 25-10-PL- SAMPLE ID
 - OBSERVED AREA



ROOF PLAN & MECHANICAL ROOM PLAN - WW10



DRAWING REFERENCE: Base drawing supplied by PWGSC.
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

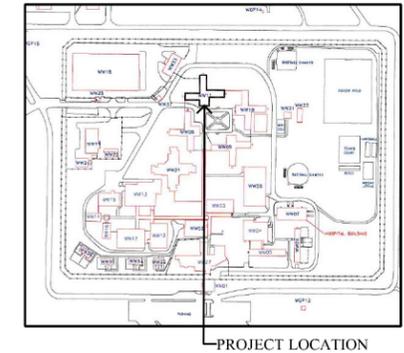
TITLE:
**DSHMS
ACCOMMODATION (UNIT 2) WW10
SAMPLE LOCATIONS - ATTIC**

LOCATION:
**WARKWORTH INSTITUTION
CAMPBELLFORD, ONTARIO**



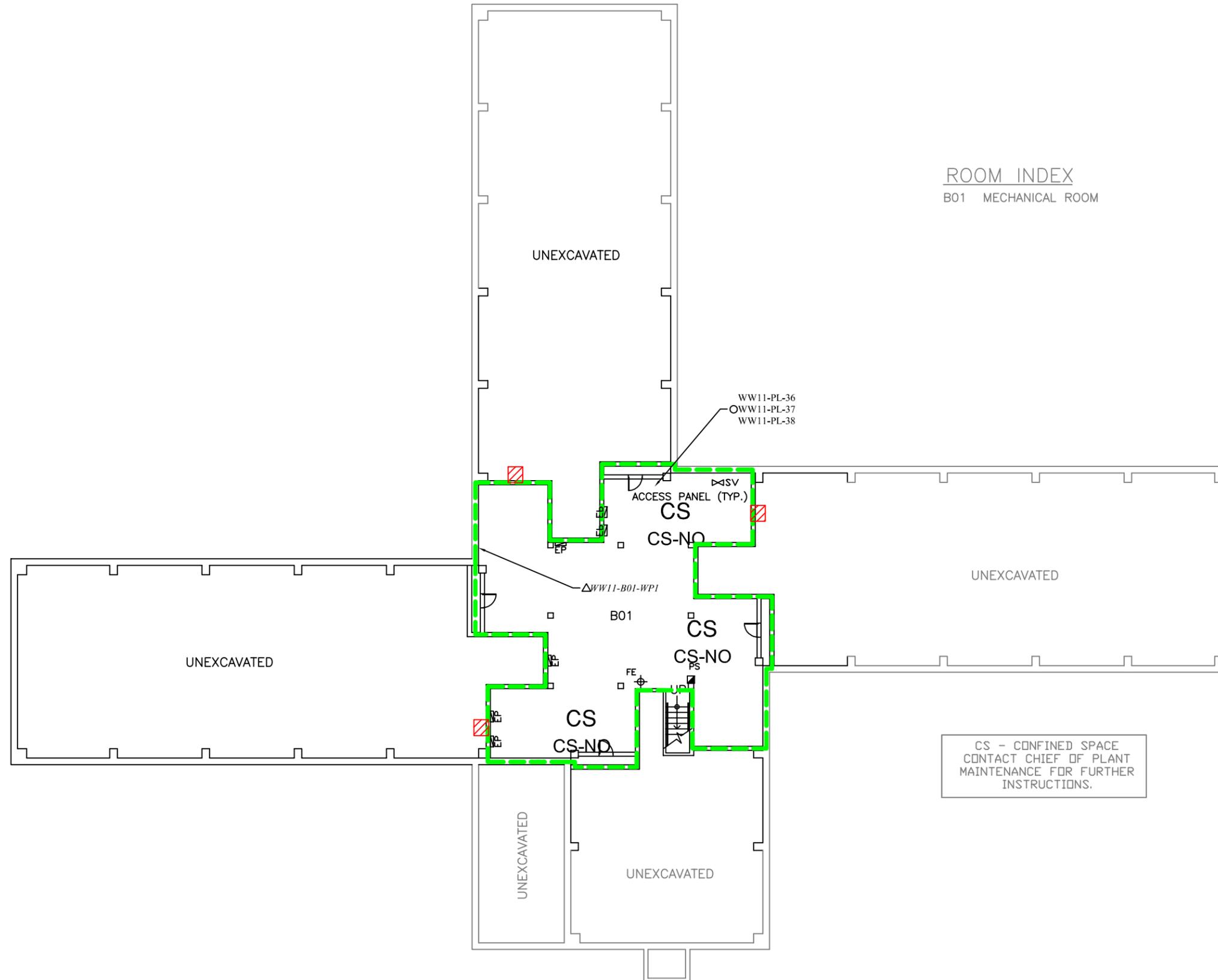
DATE: 26 MAR 10	DRAWN: GGM	FIGURE: 12
PROJECT No: 1-336-163-01		

KEY MAP



PROJECT LOCATION

ROOM INDEX
B01 MECHANICAL ROOM



BASEMENT PLAN - WW11



LEGEND

- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
- △ NON-LEAD BASED PAINT (<600 ppm)
- CONFIRMED ASBESTOS SAMPLING LOCATION
- NON-ASBESTOS CONTAINING
- ITALIC TEXT INDICATES 2005 DSHM SAMPLING*

25-10-PL SAMPLE ID



SAMPLE ID ACRONYMS

- FD - FIRE DAMPER GASKET
- P - PAINT
- PL - PLASTER



DRAWING REFERENCE: Base drawing supplied by PWGSC.

NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

TITLE:
**DSHMS
ACCOMMODATION (UNIT 3) WW11
SAMPLE LOCATIONS - BASEMENT**

LOCATION:
**WARKWORTH INSTITUTION
CAMPBELLFORD, ONTARIO**



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DATE: 26 MAR 10	DRAWN: GGM	FIGURE: 13
PROJECT No: 1-336-163-01		

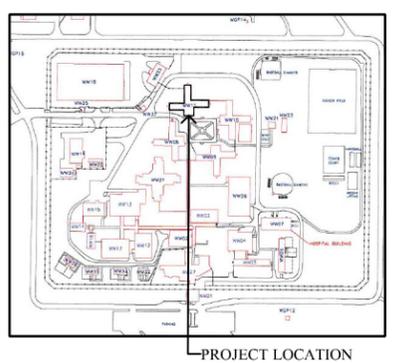


ROOM INDEX

B01 } CELL	F01 } CELL
B17 } CELL	F17 } CELL
B18 STORAGE	F18 STORAGE
B19 JANITOR'S CLOSET	F19 JANITOR'S CLOSET
B20 SHOWERS	F20 SHOWERS
B21 CORRIDOR	F21 CORRIDOR
D01 } CELL	H101 UNIT MGMT. OFFICE
D17 } CELL	H102 STORAGE
D18 STORAGE	H103 WASHROOM
D19 JANITOR'S CLOSET	H104 OFFICE
D20 SHOWERS	H105 OFFICE
D21 CORRIDOR	H106 CASE PREP. OFFICE
	H107 CASE PREP. OFFICE
	H108 UNIT MGMT. OFFICE
	H109 CORRIDOR



KEY MAP



LEGEND

- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
- △ NON-LEAD BASED PAINT (<600 ppm)
- CONFIRMED ASBESTOS SAMPLING LOCATION
- NON-ASBESTOS CONTAINING
- ITALIC TEXT INDICATES 2005 DSHM SAMPLING*
- 25-10-PLE SAMPLE ID
- OBSERVED AREA

NOTE:
 * THE SECOND FLOOR ACCESS HATCH ALLOWED FOR VISUALLY INSPECTION OF THE ENTIRE VERTICAL PIPE CHASE FROM THE GROUND FLOOR TO THE ATTIC..

DRAWING REFERENCE: Base drawing supplied by PWGSC.
 NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

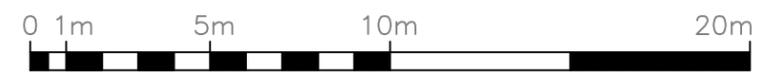
TITLE:
**DSHMS
 ACCOMMODATION (UNIT 3) WW11
 SAMPLE LOCATIONS - 2nd FLOOR**

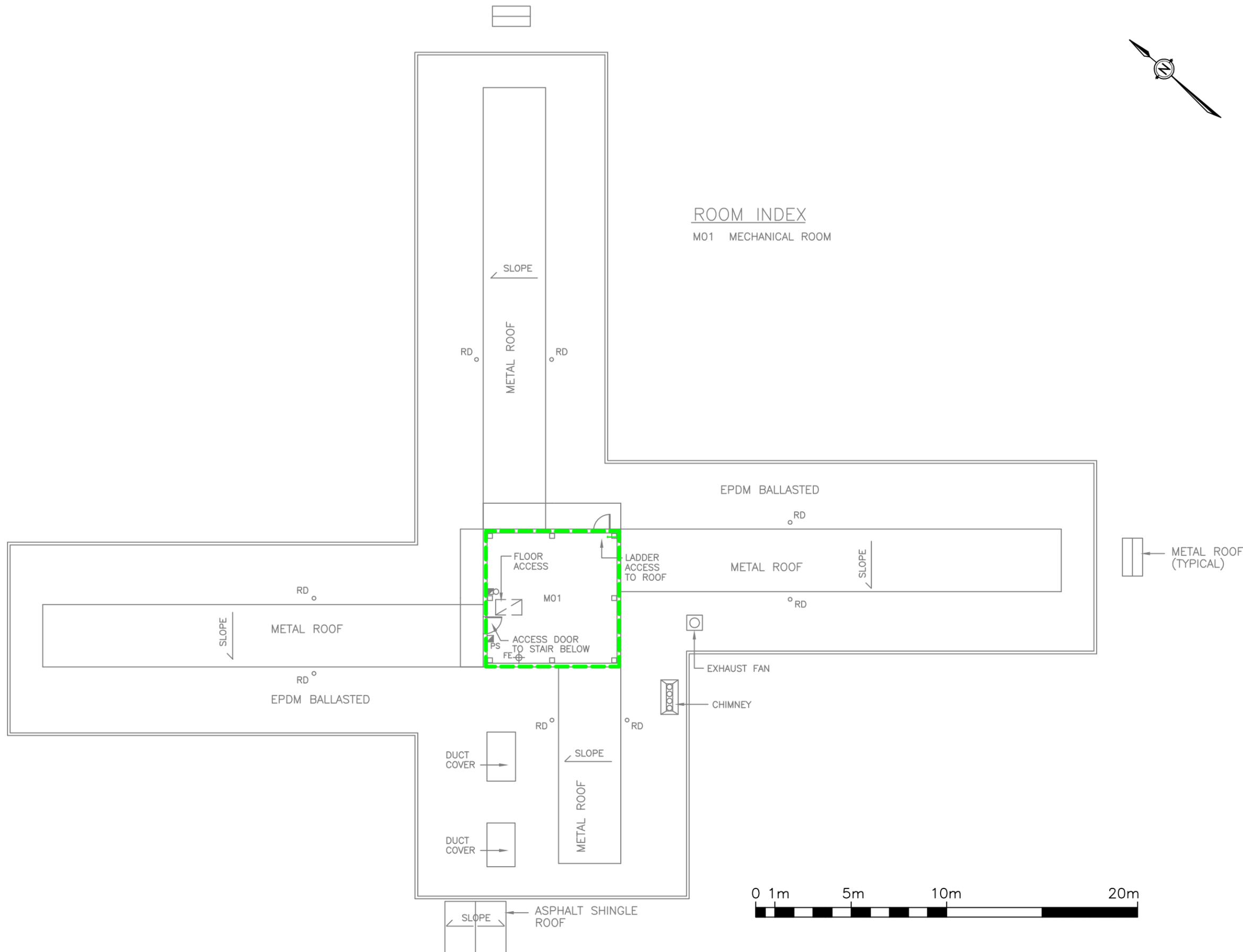
LOCATION:
**WARKWORTH INSTITUTION
 CAMPBELLFORD, ONTARIO**



DATE: 26 MAR 10 DRAWN: GGM FIGURE:
 PROJECT No: 1-336-163-01 **14**

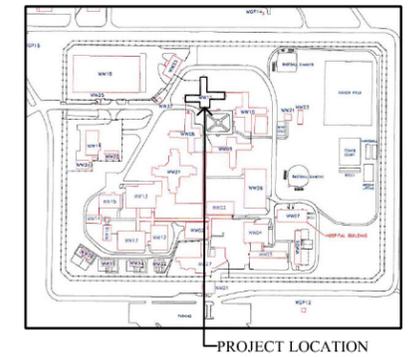
SECOND FLOOR PLAN - WW11





ROOM INDEX
M01 MECHANICAL ROOM

KEY MAP



LEGEND

- ▲ CONFIRMED LEAD PAINT SAMPLING LOCATION (>600 ppm)
- △ NON-LEAD BASED PAINT (<600 ppm)
- CONFIRMED ASBESTOS SAMPLING LOCATION
- NON-ASBESTOS CONTAINING
- ITALIC TEXT INDICATES 2005 DSHM SAMPLING*
- 25-10-PLE SAMPLE ID
- OBSERVED AREA

DRAWING REFERENCE: Base drawing supplied by PWGSC.

NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

TITLE:
**DSHMS
ACCOMMODATION (UNIT 3) WW11
SAMPLE LOCATIONS - ROOM**

LOCATION:
**WARKWORTH INSTITUTION
CAMPBELLFORD, ONTARIO**



DATE: 26 MAR 10	DRAWN: GGM	FIGURE: 15
PROJECT No: 1-336-163-01		

ROOF PLAN & MECHANICAL ROOM PLAN - WW11



APPENDIX B
LABORATORY CERTIFICATES OF ANALYSIS

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
2620 Bristol Circle, Suite 300
Oakville Ontario L6H 6Z7

Report Date: 3/25/2010
Report Number: 0310008608
Project: Lead Testing
Project No.: 1-336-161-01

LEAD PAINT SAMPLE ANALYSIS SUMMARY

<u>Lab No.</u>	<u>Client No.</u>	<u>Location / Description</u>	<u>Concentration Lead By Weight (%)</u>
3906542	WW06-115-P12	Cream Paint	0.049***

NATIONAL LEAD LABORATORY ACCREDITATION PROGRAM (NLLAP) AIHA No. 100188 / NYSDOH-ELAP No. 11021

Analysis Methods: ASTM D3335-85A "Standard Method To Test For Low Concentrations Of Lead In Paint By Atomic Absorption Spectrophotometry"
EPA SW846-(7420/7421) "Standard Method To Test For Low Concentrations Of Lead In Soils, Sludges and Sediments By AAS"

Comments: Regulatory limit is 0.5% lead by weight (EPA/HUD guidelines). Recommend multiple sampling for all samples less than regulatory limit for confirmation. All results are based on the samples as received at the lab. IATL assumes that appropriate sampling methods have been used and the data upon which these results are based have been accurately supplied by the client. Method Detection Limit (MDL) per EPA Method 40CFR Part 136 Appendix B. Reporting Limit (RL) based upon Lowest Standard Determined (LSD) in accordance with AIHA-ELLAP policies. LSD=0.2 ppm MDL=0.0024% by weight. RL= 0.010% by weight (based upon 100 mg sampled). * Insufficient sample provided to perform QC reanalysis (<200 mg) ** Not enough sample provided to analyze (<50 mg) *** Matrix / substrate interference possible. Sample results are not corrected for contamination by field or analytical blanks. This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA or any government agency. This report shall not be reproduced except in full, without written approval of the laboratory.

Date Received: 3/25/2010
Date Analyzed: 3/25/2010
Analyst: C. Shaffer

Approved By: _____
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
6 Cataragui St; Woolen Mill
Kingston Ontario K7K 1Z7

Report Date: 3/25/2010
Project:
Project No.: 1-336-161-01

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 3906617 **Description / Location:** Lt. Grey Floor Tile
Client No.: WW06-115-FT1

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
PC 6.3	Chrysotile	None Detected	None Detected	PC 93.7

Lab No.: 3906617 **Description / Location:** Black Mastic **Layer No.:** 2
Client No.: WW06-115-FT1

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	None Detected	None Detected	100

Lab No.: 3906618 **Description / Location:** Black Mastic; A/W Floor Tile
Client No.: WW06-115-FT2

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	None Detected	None Detected	100

Lab No.: 3906619 **Description / Location:** Black Mastic; A/W Floor Tile
Client No.: WW06-115-FT3

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	None Detected	None Detected	100

NIST-NVLAP No. 101165-0

NY-DOH No. 11021

AIHA Lab No. 100188

*This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA or any agency of the U.S. government
This report shall not be reproduced except in full, without written approval of the laboratory.*

Analysis Method: EPA 600/R-93/116

Comments: (PC) Indicates Stratified Point Count Method performed. Method not performed unless stated. Quantification at <0.25% by volume is possible with this method. (PC-Trace) represents this limit of quantitation. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed. Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, negative PLM results cannot be guaranteed. Electron Microscopy can be used as a confirming technique. Regulatory Limit is based upon the sample matrix

Analysis Performed By: L. Solebello

Approved By:

Date: 3/25/2010

Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
6 Cataragui St; Woolen Mill
Kingston Ontario K7K 1Z7

Report Date: 3/25/2010
Project:
Project No.: 1-336-161-01

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 3906620	Description / Location: Grey Insulation			
Client No.: WW06-114-ELB4				
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
70	Chrysotile	None Detected	None Detected	30

Lab No.: 3906621	Description / Location: Sample Not Analyzed			
Client No.: WW06-114-ELB5				
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
Sample Not Analyzed		Sample Not Analyzed		

Lab No.: 3906622	Description / Location: Sample Not Analyzed			
Client No.: WW06-114-ELB6				
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
Sample Not Analyzed		Sample Not Analyzed		

Lab No.: 3906623	Description / Location: Lt. Tan Wrap			
Client No.: WW06-114-PL7				
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	70	Cellulose	30

NIST-NVLAP No. 101165-0

NY-DOH No. 11021

AIHA Lab No. 100188

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Analysis Method: EPA 600/R-93/116

Comments: (PC) Indicates Stratified Point Count Method performed. Method not performed unless stated. Quantification at <0.25% by volume is possible with this method. (PC-Trace) represents this limit of quantitation. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed. Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, negative PLM results cannot be guaranteed. Electron Microscopy can be used as a confirming technique. Regulatory Limit is based upon the sample matrix.

Analysis Performed By: L. Solebello

Date: 3/25/2010

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
6 Cataraqui St; Woolen Mill
Kingston Ontario K7K 1Z7

Report Date: 3/25/2010
Project:
Project No.: 1-336-161-01

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 3906624 **Description / Location:** Lt. Tan Wrap
Client No.: WW06-114-PL8

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	70	Cellulose	30

Lab No.: 3906625 **Description / Location:** Tan/Yellow Wrap/Insulation
Client No.: WW06-114-PL9

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	30	Cellulose	40
		30	Fibrous Glass	

Lab No.: 3906626 **Description / Location:** Tan/Yellow Wrap/Insulation
Client No.: WW06-114-PL10

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	70	Cellulose	25
		5	Fibrous Glass	

Lab No.: 3906627 **Description / Location:** Lt. Tan Wrap
Client No.: WW06-114-PL11

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	75	Cellulose	25

NIST-NVLAP No. 101165-0

NY-DOH No. 11021

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Analysis Method: EPA 600/R-93/116

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Analysis Performed By: L. Solebello

Date: 3/25/2010

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
6 Cataraquei St; Woolen Mill
Kingston Ontario K7K 1Z7

Report Date: 3/25/2010
Project:
Project No.: 1-336-161-01

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 3906628 **Description / Location:** White/Tan Insulation

Client No.: WW06-115-P13

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	10	Fibrous Glass	90

Lab No.: 3906629 **Description / Location:** Off-White Insulation

Client No.: WW06-115-P14

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	50	Fibrous Glass	50

Lab No.: 3906630 **Description / Location:** Lt. Tan Insulation

Client No.: WW06-115-P15

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	15	Fibrous Glass	85

NIST-NVLAP No. 101165-0

NY-DOH No. 11021

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Analysis Method: EPA 600/R-93/116

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Analysis Performed By: L. Solebello

Date: 3/25/2010

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
6 Cataraqui St; Woolen Mill
Kingston Ontario K7K 1Z7

Report Date: 3/25/2010
Project:
Project No.: 1-336-161-01

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 3906631	Description / Location: Lt. Tan Floor Tile		
Client No.: WW06-115-FT16			
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>
None Detected	None Detected	None Detected	None Detected
			<u>% Non-Fibrous Material</u>
			100

Lab No.: 3906631	Description / Location: Yellow/Black Mastic			Layer No.: 2
Client No.: WW06-115-FT16				
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	None Detected	None Detected	
				100

Lab No.: 3906632	Description / Location: Lt. Tan Floor Tile		
Client No.: WW06-115-FT17			
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>
None Detected	None Detected	None Detected	None Detected
			<u>% Non-Fibrous Material</u>
			100

Lab No.: 3906632	Description / Location: Yellow/Black Mastic			Layer No.: 2
Client No.: WW06-115-FT17				
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	None Detected	None Detected	
				100

NIST-NVLAP No. 101165-0

NY-DOH No. 11021

AIHA Lab No. 100188

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Analysis Method: EPA 600/R-93/116

Comments: (PC) Indicates Stratified Point Count Method performed. Method not performed unless stated. Quantification at <0.25% by volume is possible with this method. (PC-Trace) represents this limit of quantitation. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed. Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, negative PLM results cannot be guaranteed. Electron Microscopy can be used as a confirming technique. Regulatory Limit is based upon the sample matrix

Analysis Performed By: L. Solebello

Date: 3/25/2010

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
6 Cataragui St; Woolen Mill
Kingston Ontario K7K 1Z7

Report Date: 3/25/2010
Project:
Project No.: 1-336-161-01

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 3906633	Description / Location: Lt. Tan Floor Tile			
Client No.: WW06-115-FT18				
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	None Detected	None Detected	100

Lab No.: 3906633	Description / Location: Yellow Mastic			Layer No.: 2
Client No.: WW06-115-FT18				
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	None Detected	None Detected	100

Lab No.: 3906634	Description / Location: Grey/Yellow Insulation			
Client No.: WW05-109-ELB19				
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
70	Chrysotile	5	Fibrous Glass	25

Lab No.: 3906635	Description / Location: Sample Not Analyzed			
Client No.: WW05-109-ELB20				
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
Sample Not Analyzed		Sample Not Analyzed		

NIST-NVLAP No. 101165-0

NY-DOH No. 11021

AIHA Lab No. 100188

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Analysis Method: EPA 600/R-93/116

Comments: (PC) Indicates Stratified Point Count Method performed. Method not performed unless stated. Quantification at <0.25% by volume is possible with this method. (PC-Trace) represents this limit of quantitation. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed. Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, negative PLM results cannot be guaranteed. Electron Microscopy can be used as a confirming technique. Regulatory Limit is based upon the sample matrix.

Analysis Performed By: L. Solebello

Date: 3/25/2010

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
6 Cataraqui St; Woolen Mill
Kingston Ontario K7K 1Z7

Report Date: 3/25/2010
Project:
Project No.: 1-336-161-01

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 3906636 **Description / Location:** Sample Not Analyzed

Client No.: WW05-109-ELB21

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
Sample Not Analyzed		Sample Not Analyzed		

Lab No.: 3906637 **Description / Location:** Tan Wrap

Client No.: WW05-109-PL22

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	80	Cellulose	20

Lab No.: 3906638 **Description / Location:** Tan Wrap

Client No.: WW05-109-PL23

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	80	Cellulose	20

Lab No.: 3906639 **Description / Location:** Tan Wrap/Insulation

Client No.: WW05-109-PL24

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	80	Cellulose	20

NIST-NVLAP No. 101165-0

NY-DOH No. 11021

AIHA Lab No. 100188

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Analysis Method: EPA 600/R-93/116

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Analysis Performed By: L. Solebello

Date: 3/25/2010

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
6 Cataraqi St; Woolen Mill
Kingston Ontario K7K 1Z7

Report Date: 3/25/2010
Project:
Project No.: 1-336-161-01

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 3906640 **Description / Location:** White/Tan Wrap/Insulation
Client No.: WW09-B01-PL25

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	80	Cellulose	20

Lab No.: 3906641 **Description / Location:** White/Tan Wrap/Insulation
Client No.: WW09-B01-PL26

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	80	Cellulose	20

Lab No.: 3906642 **Description / Location:** White/Tan Wrap/Insulation
Client No.: WW09-B01-PL27

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	80	Cellulose	20

Lab No.: 3906643 **Description / Location:** White/Tan Wrap/Insulation
Client No.: WW09-B01-PL28

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	50	Cellulose	30
		20	Fibrous Glass	

NIST-NVLAP No. 101165-0

NY-DOH No. 11021

AIHA Lab No. 100188

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Analysis Method: EPA 600/R-93/116

Comments: (PC) Indicates Stratified Point Count Method performed. Method not performed unless stated. Quantification at <0.25% by volume is possible with this method. (PC-Trace) represents this limit of quantitation. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed. Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, negative PLM results cannot be guaranteed. Electron Microscopy can be used as a confirming technique. Regulatory Limit is based upon the sample matrix.

Analysis Performed By: L. Solebello

Date: 3/25/2010

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
6 Cataraqui St; Woolen Mill
Kingston Ontario K7K 1Z7

Report Date: 3/25/2010
Project:
Project No.: 1-336-161-01

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 3906644 Description / Location: White/Tan/Yellow Wrap/Insulation
Client No.: WW09-B01-PL29

% Asbestos	Type	% Non-Asbestos Fibrous Material	Type	% Non-Fibrous Material
None Detected	None Detected	70	Cellulose	20
		10	Fibrous Glass	

Lab No.: 3906645 Description / Location: Tan/Black Insulation
Client No.: WW09-B01-PW30

% Asbestos	Type	% Non-Asbestos Fibrous Material	Type	% Non-Fibrous Material
None Detected	None Detected	90	Cellulose	10

Lab No.: 3906646 Description / Location: Tan/Black Insulation
Client No.: WW09-B01-PW31

% Asbestos	Type	% Non-Asbestos Fibrous Material	Type	% Non-Fibrous Material
None Detected	None Detected	85	Cellulose	15

Lab No.: 3906647 Description / Location: Black/Tan Insulation
Client No.: WW09-B01-PW32

% Asbestos	Type	% Non-Asbestos Fibrous Material	Type	% Non-Fibrous Material
None Detected	None Detected	80	Cellulose	20

NIST-NVLAP No. 101165-0

NY-DOH No. 11021

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Analysis Method: EPA 600/R-93/116

Comments: (PC) Indicates Stratified Point Count Method performed. Method not performed unless stated. Quantification at <0.25% by volume is possible with this method. (PC-Trace) represents this limit of quantitation. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed. Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, negative PLM results cannot be guaranteed. Electron Microscopy can be used as a confirming technique. Regulatory Limit is based upon the sample matrix.

Analysis Performed By: L. Solebello

Date: 3/25/2010

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
6 Cataraqui St; Woolen Mill
Kingston Ontario K7K 1Z7

Report Date: 3/25/2010
Project:
Project No.: 1-336-161-01

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 3906648 **Description / Location:** Grey Transite
Client No.: WW09-B01-FD33

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
10	Chrysotile	None Detected	None Detected	85
5.0	Crocidolite			

Lab No.: 3906649 **Description / Location:** Sample Not Analyzed
Client No.: WW09-B01-FD34

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
Sample Not Analyzed		Sample Not Analyzed		

Lab No.: 3906650 **Description / Location:** Sample Not Analyzed
Client No.: WW09-B01-FD35

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
Sample Not Analyzed		Sample Not Analyzed		

Lab No.: 3906651 **Description / Location:** White/Tan Wrap/Insulation
Client No.: WW11-PL-36

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	85	Cellulose	15

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Analysis Method: EPA 600/R-93/116

Comments: (PC) Indicates Stratified Point Count Method performed. Method not performed unless stated. Quantification at <0.25% by volume is possible with this method. (PC-Trace) represents this limit of quantitation. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed. Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, negative PLM results cannot be guaranteed. Electron Microscopy can be used as a confirming technique. Regulatory Limit is based upon the sample matrix.

Analysis Performed By: L. Solebello

Date: 3/25/2010

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
6 Cataract St; Woolen Mill
Kingston Ontario K7K 1Z7

Report Date: 3/25/2010
Project:
Project No.: 1-336-161-01

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 3906652 **Description / Location:** White Wrap
Client No.: WW11-PL-37

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	45	Cellulose	50
		5	Wollastonite	

Lab No.: 3906653 **Description / Location:** White/Tan Wrap/Insulation
Client No.: WW11-PL-38

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	60	Cellulose	40
		Trace	Wollastonite	

Lab No.: 3906654 **Description / Location:** Grey Cementitious
Client No.: WW08-FD-39

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	None Detected	None Detected	100

Lab No.: 3906655 **Description / Location:** Grey Transite
Client No.: WW08-FD-40

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
10	Chrysotile	None Detected	None Detected	85
5.0	Crocidolite			

NIST-NVLAP No. 101165-0

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Analysis Method: EPA 600/R-93/116

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Analysis Performed By: L. Solebello

Date: 3/25/2010

CERTIFICATE OF ANALYSIS

Client: XCG Consultants Ltd.
6 Cataragui St; Woolen Mill
Kingston Ontario K7K 1Z7

Report Date: 3/25/2010
Project:
Project No.: 1-336-161-01

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 3906656 **Description / Location:** Sample Not Analyzed
Client No.: WW08-FD-41

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
Sample Not Analyzed		Sample Not Analyzed		

Lab No.: 3906657 **Description / Location:** White/Tan Wrap/Insulation
Client No.: WW11-PL-38a

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	85	Cellulose	15

Lab No.: 3906658 **Description / Location:** White Wrap
Client No.: WW11-PL-38b

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	45	Cellulose	50
		5	Wollastonite	

Lab No.: 3906659 **Description / Location:** Brown/Black Insulation
Client No.: WW09-B01-PW30a

<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	85	Cellulose	15

NIST-NVLAP No. 101165-0

NY-DOH No. 11021

AIHA Lab No. 100188

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Analysis Method: EPA 600/R-93/116

Comments: (PC) Indicates Stratified Point Count Method performed. Method not performed unless stated. Quantification at <0.25% by volume is possible with this method. (PC-Trace) represents this limit of quantitation. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed. Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, negative PLM results cannot be guaranteed. Electron Microscopy can be used as a confirming technique. Regulatory Limit is based upon the sample matrix.

Analysis Performed By: L. Solebello

Date: 3/25/2010



APPENDIX C
SITE PHOTOGRAPHS



Photo 1: Typical vertical pipe chase with fiberglass pipe insulation.



Photo 2: Building WW06 Room 114 mould on HVAC jacketing.



Photo 3: Building WW06 Room 114 Damaged asbestos-containing insulation.



Photo 4: Example of fiberglass piping insulation and asbestos containing pipe elbow insulation in 'good condition' typical of the area above the ranges and in the mechanical rooms.



Photo 5: Asbestos-containing fire damper gasket (buildings WW08, WW09, WW10, WW11)



Photo 6: Typical attic space above ranges (buildings WW08, WW09, WW10, WW11)