



August 25, 2017

## CITY OF SASKATOON

# Asbestos-Containing Building Materials Assessment Report - North Central Substation/Electrical Transformer Building



**Submitted to:**

The City of Saskatoon  
1101 Avenue P North  
Saskatoon, SK S7L 7K6

**Report Number: 1667963**

**Distribution:**

One Copy: City of Saskatoon  
One Copy: Golder Associates Ltd.

REPORT





---

# ASBESTOS-CONTAINING BUILDING MATERIALS ASSESSMENT REPORT - NORTH CENTRAL SUBSTATION/ELECTRICAL TRANSFORMER BUILDING

---

## Table of Contents

<b>1.0 INTRODUCTION.....</b>	<b>1</b>
<b>2.0 SCOPE OF WORK .....</b>	<b>1</b>
2.1 Asbestos-Containing Materials .....	1
<b>3.0 RESULTS AND DISCUSSION .....</b>	<b>2</b>
3.1 Asbestos-Containing Materials .....	2
3.1.1 List of Identified Asbestos-Containing Materials .....	2
3.1.2 Non Asbestos-Containing Materials .....	2
<b>4.0 EXCLUDED AREAS AND MATERIALS .....</b>	<b>3</b>
<b>5.0 CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>3</b>
5.1 Asbestos-Containing Materials .....	3
<b>6.0 SURVEY LIMITATIONS.....</b>	<b>4</b>
<b>7.0 CLOSURE.....</b>	<b>5</b>

### APPENDICES

#### APPENDIX A

Laboratory Certificate of Analysis Report

#### APPENDIX B

Site Photographs

#### APPENDIX C

Room by Room Spreadsheet

#### APPENDIX D

Floor Plans



# ASBESTOS-CONTAINING BUILDING MATERIALS ASSESSMENT REPORT - NORTH CENTRAL SUBSTATION/ELECTRICAL TRANSFORMER BUILDING

## 1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by the City of Saskatoon (the Client) to conduct an asbestos-containing building materials assessment of the North Central Substation/Electrical Transformer Building (the Site) located at 801 – 1<sup>st</sup> Avenue in Saskatoon, Saskatchewan. This assessment report details our findings, conclusions and recommendations for the Site. A walkthrough of the Site was conducted on June 12, 2017 and the assessment was conducted on June 19, 2017 by Kody Henderson, OHS Project Manager. Asbestos-containing building materials were identified within the North Central Substation/Electrical Transformer Building during the assessment. Further information is provided in Section 3.0.

## 2.0 SCOPE OF WORK

In accordance with Tender 16-0844, Golder's scope of work included conducting an asbestos-containing building materials assessment of the Site to evaluate the quantities, locations, and conditions of asbestos-containing building materials.

Following the field work, Golder prepared this assessment report that includes laboratory analysis results, findings of the assessment, conclusions, and recommendations.

### 2.1 Asbestos-Containing Materials

The assessment involved a non-destructive inspection of the Site to assess the type and extent of suspect ACMs in the facility. The systems that were reviewed as part of the inspections included, but were not limited to:

- *Structural* - systems including: insulation between solid webbed joists, fireproofing, building envelope, and interior/exterior caulking around windows and doors;
- *Mechanical* - systems insulation including: hot water and steam system, condensate system, chilled water system, glycol system, domestic hot and cold water, emergency generator exhaust, boiler units, heat exchangers, and asbestos cement piping; and
- *Architectural* - systems including: texture coats, sheet flooring, vinyl floor tile, acoustical spray-applied materials, condensation control applications, ceiling tile, wall board, drywall joint compound, and asbestos sheet products.

Systematic sampling of suspect ACMs was conducted as part of the assessment. Samples were submitted under chain of custody to International Asbestos Testing Laboratory Inc. (IATL) and analyzed for asbestos type and percentage content using Polarized Light Microscopy (PLM) in accordance with EPA methodologies (EPA 600/R-93/116).

Further information related to the assessment and sample collection methods can be found in the Golder document *Golder Asbestos Assessment General Survey Plan and Protocol* provided to the Client.



---

## ASBESTOS-CONTAINING BUILDING MATERIALS ASSESSMENT REPORT - NORTH CENTRAL SUBSTATION/ELECTRICAL TRANSFORMER BUILDING

---

### 3.0 RESULTS AND DISCUSSION

The North Central Substation/Electrical Transformer Building consists of three large open areas, washrooms, and an office space and was constructed in 1960/1998. During the assessment, the substation portion of the building was treated as one functional space and the office space was treated as a second functional space.

- The Laboratory Certificate of Analysis report for the bulk asbestos samples is included in Appendix A.
- Photographs collected during the assessment are provided in Appendix B.
- A room by room spreadsheet outlining the locations, quantities, friability, and condition of identified asbestos-containing materials as well as additional information is provided in Appendix C.
- Floor plans outlining the sample locations and locations of identified asbestos-containing materials are provided in Appendix D.
- Please refer to Sections 4.0 and 6.0 of this report for a summary of the limitations encountered.

### 3.1 Asbestos-Containing Materials

A total of nineteen (19) samples of building materials were collected and tested for asbestos content during the assessment of the North Central Substation/Electrical Transformer Building. One (1) of the samples was found to contain asbestos.

Potential asbestos-containing materials and components may be located within the electrical panels and fire doors on Site.

#### 3.1.1 List of Identified Asbestos-Containing Materials

A list of the identified asbestos-containing materials is provided below.

- 1'x1' Off-White Floor Tile with Black Flecks.

Further information on the identified asbestos-containing materials listed is provided below.

##### ***1'x1' Off-White Floor Tile with Black Flecks***

One (1) sample of 1'x1' off-white floor tile with black flecks was collected during the assessment. The sample collected was found to contain trace Chrysotile asbestos. Asbestos-containing 1'x1' off-white floor tile with black flecks (see Photograph 1 in Appendix B) was observed in the following locations:

- Room 106 (approximately 50 ft<sup>2</sup>).

Additional asbestos-containing 1'x1' off-white floor tile with black flecks may be located below the carpeting within select rooms of the office area portion of the Site.

#### 3.1.2 Non Asbestos-Containing Materials

The following materials were sampled during this assessment and were found to not contain asbestos or were observed to be non-suspect materials:

- Drywall joint compound;
- Black window caulking;



## **ASBESTOS-CONTAINING BUILDING MATERIALS ASSESSMENT REPORT - NORTH CENTRAL SUBSTATION/ELECTRICAL TRANSFORMER BUILDING**

- White building caulking;
- White sink undercoat;
- White duct mastic;
- 1'x1' Ceiling tile with pinholes; and
- The 2'x4' ceiling tile with small pinholes and small divots were date coded to a time period in which asbestos use was not widespread.

Please note that the cast iron joint packing throughout the site was found to be packed with bulk lead and is not suspected to contain asbestos.

### **4.0 EXCLUDED AREAS AND MATERIALS**

The following is a list of the areas and/or materials excluded during the assessment.

- Building materials accessible by a ten foot ladder were assessed by Golder during the assessment. Materials located at heights that were inaccessible from a ten foot ladder were not assessed. If materials at heights are to be removed or impacted by future renovation or demolition activities, additional investigation and sampling of suspect materials may be required.
- The roof and associated components were not assessed by Golder during the assessment as per Tender 16-0844. If the roof and associated components are to be removed or impacted by future renovation or demolition activities, additional investigation and sampling of suspect materials may be required.
- The electrical panels and associated components were not inspected by Golder during the assessment. If the panels are to be removed or impacted by future renovation or demolition activities, additional investigation and sampling of suspect materials may be required.

### **5.0 CONCLUSIONS AND RECOMMENDATIONS**

Based on the visual assessment and the laboratory analytical results, the following project specific conclusions and recommendations are provided.

#### **5.1 Asbestos-Containing Materials**

Asbestos was positively identified within the 1'x1' off-white floor tile with black flecks on Site. Asbestos was not identified in the remaining samples collected and analyzed.

If the building is scheduled for renovations that will impact the identified asbestos-containing materials, it must be removed. If additional suspect asbestos-containing building materials are encountered during renovation activities, additional sampling should be undertaken to evaluate asbestos content.

Removal work should be completed by workers that are adequately trained in the hazards and proper methods of working with asbestos. Throughout the abatement activities, appropriate air monitoring and inspections should be conducted by a competent person to document that contamination is contained and that ACM are disposed of appropriately. Ensure asbestos waste is disposed of in accordance with the requirements of the Government of Saskatchewan.



## ASBESTOS-CONTAINING BUILDING MATERIALS ASSESSMENT REPORT - NORTH CENTRAL SUBSTATION/ELECTRICAL TRANSFORMER BUILDING

All quantities listed in the report are approximate and are based on the conditions at the time of the assessment. Prior to abatement work it is recommended that a competent person conduct a review of the site to quantify and obtain all measurements of all building materials detailed in this report for cost estimating purposes.

In anticipation of potential abatement, Golder's recommendations for the asbestos-containing materials identified during the assessment are outlined below.

### **1'x1' Off-White Floor Tile with Black Flecks**

If scheduled for impact, asbestos-containing 1'x1' off-white floor tile with black flecks should be abated following low-risk abatement work procedures as outlined in the *Saskatchewan Asbestos Abatement Manual* (2017). Alternatively, as the 1'x1' off-white floor tiles with black flecks were observed in good condition, and with a priority rating of 5 (please see the room by room spreadsheet provided in Appendix C for a description of the priority ratings), the tiles can be managed in place if not scheduled for impact.

## **6.0 SURVEY LIMITATIONS**

This report is based on data and information collected by Golder during the assessment conducted on June 19, 2017 and is based solely on site conditions encountered at the time of the assessment. Any use of this document or the findings, conclusions or recommendations provided in this report by any person other than the City of Saskatoon is at the sole risk of such user.

The conclusions and recommendations contained in this survey report are based upon professional opinions with regard to the subject matter. These opinions are in accordance with currently accepted environmental assessment standards and practices applicable to these locations and are subject to the following inherent limitations:

The data and findings presented in this report are valid as of the dates of the investigations. The passage of time, manifestation of latent conditions or occurrence of future events may warrant further exploration at the properties, analysis of the data, and re-evaluation of the findings, observations, and conclusions expressed in this report. No assurance is made regarding changes in conditions or practices subsequent to the time of the investigation. It was beyond the scope of this assessment to conduct a risk assessment and the potential health risks that may be associated with asbestos exposure for building occupants.

The data reported and the findings, observations and conclusions expressed in this report are limited by the Scope of Work. The Scope of Work was defined by Tender 16-0844 and the initial site walkthrough with the Client, the time and budgetary constraints imposed by the Client, and availability of access to the property.

Because of the limitations stated above, the findings, observations and conclusions expressed by Golder in this report are not, and must not be, considered an opinion concerning compliance of any past or present owner or operator of the site with any federal, provincial or local laws or regulations.

No warranty or guarantee, whether expressed or implied, is made with respect to the data or the reported findings, observations, and conclusions, which are based solely upon site conditions in existence at the time of investigation.

Golder's assessment reports present professional opinions and findings of a scientific and technical nature. While attempts were made to relate the data and findings to applicable environmental laws and regulations, the report shall not be construed to offer legal opinion or representations as to the requirements of, nor compliance



---

## ASBESTOS-CONTAINING BUILDING MATERIALS ASSESSMENT REPORT - NORTH CENTRAL SUBSTATION/ELECTRICAL TRANSFORMER BUILDING

---

with, environmental laws, rules, regulations or policies of federal, provincial, or local governmental agencies. Any use of the survey report constitutes acceptance of the limits of Golder's liability.

Golder's liability extends only to its client and not to other parties who may obtain this survey report. Issues raised by the report must be reviewed by appropriate legal counsel.

### 7.0 CLOSURE

We trust the information presented in this report meets your requirements. If you have any questions please contact Kody Henderson at (780) 483-3499 or email at [kody\\_henderson@golder.com](mailto:kody_henderson@golder.com). Thank you for the opportunity to be of service. We look forward to working with you again in the future.



## ASBESTOS-CONTAINING BUILDING MATERIALS ASSESSMENT REPORT - NORTH CENTRAL SUBSTATION/ELECTRICAL TRANSFORMER BUILDING

### Report Signature Page

#### GOLDER ASSOCIATES LTD.

Prepared by:

Kody Henderson, Dipl. Env. Sci., CRSP  
OHS Project Manager

Reviewed by:

Andrew Grant, B.Sc., P.Eng., EP, CRSP  
Associate, OHS Project Director

KH/AG/ba

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation.

n:\active\2016\3 proj\1667963 cityofsaskatoon\_asbsurveys\_saskatoon\07 reports\34 - north central substation\city of saskatoon - north central substation - asbestos building material assessment report.docx





# **APPENDIX A**

## **Laboratory Certificate of Analysis Report**


## CERTIFICATE OF ANALYSIS

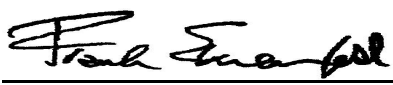
<b>Client:</b> Golder Associates Ltd 16820 107 Ave Edmonton AB T5P 4C3	<b>Report Date:</b> 7/3/2017 <b>Report No.:</b> 539902 - PLM <b>Project:</b> City of Saskatoon - North Central Substation <b>Project No.:</b> 1667963
<b>Client:</b> GOL572	

### PLM BULK SAMPLE ANALYSIS SUMMARY

<b>Lab No.:</b> 6271156 <b>Client No.:</b> A-001 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> White Joint Compound <b>Client Description:</b> Drywall Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Room 107 <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100
<b>Lab No.:</b> 6271157 <b>Client No.:</b> A-002 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> White Joint Compound <b>Client Description:</b> Drywall Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Room 107 <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100
<b>Lab No.:</b> 6271158 <b>Client No.:</b> A-003 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> Tan/White Sheetrock <b>Client Description:</b> Drywall Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> 10 Cellulose Trace Fibrous Glass	<b>Location:</b> Room 111 <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 90
<b>Lab No.:</b> 6271159 <b>Client No.:</b> A-004 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> White Joint Compound <b>Client Description:</b> Drywall Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Room 111 <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100
<b>Lab No.:</b> 6271160 <b>Client No.:</b> A-005 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> White Joint Compound <b>Client Description:</b> Drywall Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Room 109 <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100
<b>Lab No.:</b> 6271161 <b>Client No.:</b> A-006 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> White Joint Compound <b>Client Description:</b> Drywall Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Room 108/110 <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100
<b>Lab No.:</b> 6271162 <b>Client No.:</b> A-007 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> White Joint Compound <b>Client Description:</b> Drywall Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Room 108/110 <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100

Analytical Method -US EPA 600, R93-116. Please refer to the Appendix of this report for further information regarding your analysis.

**Date Received:** 6/26/2017  
**Date Analyzed:** 07/03/2017  
**Signature:**   
**Analyst:** Muhammad Mirza

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


## CERTIFICATE OF ANALYSIS

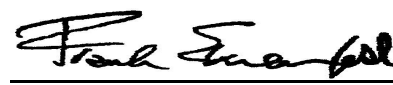
<b>Client:</b> Golder Associates Ltd 16820 107 Ave Edmonton AB T5P 4C3	<b>Report Date:</b> 7/3/2017 <b>Report No.:</b> 539902 - PLM <b>Project:</b> City of Saskatoon - North Central Substation <b>Project No.:</b> 1667963
<b>Client:</b> GOL572	

### PLM BULK SAMPLE ANALYSIS SUMMARY

<b>Lab No.:</b> 6271163 <b>Client No.:</b> A-008 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> Black Caulk <b>Client Description:</b> Black Window Caulking <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Room 107 <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100
<b>Lab No.:</b> 6271164 <b>Client No.:</b> A-009 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> White Caulk <b>Client Description:</b> White Building Caulking <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Exterior <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100
<b>Lab No.:</b> 6271165 <b>Client No.:</b> A-010 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> Black Caulk <b>Client Description:</b> Black Window Caulking <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Exterior <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100
<b>Lab No.:</b> 6271166 <b>Client No.:</b> A-011 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> White Joint Compound <b>Client Description:</b> Drywall Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Room 101/102 <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100
<b>Lab No.:</b> 6271167 <b>Client No.:</b> A-012 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> White Joint Compound <b>Client Description:</b> Drywall Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Room 101/102 <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100
<b>Lab No.:</b> 6271168 <b>Client No.:</b> A-013 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> White Joint Compound <b>Client Description:</b> Drywall Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Room 106 <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100
<b>Lab No.:</b> 6271169 <b>Client No.:</b> A-014 <u>Percent Asbestos:</u> <i>None Detected</i>	<b>Analyst Observation:</b> White Joint Compound <b>Client Description:</b> Drywall Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<b>Location:</b> Room G-1 <b>Facility:</b> <u>Percent Non-Fibrous Material:</u> 100

Analytical Method -US EPA 600, R93-116. Please refer to the Appendix of this report for further information regarding your analysis.

**Date Received:** 6/26/2017  
**Date Analyzed:** 07/03/2017  
**Signature:**   
**Analyst:** Muhammad Mirza

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

## CERTIFICATE OF ANALYSIS

**Client:** Golder Associates Ltd  
16820 107 Ave  
Edmonton AB T5P 4C3

**Report Date:** 7/3/2017  
**Report No.:** 539902 - PLM  
**Project:** City of Saskatoon - North Central Substation  
**Project No.:** 1667963

**Client:** GOL572

### PLM BULK SAMPLE ANALYSIS SUMMARY

**Lab No.:** 6271170  
**Client No.:** A-015

**Analyst Observation:** Tan Joint Compound  
**Client Description:** Drywall Joint Compound

**Location:** Room 105  
**Facility:**

Percent Asbestos:  
*None Detected*

Percent Non-Asbestos Fibrous Material:  
None Detected

Percent Non-Fibrous Material:  
100

**Lab No.:** 6271171  
**Client No.:** A-016

**Analyst Observation:** Grey Insulation  
**Client Description:** White Sink Undercoat

**Location:** Room 101/102  
**Facility:**

Percent Asbestos:  
*None Detected*

Percent Non-Asbestos Fibrous Material:  
None Detected

Percent Non-Fibrous Material:  
100

**Lab No.:** 6271172  
**Client No.:** A-017

**Analyst Observation:** White Floor Tile; 12x12  
**Client Description:** 12x12 Off-White Floor Tile With Black  
Flecks

**Location:** Room 106  
**Facility:**

Percent Asbestos:  
*PC Trace Chrysotile*

Percent Non-Asbestos Fibrous Material:  
None Detected

Percent Non-Fibrous Material:  
100

**Lab No.:** 6271173  
**Client No.:** A-018

**Analyst Observation:** White Thick Paint  
**Client Description:** White Duct Mastic

**Location:** Room G-1  
**Facility:**

Percent Asbestos:  
*None Detected*

Percent Non-Asbestos Fibrous Material:  
None Detected

Percent Non-Fibrous Material:  
100

**Lab No.:** 6271174  
**Client No.:** A-019

**Analyst Observation:** White/Tan Ceiling Tile  
**Client Description:** 1x1 Ceiling Tile With Pinholes

**Location:** Room 101/102  
**Facility:**

Percent Asbestos:  
*None Detected*

Percent Non-Asbestos Fibrous Material:  
98 Cellulose

Percent Non-Fibrous Material:  
2

Analytical Method -US EPA 600, R93-116. Please refer to the Appendix of this report for further information regarding your analysis.

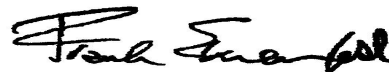
**Date Received:** 6/26/2017

**Date Analyzed:** 07/03/2017

**Signature:**

**Analyst:** Muhammad Mirza

**Approved By:**



Frank E. Ehrenfeld, III  
Laboratory Director

## CERTIFICATE OF ANALYSIS

**Client:** Golder Associates Ltd  
16820 107 Ave  
Edmonton AB T5P 4C3

**Report Date:** 7/3/2017  
**Report No.:** 539902 - PLM  
**Project:** City of Saskatoon - North Central Substation  
**Project No.:** 1667963

**Client:** GOL572

### Appendix to Analytical Report

**Customer Contact:**

**Analysis:** US EPA 600, R93-116

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

**iATL Customer Service:** customerservice@iatl.com

**iATL Office Manager:** cdavis@iatl.com

**iATL Account Representative:** Pete Lesniak

**Sample Login Notes:** See Batch Sheet Attached

**Sample Matrix:** Bulk Building Materials

**Exceptions Noted:** See Following Pages

#### General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at [www.iATL.com](http://www.iATL.com) and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA LAP LLC, or any agency of local, state or province governments nor of any agency of the U.S. government.

This report shall not be reproduced except in full, without written approval of the laboratory.

#### Information Pertinent to this Report:

Analysis by US EPA 600 93-116: Determination of Asbestos in Bulk Building Materials by Polarized Light Microscopy (PLM).

#### Certifications:

- NIST-NVLAP No. 101165-0
- NY-DOH No. 11021
- AIHA-LAP, LLC No. 100188

Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (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 (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analytical Methodology Alternatives: Your initial request for analysis may not have accounted for recent advances in regulatory requirements or advances in technology that are routinely used in similar situations for other qualified projects. You may have the option to explore additional analysis for further information. Below are a few options, listed as the matrix followed by the appropriate methodology. Also included are links to more information on our website.

Bulk Building Materials that are Non-Friable Organically Bound (NOB) by Gravimetric Reduction techniques employing PLM and TEM: ELAP 198.6 (PLM-NOB), ELAP 198.4 (TEM-NOB)

Loose Fill Vermiculite Insulation, Attic Insulation, Zonolite (copyright), etc.: US EPA 600 R-4/004 (multi-tiered analytical process)  
Sprayed On Insulation/Fireproofing with Vermiculite (SOF-V): ELAP 198.8 (PLM-SOF-V)>

Soil, sludge, sediment, aggregate, and like materials analyzed for asbestos or other elongated mineral particles (ex. erionite, etc.): ASTM D7521, CARB 435, and other options available

## CERTIFICATE OF ANALYSIS

**Client:** Golder Associates Ltd  
16820 107 Ave  
Edmonton AB T5P 4C3

**Report Date:** 7/3/2017  
**Report No.:** 539902 - PLM  
**Project:** City of Saskatoon - North Central Substation  
**Project No.:** 1667963

**Client:** GOL572

Asbestos in Surface Dust according to one of ASTM's Methods (very dependent on sampling collection technique – by TEM): ASTM D 5755, D5756, or D6480

Various other asbestos matrices (air, water, etc.) and analytical methods are available.

### Disclaimers / Qualifiers:

There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a list with highlighted disclaimers that may be pertinent to this project. For a full explanation of these and other disclaimers, please inquire at [customerservice@iatl.com](mailto:customerservice@iatl.com).

- 1) Note: No mastic provided for analysis.
- 2) Note: Insufficient mastic provided for analysis.
- 3) Note: Insufficient material provided for analysis.
- 4) Note: Insufficient sample provided for QC reanalysis.
- 5) Note: Different material than indicated on Sample Log / Description.
- 6) Note: Sample not submitted.
- 7) Note: Attached to asbestos containing material.
- 8) Note: Received wet.
- 9) Note: Possible surface contamination.
- 10) Note: Not building material. 1% threshold may not apply.
- 11) Note: Recommend TEM-NOB analysis as per EPA recommendations.
- 12) Note: Asbestos detected but not quantifiable.
- 13) Note: Multiple identical samples submitted, only one analyzed.
- 14) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.080%.
- 15) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.125%.

### Recommendations for Vermiculite Analysis:

Several analytical protocols exist for the analysis of asbestos in vermiculite. These analytical approaches vary depending upon the nature of the vermiculite mineral being tested (e.g. un-processed gangue, homogeneous exfoliated books of mica, or mixed mineral composites). Please contact your client representative for pricing and turnaround time options available.

iATL recommends initial testing using the EPA 600/R-93/116 method. This method is specifically designed for the analysis of asbestos in bulk building materials. It provides an acceptable starting point for primary screening of vermiculite for possible asbestos.

Results from this testing may be inconclusive. EPA suggests proceeding to a multi-tiered analysis involving wet separation techniques in conjunction with PLM and TEM gravimetric analysis (EPA 600/R-04/004).

Further information on this method and other vermiculite and asbestos issues can be found at the following: Agency for Toxic Substances and Disease Registry (ATSDR) [www.atsdr.cdc.gov](http://www.atsdr.cdc.gov), United States Geological Survey (USGS) [www.minerals.usgs.gov/minerals/](http://www.minerals.usgs.gov/minerals/), US EPA [www.epa.gov/asbestos](http://www.epa.gov/asbestos). The USEPA also has an informative brochure "Current Best Practices for Vermiculite Attic Insulation" EPA 747F03001 May 2003, that may assist the health and remediation professional.

The following is a summary of the analytical process outlines in the EPA 600/R-04/004 Method:

- 1) **Analytical Step/Method:** Initial Screening by PLM, EPA 600R-93/116  
**Requirements/Comments:** Minimum of 0.1 g of sample. ~0.25% LOQ for most samples.
- 2) **Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004  
**Requirements/Comments:** Minimum 50g\*\* of dry sample. Analysis of "Sinks" only.
- 3) **Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004  
**Requirements/Comments:** Minimum 50g\*\* of dry sample. Analysis of "Floats" only.
- 4) **Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004  
**Requirements/Comments:** Minimum 50g\*\* of dry sample. Analysis of "Sinks" only.
- 5) **Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004  
**Requirements/Comments:** Minimum 50g\*\* of dry sample. Analysis of "Suspension" only.

LOQ, Limit of Quantitation estimates for mass and volume analyses.

\*With advance notice and confirmation by the laboratory.

\*\*Approximately 1 Liter of sample in double-bagged container (~9x6 inch bag of sample).



# **APPENDIX B**

## **Site Photographs**





## APPENDIX B

### Site Photographs



**Photograph 1: Asbestos-Containing 1'x1' Off-White Floor Tile with Black Flecks.**

n:\active\2016\3 proj\1667963 cityofsaskatoon\_asbsurveys\_saskatoon\07 reports\34 - north central substation\appendix b - site photographs.docx





# **APPENDIX C**

## **Room by Room Spreadsheet**

North Central Substation/Electrical Transformer Building  
ACM Inventory

Included/ Excluded	Floor	Room #	Area Description	Elements	Subelements	Material Description	Accessibility	Suspect?	Sampled?	Asbestos Containing Material?	Condition	Field Notes	Sample Type	Sample ID	Sample Date	Asbestos Type	ACM Product	% of asbestos	Friable	Sprayed-on	Maintenance	Inspection	Priority	Potential for Disturbance	Recommended Action	Quantity	Photograph ID	Labelling Type
Included	All	Throughout	All	Doors	Regular Door	Non Suspect Door	High	No	No	No	Good	Non-suspect doors were observed throughout the Site.																
Included	M	101/102	General Room	Walls	Walls	Drywall Joint Compound	High	No	Yes	No	Good		Bulk	A-011, A-012	19-Jun-17													
Included	M	101/102	General Room	Walls	Walls	Block Wall	High	No	No	No	Good																	
Included	M	101/102	General Room	Floor	Floor	Carpet	High	No	No	No	Good																	
												Date coded to a time period in which asbestos use was not widespread.																
Included	M	101/102	General Room	Ceiling	Ceiling	2'x4' ceiling tile with small pinholes and divots	High	No	No	No	Good																	
Included	M	101/102	General Room	Ceiling	Ceiling	1'x1' ceiling tile with pinholes	High	No	Yes	No	Good		Bulk	A-019	19-Jun-17													
Included	M	101/102	General Room	Plumbing	Sink	White Sink Undercoat	High	No	Yes	No	Good		Bulk	A-016	19-Jun-17													
														VS A-011, A- 012, A-013, A- 014, A-015														
Included	M	103	Garage	Walls	Walls	Drywall Joint Compound	High	No	Yes	No	Good																	
Included	M	103	Garage	Walls	Walls	Block Wall	High	No	No	No	Good																	
Included	M	103	Garage	Floor	Floor	Concrete	High	No	No	No	Good																	
Included	M	103	Garage	Ceiling	Ceiling	Wood Deck	High	No	No	No	Good																	
												Joints suspected to be packed with bulk lead.																
Included	M	103	Garage	Mechanical	Drain Lines	Cast Iron Joint Packing	High	No	No	No	Good																	
												Brown duct mastic painted white.		VS A-018														
Included	M	104	Office	Walls	Walls	Drywall Joint Compound	High	No	Yes	No	Good																	
Included	M	104	Office	Walls	Walls	Block Wall	High	No	No	No	Good																	
Included	M	104	Office	Floor	Floor	Carpet	High	No	No	No	Good																	
												Date coded to a time period in which asbestos use was not widespread.																
Included	M	104	Office	Ceiling	Ceiling	2'x4' ceiling tile with small pinholes and divots	High	No	No	No	Good																	
Included	M	105	Storage	Walls	Walls	Drywall Joint Compound	High	No	Yes	No	Good		Bulk	A-015	19-Jun-17													
Included	M	105	Storage	Floor	Floor	Concrete	High	No	No	No	Good																	
Included	M	105	Storage	Ceiling	Ceiling	Wood Deck	High	No	No	No	Good																	
Included	M	105	Storage	Mechanical	Piping	Bare Piping	High	No	No	No	Good																	
Included	M	105	Storage	Mechanical	Duct	Brown Duct Mastic	High	No	Yes	No	Good																	
Included	M	106	Washroom	Walls	Walls	Drywall Joint Compound	High	No	Yes	No	Good		Bulk	A-013	19-Jun-17													
Included	M	106	Washroom	Floor	Floor	1'x1' Off-White Floor Tile with Black Flecks	High	Yes	Yes	Yes	Good		Bulk	A-017	19-Jun-17	Chrysotile	Floor Tile	Trace	No	No	N/A	Annually	5	High	Manage in place.	50 ft²	Photograph 1	
														VS A-011, A- 012, A-013, A- 014, A-015														
Included	M	106	Washroom	Ceiling	Ceiling	Drywall Joint Compound	High	No	Yes	No	Good																	
Included	M	107	Open Area	Walls	Walls	Drywall Joint Compound	High	No	Yes	No	Good		Bulk	A-001, A-002	19-Jun-17													
Included	M	107	Open Area	Floor	Floor	Concrete	High	No	No	No	Good																	
Included	M	107	Open Area	Ceiling	Ceiling	Metal	High	No	No	No	Good																	
Included	M	107	Open Area	Walls	Windows	Black Window Caulking	High	No	Yes	No	Good		Bulk	A-008	19-Jun-17													
Included	M	107	Open Area	Electrical	Electrical Panels and Components	Electrical Panels and Components	High	Yes	No	Potential	Good	Not sampled due to safety concerns.													Inspect and sample if scheduled for removal.			
Included	M	108/110	Open Area	Walls	Walls	Drywall Joint Compound	High	No	Yes	No	Good		Bulk	A-006, A-007	19-Jun-17													
Included	M	108/110	Open Area	Floor	Floor	Concrete	High	No	No	No	Good																	
														VS A-001, A- 002, A-003, A- 004, A-005, A- 006, A-007														
Included	M	108/110	Open Area	Ceiling	Ceiling	Drywall Joint Compound	High	No	Yes	No	Good																	
Included	M	108/110	Open Area	Electrical	Electrical Panels and Components	Electrical Panels and Components	High	Yes	No	Potential	Good	Not sampled due to safety concerns.													Inspect and sample if scheduled for removal.			
Included	M	109	Washroom	Walls	Walls	Drywall Joint Compound	High	No	Yes	No	Good		Bulk	A-005	19-Jun-17													
Included	M	109	Washroom	Floor	Floor	Concrete	High	No	No	No	Good																	
														VS A-001, A- 002, A-003, A- 004, A-005, A- 006, A-007														
Included	M	109	Washroom	Ceiling	Ceiling	Drywall Joint Compound	High	No	Yes	No	Good																	
Included	M	111	Open Area	Walls	Walls	Drywall Joint Compound	High	No	Yes	No	Good		Bulk	A-003, A-004	19-Jun-17													
Included	M	111	Open Area	Floor	Floor	Concrete	High	No	No	No	Good																	
Included	M	111	Open Area	Ceiling	Ceiling	Metal	High	No	No	No	Good																	
Included	M	111	Open Area	Walls	Windows	Black Window Caulking	High	No	Yes	No	Good																	
														VS A-008														
Included	M	111	Open Area	Electrical	Electrical Panels and Components	Electrical Panels and Components	High	Yes	No	Potential	Good	Not sampled due to safety concerns.													Inspect and sample if scheduled for removal.			
Included	M	G-1	Storage	Walls	Walls	Drywall Joint Compound	High	No	Yes	No	Good		Bulk	A-014	19-Jun-17													
Included	M	G-1	Storage	Floor	Floor	Concrete	High	No	No	No	Good																	
Included	M	G-1	Storage	Ceiling	Ceiling	Wood Deck	High	No	No	No	Good																	
Included	M	G-1	Storage	Walls	Windows	Black Window Caulking	High	No	Yes	No	Good																	
														VS A-008														
Included	M	G-1	Storage	Mechanical	Duct	White Duct Mastic	High	No	Yes	No	Good	Brown duct mastic painted white.	Bulk	A-018	19-Jun-17													
												Joints suspected to be packed with bulk lead.																
														VS A-001, A- 002, A-003, A- 004, A-005, A- 006, A-007														
Included	M	G-2	Storage	Walls	Walls	Drywall Joint Compound	High	No	Yes	No	Good																	
Included	M	G-2	Storage	Walls	Walls	Block Wall	High	No	No	No	Good																	
Included	M	G-2	Storage	Floor	Floor	Concrete	High	No	No	No	Good																	
Included	M	G-2	Storage	Ceiling	Ceiling	Wood Deck	High	No	No	No	Good																	
												Brown duct mastic painted white.																
Included	M	G-2	Storage	Mechanical	Duct	White Duct Mastic	High	No	Yes	No	Good																	
Included	E	Exterior	Exterior	Walls	Walls	Metal	High	No	No	No	Good																	
Included	E	Exterior	Exterior	Walls	Caulking	White Building Caulking	High	No	Yes	No	Good		Bulk	A-009	19-Jun-17													
Included	E	Exterior	Exterior	Walls	Windows	Black Window Caulking	High	No	Yes	No	Good		Bulk	A-010	19-Jun-17													
Excluded	E	Exterior	Roof	Exterior Roof	Exterior Roof							Not assessed due to scope of work.																

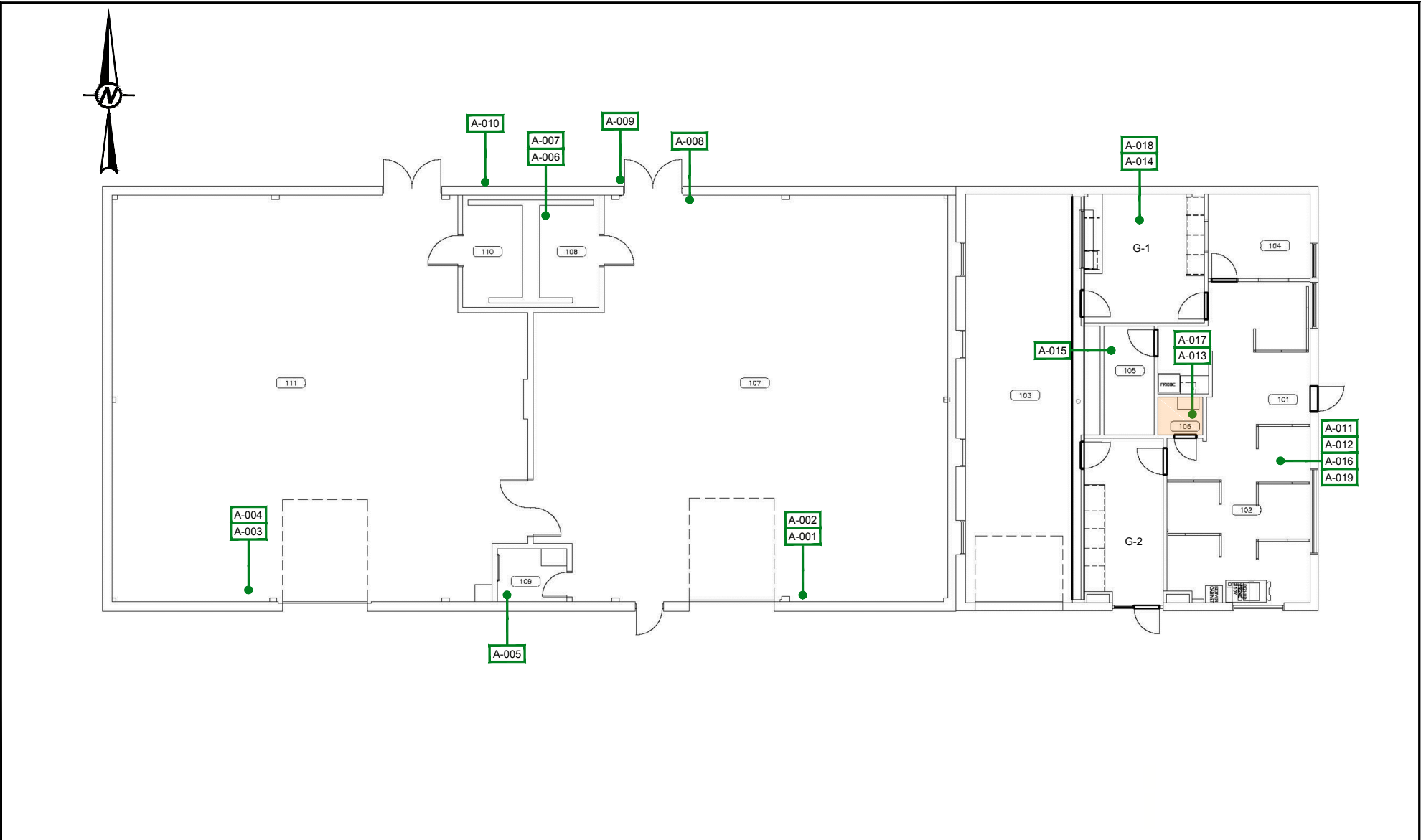


# ASBESTOS-CONTAINING BUILDING MATERIALS ASSESSMENT REPORT - NORTH CENTRAL SUBSTATION/ELECTRICAL TRANSFORMER BUILDING

---

## APPENDIX D

### Floor Plans



**LEGEND**

# ASBESTOS SAMPLE LOCATION

ASBESTOS - CONTAINING FLOOR TILE

**NOTE(S)**

1. ASBESTOS IS A CARCINOGEN. DO NOT BREATHE ASBESTOS DUST.

**REFERENCE(S)**

PLAN OBTAINED FROM INFRASTRUCTURE SERVICES DEPARTMENT CITY OF SASKATOON. DATED: 06/04/2004.

CLIENT  
CITY OF SASKATOON

CONSULTANT



YYYY-MM-DD 2017-08-14

DESIGNED KH

PREPARED VI

REVIEWED KH

APPROVED AG

SCHEMATIC ONLY, NOT TO SCALE

PROJECT  
ASBESTOS ASSESSMENT  
NORTH CENTRAL SUBSTATION AND ELECTRICAL TRANSFORMER BUILDING  
801 1 AVENUE NORTH

TITLE  
**MAIN FLOOR**

PROJECT NO. 1667963 CONTROL 1000-HM-0001 REV. 0 FIGURE 1

As a global, employee-owned organisation with over 50 years of experience, Golder Associates is driven by our purpose to engineer earth's development while preserving earth's integrity. We deliver solutions that help our clients achieve their sustainable development goals by providing a wide range of independent consulting, design and construction services in our specialist areas of earth, environment and energy.

For more information, visit [golder.com](http://golder.com)

Africa	+ 27 11 254 4800
Asia	+ 86 21 6258 5522
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 56 2 2616 2000

[solutions@golder.com](mailto:solutions@golder.com)  
[www.golder.com](http://www.golder.com)

**Golder Associates Ltd.**  
**16820 107 Avenue**  
**Edmonton, Alberta, T5P 4C3**  
**Canada**  
**T: +1 (780) 483 3499**



***BERSCH & ASSOCIATES LTD.***

July 15, 2013

**City of Saskatoon**

Infrastructure Services Department  
1101 Avenue P North  
Saskatoon, Sk.  
S7L 7K6

**ATTENTION: Brent Anderson**

**SUBJECT: North Central Substation - Asbestos Registry Report**

Please find attached our laboratory's results for the bulk material samples taken from the North Central Substation located at 801 1st Avenue North, Saskatoon, SK. The samples were analyzed in our laboratory for the identification of asbestos.

The results for the samples submitted were obtained by examination in accordance with the current USEPA 600/R-93/116 Method for the analysis of asbestos in building materials using polarized light microscopy and dispersion staining techniques. The detection limit of this method is listed as less than 1% by volume.

This test report relates only to the materials sent for examination and any use or extension of the information by the client of these results is the responsibility of the client. If any questions arise on the results of the attached information please contact our office. Thank you for this opportunity of service to your firm.

Included is a floor plan of the facility identifying the bulk sample locations. Photos of suspect materials sampled are also included following the floor plans.

Sincerely,

Dustin Fraess  
Bersch & Associates Ltd.  
File: B67BLE09

**Bersch & Associates Ltd.**

Box 3568

Humboldt, Sask. S0K 2A0

**PROJECT NO. B67.13****CLIENT: City of Saskatoon****Facility Services Branch, Saskatoon, SK.****Contact: Brent Anderson****Location: North Central Substation - 801 1st Avenue North, Saskatoon, SK.**

B67BAE09

**BULK SAMPLE ANALYSIS REPORT**

NO.	DATE	SAMPLE INFORMATION	ASBESTOS	%	ANALYST
B1	9-May-13	106 - Sheet flooring, yellow 6' square pattern	None detected		WB
B2	9-May-13	102 - perforated wall board	None detected		WB
B3	9-May-13	102 - Acoustical ceiling tile	None detected		WB

GENERAL NOTES:

1. All dimensions are in millimetres.
2. Drawings are not to be scaled.
3. All dimensions are to be taken in accordance with the specifications, unless otherwise noted.
4. Verify site conditions and location of all utilities prior to the start of construction.
5. Report all discrepancies to the Consultant.
6. If in doubt, ask.

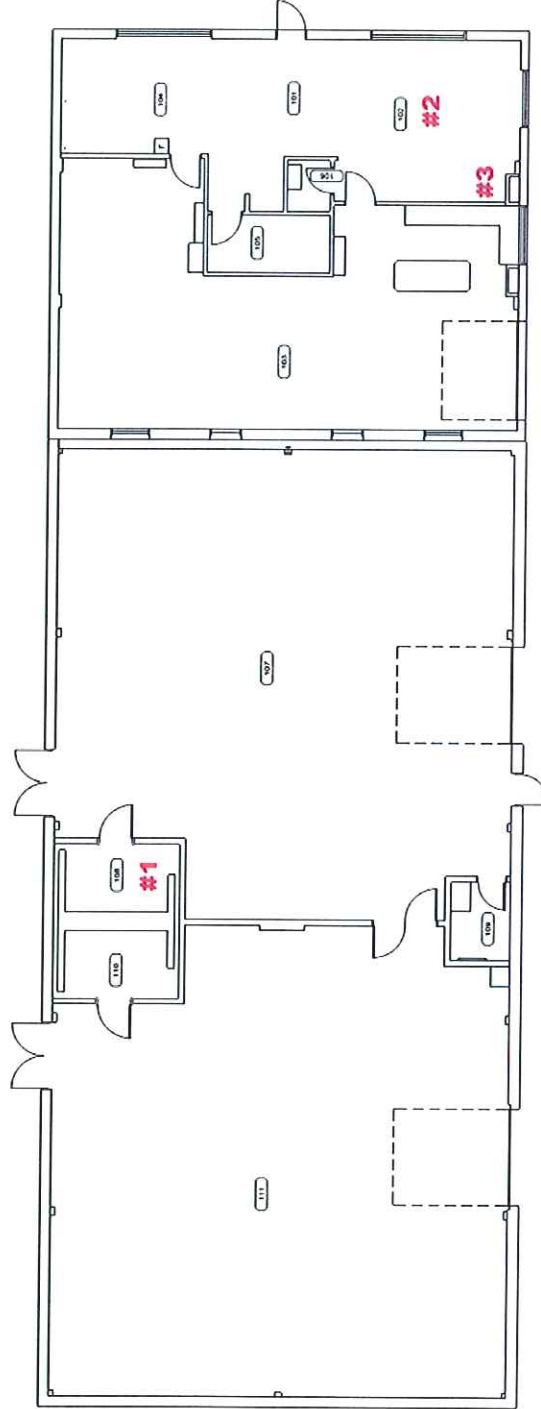
REV. REVISION FOR DATE

Drawn by: **RP** Checked by: **RP**  
Scale: **1:150** Date: **APR-06/2004**  
Sheet Name: **882** Author: **AB**

Project Title:  
**Main Floor  
Base Plan**

Project No.:  
**882**  
Substation  
**North Central**

Sheet No.:  
**882**  
Rev. No.: **1**



**# - Sample # Location**

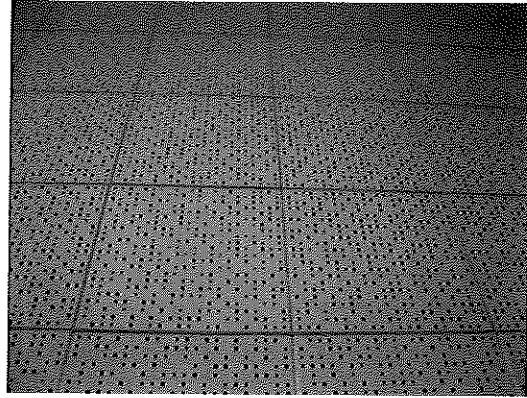


## BULK SAMPLE PHOTOS

#1) Sheet Flooring



#2/3) Wall/ Ceiling  
Board



***BERSCH & ASSOCIATES LTD.***

January 5, 2015

City of Saskatoon  
Project Services  
3130 Laurier Drive  
Saskatoon, SK  
S7L 5J7

**ATTENTION: Darrell Wasylowich**

**SUBJECT: Bulk Material Identification Report**

Please find attached our laboratory's results for the bulk sample collected on January 2, 2015 from 801 1<sup>st</sup> Avenue North, Saskatoon. The sample was forwarded to our laboratory for the identification of asbestos. No asbestos was detected within the sample.

The results for the samples submitted were obtained by examination in accordance with the current USEPA 600/R-93/116 Method for the analysis of asbestos in building materials using polarized light microscopy and dispersion staining techniques. The detection limit of this method is listed as less than 1% by volume.

This test report relates only to the material sent for examination and any use or extension of the information by the client of these results is the responsibility of the client.

If any questions arise on the results of the attached information please contact me at 978-6665. Thank you for this opportunity of service.

Sincerely,

Wes Berschiminsky  
Bersch & Associates Ltd.  
File: B67BLA02

***Bersch & Associates Ltd.***

B67BAA02

Box 3568

Humboldt, Sask. S0K 2A0

**BULK SAMPLE ANALYSIS REPORT**

**PROJECT NO. B67.15**

**CLIENT: City of Saskatoon**

**Location: 801 1st Avenue North, Saskatoon, Sk.**

**Contact: Darrell Wasylowich**

NO.	DATE	SAMPLE INFORMATION	ASBESTOS	%	ANALYST
1	2-Jan-14	Roofing Composition	None Detected		WB