University Response to the Internal Audit Report on Asbestos Management in Strand Hall

Since May 1986 SFU has had an Asbestos Exposure Control Plan (the “AECP”). Key aspects of the AECP require the university to: (1) identify asbestos containing materials (“ACM”) and maintain an inventory; (2) inform workers and contactors of ACM; (3) educate and train workers and supervisors on the safe work procedures that are required when interacting with ACM; and (4) in the event of potential asbestos exposure, notify as appropriate. This brief memo serves to contextualize the Internal Auditor’s report and to outline the steps that the university has taken to address the concerns raised in the report.

1. Identifying ACM

The AECP and the Workers Compensation Act, (the “Act”) at Part 6 of the Occupational Health and Safety Regulation (the “Reg.”), particularly s. 6.1 to 6.32 pertaining to asbestos, requires the university to have a qualified person conduct an inventory of all ACM and to keep that inventory current.¹

The first asbestos survey was conducted at SFU in 1982 by Robert Lockhart Ltd. in a limited number of buildings. In 1990/91, a more thorough survey was conducted by Pacific Environmental. In 2007/08, a re-assessment of buildings containing ACM was performed by Sure Hazmat and the inventory was updated. Strand Hall was included in the scope of both the 1990/91 and 2007/08 surveys. We have determined that both Pacific Environmental and Sure Hazmat did not identify ACM in ceiling tiles in Strand Hall.

The university is also obligated to identify all ACM present in the workplace by signs, labels or, when these are not practicable, other effective means.² The asbestos ceiling tiles in Strand Hall were not labelled. There are other building materials at SFU that are not labelled, such as drywall and flooring containing asbestos. However, it is industry standard that asbestos containing drywall and flooring are not labelled and this is accepted by WorkSafeBC.

SFU has retained Amec Foster Wheeler to conduct a review of SFU’s Asbestos Exposure Control Plan, including requirements for labelling, to ensure that SFU is compliant with its statutory obligations and that employees are following the Plan. Interviews with employees from Facilities Services, Safety & Risk Services, Residence & Housing and IT Services will be performed to assess compliance with the Plan. The final report is expected in summer 2017. In addition, an RFP is currently posted for a larger project to re-survey all buildings at the Burnaby and Vancouver campuses for ACM. Due to the large scope of this project, its anticipated completion date is December 2017. The asbestos containing ceiling tiles in Strand Hall were removed between August and October 2016 and have been removed from SFU’s asbestos inventory.

2. Informing workers of ACM

The university must ensure that, before a work activity begins that involves working with or in proximity to ACM identified in its inventory, a risk assessment is conducted by a qualified person to assess the work

¹ Reg. at s.6.4, which sets out the requirement for an inventory for occupied buildings as part of an asbestos management program. WorkSafeBC’s Handbook acknowledges at pg. 24 that not all ACM may be identified in this survey as some are hidden or would be damaged by sampling.
² Reg. at s.6.5
activity and to classify it as low-risk, moderate-risk or high-risk. SFU has retained Sure Hazmat since 2007 as its professional asbestos consultant to oversee all asbestos abatement projects and perform risk assessments of all work with the potential to disturb ACM.

The university has a TMA (maintenance management software) system to generate work orders. The information from the ACM inventory is incorporated into the TMA system. As a result of the April 2016 incident in Strand Hall, it was discovered that information from the ACM inventory tied to a “building-level” was not printing out on the work orders. Only the “room-level” warnings for ACM were printed on the work orders. Because the ceiling tiles were not entered into the asbestos database at the room level, this error meant that although Strand Hall was identified in TMA as having asbestos ceiling tiles at the building level, when a work order was generated for a specific room or area in Strand Hall, the ACM inventory information pertaining to the ceiling tiles, which should have appeared as ACM warnings, were not included in the work orders. This error has been corrected. Now, TMA generated work orders contain the relevant asbestos warnings (based on the ACM inventory information). Work orders that have an asbestos warning and that will impact ACM are reviewed by Facilities Services supervisors prior to assigning the work to the Trades staff.

The failure to have asbestos warnings related to the ceiling tiles in Strand Hall in the TMA work orders at the building level resulted in Facilities Services staff performing some maintenance work on the 3000 level of Strand Hall that involved the displacement of ceiling tiles without following safe work procedures. This resulted in the potential exposure to Facilities Services employees and building occupants to asbestos fibres. It is standard practice at the university that SFU employees do not perform any work on ACM. All work that has the potential to impact ACM is contracted out to qualified asbestos contractors and is overseen by Sure Hazmat, an independent qualified consultant who reviews all work procedures and conducts initial, ongoing and post abatement site inspections.

3. Educating/training on Safe Work Procedures

The university is required to ensure that workers who are at risk of exposure to asbestos are adequately trained. EHRS provides Asbestos Awareness training to Facilities Services, IT Services and Residence & Housing employees. Training is typically provided every 3 to 5 years and is conducted by an external trainer. EHRS offers annual (yearly) refresher training in which SFU asbestos protocols are discussed. As part of the awareness and refresher training all staff are advised to not disturb any building materials unless their supervisor and/or EHRS have confirmed that the activity will not disturb any ACM. At the beginning of a work activity (other than for regular maintenance), a project manager provides site/job specific instructions to workers (internal and external), which would include asbestos warnings and safe work procedures, where applicable. In addition, all contractors are required to participate in a contractor

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3 Reg. at s.6.6
4 Facilities Services superintendents or foremen perform a preliminary review of all work orders at the time they are assigned to trades staff. A more thorough assessment is performed of work orders with asbestos warnings.
5 Reg. at s.6.11
6 Contractors are responsible for sending a site supervisor and/or safety representative to the orientation and for relaying all information back to their project team and/or sub-contractors.
safety orientation, provided by EHRS, prior to starting work. General safety and project specific safety information is discussed, including the presence of ACM in SFU buildings.

Based on interviews with various Facilities tradespeople, the Internal Auditor identified possible gaps in the comprehensiveness and frequency of the training provided. The comprehensiveness of asbestos training materials and target audiences and the frequency of training offerings are currently being reviewed by EHRS.

With the launch of the New & Young Worker Safety Orientation in the fall of 2016, all new employees are now being provided with general information about asbestos and the asbestos-containing materials on campus.

4. Incidents and Notification

The Internal Audit report reviews past incidents of potential asbestos exposure in Strand Hall. In considering these incidents, it may be useful to categorize them into three relevant time periods: (a) pre-2011; (b) 2011 – 2016; and (c) the April 2016 Incident, based on the university’s state of knowledge about ACM during those time periods.

There were two major renovations in Strand Hall; the first in the Finance Department in 2009; and, the second in the Advancement Department in 2011. It was during the 2011 Advancement renovations that the university discovered ACM in the ceiling tiles due to a pre-renovation survey as required by WorkSafeBC.7 It appears that a pre-renovation survey should have been conducted for the 2009 Finance Department renovations but by oversight was not performed. Such a survey would likely have detected ACM in the ceiling tiles triggering the use of appropriate safe work procedures for that renovation and notice to the university regarding ACM in the ceiling tiles as early as 2009.

(a) Pre 2011 Incidents

As discussed, the university has had an AECP since 1986. Two separate surveys were conducted in 1990/91 and 2007/08, which covered Strand Hall, but did not identify ceiling tiles as ACM in their inventory. Prior to 2011 neither major renovations, including the 2009-2010 Finance Renovation, nor routine maintenance involving the ceiling tiles were performed using safe work procedures because they were not known to contain asbestos at that time. The procedural safeguards that should have prevented these incidents are:

(a) Identification of all ACM by an external asbestos consultant;
(b) Pre-renovation survey s.20.1128 for the 2009 Finance Department renovation; and
(c) Compliance with the Asbestos Exposure Control Plan that states “those materials not labelled or identified otherwise, shall be considered asbestos containing until analysis of the suspected material determines otherwise”.

In January 2017, Arcose Consulting was retained to complete a review of available exposure data related to the removal of asbestos containing ceiling tiles to determine the potential for worker and occupant

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7 S.20.112
8 S.20.112 requires a survey that must locate all ACM in the building or structure before any work commences, including materials that are hidden or normally inaccessible per pg. 24 of the WorkSafeBC Asbestos Handbook.
exposure. Occupational samples collected from asbestos abatement workers who had removed ceiling tiles during four separate abatement projects in Strand Hall from 2011 to 2016 were analyzed. These samples were representative of a worst case scenario not likely to be encountered by non-asbestos workers performing routine maintenance work or those workers working in the immediate area when tile ceiling work did occur.

Arcose concluded that the sampling data did not indicate that workers removing ceiling tiles for maintenance activities without provision of adequate personal protective equipment (e.g., respirators) would be overexposed to asbestos. Overexposure results when workers are exposed to contaminants in excess of the occupational exposure limit, which is the maximum airborne concentration of a toxic substance to which a worker can be exposed over a period of time without suffering any harmful consequences.

April 2011 to April 2016

As noted, extensive renovations to the second floor of Strand Hall in April 2011 identified ceiling tiles as ACM. Thereafter, major projects (falling under WorkSafeBC’s classification of “high-risk” work) that disturbed affected ceiling tiles were done following safe work procedures as required under WorkSafeBC guidelines; however, it appears that some routine maintenance involving displacement of the ceiling tiles may not have been performed according to safe work procedures as required. Routine maintenance would typically fall under “low-risk” or “moderate-risk” work.

WorkSafeBC defines “low-risk” work as work that involves working with or in proximity to ACM, if the material is not being cut, sanded, drilled, broken, ground down or otherwise fragmented or disturbed in such a way that asbestos fibers may be released. WBC defines “moderate-risk” work as work, other than a high-risk work, that involves working with or in proximity to ACB that is being cut, sanded, drilled, broken, ground down or otherwise fragmented or otherwise disturbed where it is necessary to use personal protective equipment (PPE) or engineering controls to prevent worker exposure to airborne asbestos fibers.

The Internal Auditor’s report indicated that there were 80 work orders involving disturbance of the ceiling tiles post April 2011. Therefore, there were potentially 80 instances between 2011 and 2016 where routine maintenance that involved the moving or removal of only a limited number of ceiling tiles were performed without appropriate safe work procedures. However, when maintenance or renovation work required the removal of a significant number of ceiling tiles, a qualified consultant and abatement contractor were retained to conduct the removal work in accordance with regulatory requirements. There were seven such projects since 2011 that involved the removal of a significant number of ceiling tiles in Strand Hall. All these projects were performed by asbestos abatement contractors with appropriate safety protocols in place. The procedural safeguards that should have prevented these incidents are:

(a) Enforcement of the requirements outlined in the Asbestos Exposure Control Plan by supervisors

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9 The guidelines provide for filing Notices of Project per s.20.2 with WorkSafeBC prior to beginning work.
10 WorkSafeBC Asbestos Handbook at pg. 11.
(b) Supervisors providing site/job specific instructions;
(c) Education, training and instruction relative to asbestos hazards and SFU protocols
(d) Labelling of ceiling tiles as ACM;
(e) TMA asbestos warnings at building level on work-orders;

However, as noted above, Arcose concluded that workers removing ceiling tiles for maintenance activities without provision of adequate personal protective equipment (e.g., respirators) would not be overexposed to asbestos.

April 2016 Incident

A contractor retained for routine maintenance disturbed ceiling tiles containing asbestos on the third floor of Strand Hall without employing safe work procedures. The contractor was not informed that the ceiling tiles contained asbestos. The procedural safeguards that should have prevented this incident are:

(a) Labelling of ceiling tiles as ACM;
(b) Project manager providing site/job specific instructions to the contractor;
(c) Contractor education provided by SFU pursuant to the Asbestos Exposure Control Plan;

Work was stopped and the university immediately informed the contractor retained by the university to perform the work, the Facilities Services Project Manager, and other workers in the vicinity of their potential exposure to asbestos. WorkSafeBC was also informed of the incident. A description of all notifications made as a result of the April 2016 incident is provided in Appendix A.

Conclusions

Although the university has had an ACEP plan since 1986 and it has endeavored to meet its statutory obligations in respect of the management of asbestos, several errors that had a compounding effect led to instances of potential exposures. In the first instance, two different consultants did not identify ACM in the ceiling tiles in Strand Hall; second, a pre-renovation survey was not conducted prior to the 2009 Finance Department renovation; third, the asbestos ceiling tiles were not labeled; forth, an error in the way that ACM inventory information printed onto work workers meant that asbestos warnings pertaining to the ceiling tiles were not indicated on work orders which, in turn, resulted in some maintenance work activities being performed without following safe work procedures.

The university has addressed these process gaps but these issues might have been detected earlier if there was routine enforcement of health and safety requirements by supervisors. All the actions taken by SFU since April 2016 to address the identified process gaps are listed in Appendix B.

With regards to notification, to ensure transparency, it a copy of the Internal Audit report will be provided to WorkSafeBC to ensure that they have information on file regarding the potential for past occupant exposure to asbestos in Strand Hall. Further, the university is providing some general and targeted information regarding asbestos to members of its community.
Summary of Notifications Provided by EHRS re: April 2016 Asbestos Incident in Strand Hall

Several notifications were made to Facilities Services staff, IT Services staff and Strand Hall building occupants in April 2016 informing them of the ceiling tile incident in Strand Hall and their potential exposure to asbestos. A description of these notifications is provided below.

Facilities Services and IT Services

- Memos, emails, tool box talks, one-on-one meetings and phone calls were used to communicate with Facilities Services and IT Services after the April 2016 incident to inform them of the incident and to remind them of the presence of AC ceiling tiles on the 3000 level of Strand Hall.
- The Director of Infrastructure Services and the Director of Maintenance & Operations were specifically told to inform their departments and employees of the incident and to ensure that no future work was performed that disturbed the ceiling tiles.
- On April 15, 2016 the Director of Maintenance & Operations sent an email to 34 Facilities Services employees, including Directors, Superintendents, Managers, Foreman and administrative staff informing them of the presence of asbestos containing ceiling tiles in Strand Hall and advising them that “no work that may disturb the ceiling tiles may be undertaken”.  
- In addition to the email dated April 15, 2016, all Facilities Services Superintendents were informed of the incident at the April 14, 2016, Managers’ meeting and by updated email dated April 22, 2016.
- EHRS staff participated in tool box talks with the Electrical, Mechanical, Buildings & Grounds and Central Stores departments that included Trades staff and the Superintendents to again inform them of the incident, to remind them of the AC ceiling tiles and to inform them of their potential past exposures to asbestos.

Safety Committees

- The Central University Health & Safety Committee, AQ/SH Safety Committee and the Facilities Services Safety Committee were informed of the incident at their May 2016 meetings.
- All 12 safety committees at SFU (CUHSH and 11 local safety committees) were provided with a copy of the WorkSafeBC order resulting from the April 2016 incident.

Strand Hall Building Occupants

- On April 14, 2016, after identifying all locations where the contractor performed work, EHRS staff visited impacted employees to explain the incident, the potential for asbestos exposure and to recommend that the Exposure Registry be filled out. Not all employees were in the office that day, therefore, EHRS sent a follow-up.
email on April 15, 2016, to the Directors\textsuperscript{11} of each department that worked in the affected area providing the same information and asking that the information be shared with all their employees.

- A memo was sent to all Financial Services staff in Strand Hall from the Acting Chief Safety Officer, Laura MacDonald, on April 25, 2016, that provided additional information about the incident and again encouraged impacted employees to complete the Exposure Registry. An offer was made by the Senior Director EHRS to meet with anyone that had additional questions or concerns.

### WorkSafeBC

- In April 2016, the Senior Director, EHRS informed Ms. Percy Chua, WorkSafeBC Officer, not only of the April 2016 incident but also of the reports received by building occupants that they had observed trades staff displace ceiling tiles on previous occasions without following safe work procedures. It was agreed that EHRS would inform current building occupants and trades staff of their potential asbestos exposure resulting from this past work. This was done and employees were encouraged to report their potential exposures to WorkSafeBC using the Exposure Registry.

- WorkSafeBC explained to EHRS that there was no legal requirement to inform previous building occupants of their potential exposure. It was Ms. Chua’s professional opinion that the risk of exposure to building occupants resulting from the displacement of ceiling tiles was low and therefore it was not reasonable to expect SFU to track down past employees to inform them of past incidents.

\textsuperscript{11} The email was sent to: Jessica Wong, Gary Chan, Winnie Ng, Allyson Biro, Janis Kennedy, Larry Guthrie, Rich Chambers and Sally Huang.
Appendix B

Actions Taken to Address Deficiencies Identified as a Result of the Strand Hall Asbestos Incident

Several actions were taken to address deficiencies identified as a result of the asbestos incident in Strand Hall in April 2016. A complete list of actions is provided below.

1) The TMA system was modified to ensure all areas known to contain asbestos, at both the building and room level, are flagged and asbestos warnings print out on work orders.

2) A project to remove the asbestos-containing ceiling tiles on the 3000 level of Strand Hall was completed in October 2016. In addition the following projects have been completed since 2011 when ACM ceiling tiles were identified in Strand Hall:
   a. All the ceiling tiles on the 2000 level of Strand Hall were removed and replaced during renovations starting in 2011
   b. Large sections of ceiling tiles on the 1000 level were replaced in 2011 and the remainder of the ceiling tiles on the 1000 level were replaced in 2014.
   c. Project planning for the removal of the remaining ACM ceiling tiles on the 3000 level was initiated in 2015.

3) EHRS worked with IT Services to re-build the Asbestos inventory database. New functions include the ability for the database to be accessed by anyone with a SFU computing ID.

4) The Asbestos Exposure Control Plan was updated to clarify roles and responsibilities of EHRS and Facilities Services employees, to clarify that no asbestos-containing materials are labeled at the Vancouver campus, to add known asbestos-containing materials at the Burnaby campus (e.g., window caulking), to remove reference to an SFU asbestos work permit, to clarify the requirement for employee and contractor training and the need for refresher training, and to add language about waste management.

5) A Project Initiation Checklist for Contractors was developed to identify potential hazards of work activities performed by third-party contractors.

6) A database was created of all contractors hired by Facilities Services in the past year. The date of each contractor’s last safety orientation was identified. This database is available to all Facilities Services staff. Every time a Project Manager, superintendent or manager hires a contractor to perform work, they will reference the database to determine whether the contractor needs a safety orientation. EHRS will conduct the orientations, maintain the database and will update the orientation dates as they occur.

7) All current continuing service contractors who had not received a safety orientation in the past year were identified. Facilities Services contacted these contractors to schedule a safety orientation.

8) Training for managers and supervisors in Facilities Services, IT Services and Residence & Housing on SFU’s Contractor Management Program and supervisor roles and responsibilities relative to health and safety was conducted on July 12 and 14, 2016.

9) Asbestos Awareness training was provided to workers and supervisors in Facilities Services, IT Services and Residence & Housing on June 14 and 15, 2016.

10) The University’s Contractor Safety Orientation and Information Manual was updated to reflect these initiatives.
Appendix B

11) With the launch of the New & Young Worker Safety Orientation in the fall of 2016, all new employees are now being provided with general information about asbestos and the asbestos-containing materials on campus.

12) An external consultant was hired in February 2017, to perform a review of SFU’s Asbestos Exposure Control Plan to ensure that it meets regulatory requirements and being complied with by employees at the University. The final report is anticipated in summer 2017.

13) An RFP was issued on March 27, 2017, to identify a qualified consultant to perform an asbestos re-survey at both the Burnaby and Vancouver campuses. Due to the large scope of this project, its anticipated completion date is December 2017.
Asbestos Management Review – Strand Hall

December 2016
# Table of Contents

I. Executive Summary .................................................................................................................. 2

II. Background ............................................................................................................................ 15

III. April 2016 incident ................................................................................................................. 16

IV. Past Incidents ......................................................................................................................... 16

V. Detailed Observations and Recommendations ......................................................................... 19

   1.1 Issue notification to Strand Hall building occupants [and Facilities tradespeople] regarding past incidents involving potential asbestos exposure in Strand Hall to clarify previous communications ........................................................................................................... 19

   1.2 Notification to former Facilities tradespeople, external contractors and Strand Hall building occupants on past incidents involving potential asbestos exposure in Strand Hall has not been given .................................................................................................................................................. 20

   2. Facilities Operations management might not be aware of specifics of how ceiling tiles containing asbestos are handled by the Facilities tradespeople and external contractors at worksites in Strand Hall ......................................................................................................................... 21

   3.1 There is a gap in communication and coordination within Facilities Services involving the ceiling tiles containing asbestos in Strand Hall .................................................................................................................... 22

   3.2 There is a gap in communication and follow-up between EHRS and Facilities Operations involving the ceiling tiles containing asbestos in Strand Hall ............................................................................................................. 23

   3.3 There is a gap in interpretation of the absence of asbestos labels by IT Services ................. 24

   4.1 There is a gap in compliance with the AECP – ceiling tiles containing asbestos in Strand Hall were not labelled .................................................................................................................................................. 24

   4.2 There is a gap in compliance with the AECP – EHRS did not follow up to ensure that the asbestos warning regarding the ceiling tiles containing asbestos in Strand Hall is on TMA work orders .................................................................................................................... 25

   5. The asbestos consultant did not identify the ceiling tiles containing asbestos in Strand Hall during its re-inspection ................................................................................................................................. 26

APPENDIX A – Photos from the April 2016 Incident at Strand Hall (“SH”) .................................. 28

APPENDIX B – Internal Audit Detailed Procedures ...................................................................... 30

APPENDIX C – Photos from the 2009/10 Financial Services Renovation ..................................... 31


APPENDIX E – WorkSafeBC Regulations on Asbestos ................................................................. 36

APPENDIX F – Major Renovation Projects at Strand Hall (January 2005 – April 2016) ............. 37

APPENDIX G – Photos of Damaged Ceiling Tiles Containing Asbestos at Strand Hall 3000 Level .... 38

APPENDIX H – Strand Hall 3000 Level Ceiling Tile Replacement Project .................................... 43
I. Executive Summary

Internal Audit has completed a review of University policies and procedures related to the management, handling and control of ceiling tiles containing asbestos present in Strand Hall on the Burnaby campus.

Asbestos is a hazardous material which requires proper handling in accordance with the rules of WorkSafeBC. The WorkSafeBC requirements were first formally documented in the Occupational Health and Safety Regulation (“OHSR”), enacted in April 1998. According to the WorkSafeBC publication on Safe Work Practices for Handling Asbestos (published in 2013), “if employers and workers do not take proper precautions for work around asbestos, workers may develop serious chronic health problems or even die of an asbestos-related disease.”

“Asbestos was the cause of death in 367 accepted claims in 2015, according to figures compiled by the Association of Workers’ Compensation Boards of Canada, making it the No. 1 workplace killer in the country. Since 1996, there have been 5,614 recorded work-related fatalities from asbestos.”

*Globe and Mail, Wednesday, December 7, 2016*

This review was initially prompted by an incident, which occurred at Strand Hall 3000 level in April 2016, where an external contractor disturbed and damaged ceiling tiles containing asbestos without employing safe work procedures. This disturbance may have exposed the external contractor and nearby building occupants to asbestos. Refer to Appendix A for the photos showing the damage in the ceiling tile outside Strand Hall Room 3155 and white debris on the floor underneath the same ceiling tile, which demonstrates that the ceiling tile containing asbestos could be damaged due to its friable nature.

Our review consisted of (i) conducting interviews; (ii) performing process walk-throughs; (iii) reviewing documentation; and (iv) sampling relevant records. Refer to Appendix B for a detailed listing of procedures performed.
The following is a summary of our key findings organized chronologically surrounding the initial discovery of ceiling tiles containing asbestos in Strand Hall in 2011:

**A. Pre-April 2011 (prior to the discovery of ceiling tiles containing asbestos in Strand Hall)**

**A.1 Ceiling tiles containing asbestos in Strand Hall were not identified**

**A.1.1 Asbestos contained in the ceiling tiles in Strand Hall were not identified**

Asbestos contained in the ceiling tiles in Strand Hall was not identified in any prior asbestos surveys conducted for the Burnaby campus. The University’s former asbestos consultant did not identify the ceiling tiles containing asbestos during the initial asbestos survey for Strand Hall performed in 1991 and the current asbestos consultant did not identify the ceiling tiles containing asbestos during the most recent asbestos re-inspection for Strand Hall performed in 2008. It was not until April 2011, during a pre-construction inspection for a major renovation project at the Strand Hall 2000 level University Advancement area, that the current asbestos consultant contracted by Facilities Services – Campus Planning and Development (“Facilities Development”) identified the presence of asbestos in the ceiling tiles in Strand Hall.

It follows that, prior to April 2011, all major renovation projects in Strand Hall, which were managed by Facilities Development, would have been performed without employing safe work procedures when dealing with ceiling tiles in Strand Hall, which is now known to have contained asbestos. Of note is the 2009/10 Financial Services renovation. Our review of project documentation indicates that a pre-renovation asbestos survey was likely not done. This survey may have identified the ceiling tiles containing asbestos. As a result, the renovation work involving removing and handling of the ceiling tiles containing asbestos proceeded without appropriate safety precautions or procedures in place. For example, affected Financial Services staff could have been relocated out of the renovation area to prevent any risk of exposure to asbestos during the construction. Furthermore, the renovation area could have been sealed off with asbestos containment barriers to prevent contaminated air from being circulated to the rest of the Strand Hall building. Based on the records we reviewed, given that insufficient safe work procedures (for asbestos) were employed, we estimate that a number of external contractor staff and Strand Hall building occupants may have been exposed to asbestos over the two-month renovation period until the disposal of all ceiling tiles containing asbestos by an external contractor, again without following any safe work procedures for properly disposing materials containing asbestos.

Refer to Appendix C for the January 2010 photo of a building occupant sitting at the desk inside the construction zone, with a stack of ceiling tiles containing asbestos nearby.

**A.1.2 The pre-April 2016 regular maintenance work**

The pre-April 2016 regular maintenance work (managed by Facilities Services – Maintenance and Operations (“Facilities Operations”)) and the pre-April 2011 major renovation projects (managed by Facilities Development) in Strand Hall that involved
ceiling tiles containing asbestos would have been performed without employing safe work procedures when dealing with ceiling tiles containing asbestos.

This would have involved removing, replacing, repairing and repositioning ceiling tiles, possibly resulting in the ceiling tiles being damaged due to its friable characteristics. We identified at least 140 work orders between January 2005 and April 2011 that likely involved disturbing ceiling tiles containing asbestos in Strand Hall.

B. April 2011 to April 2016 (following the discovery of ceiling tiles containing asbestos in Strand Hall but prior to the April 2016 incident):

B.1 There were some gaps in compliance with the University’s Asbestos Exposure Control Plan (“AECP”)

Since 1986, the University has had the AECP, which provides procedures and guidelines in dealing with asbestos in the workplace. The overall responsibility and authority for the administration of the AECP was assigned to Facilities Services from January 2004 to May 2012 and to Environmental Health and Research Safety department (“EHRS”) after May 2012. Since November 2009, EHRS has been responsible for “ensur[ing] that the location of asbestos containing materials and inform[ing] building occupants and maintenance personnel as well as contracted trades, about the presence and location of asbestos containing materials [through] the tagging and identification system.” However, such procedures in the AECP were not fully complied with by EHRS, specifically:

a) Our review indicated that, even though EHRS was aware of the existence of ceiling tiles containing asbestos in Strand Hall by April 2011, the ceiling tiles containing asbestos in Strand Hall were not promptly and appropriately labelled in accordance with the 2009-2011 AECP section 3.1.2 (b) – EHRS Responsibilities & 3.2 - Identification and Labelling of Asbestos Containing Materials. Timely proper labelling would likely have alerted the Facilities tradespeople and external contractors as to the presence of asbestos in the ceiling tiles in Strand Hall. It was not until after the April 2016 incident, that the ceiling tiles containing asbestos in Strand Hall were labelled.  

b) Our review of a sample of TMA work orders against the EHRS Asbestos Inventory further indicated that EHRS did not properly follow up to ensure that the asbestos warning regarding the ceiling tiles containing asbestos in Strand Hall was printed on the TMA work orders in accordance to the 2009-2011 AECP section 3.1.2 (a) - EHRS Responsibilities & 3.3.1 - TMA. Before starting any regular maintenance work, Facilities tradespeople and external contractors would rely on the TMA work orders for notification of asbestos containing materials in determining whether appropriate safety measures needs to be taken. It was not until after the April 2016

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1 OHSR Section 6.5 (enacted in 1998) – The employer must ensure that all asbestos-containing materials present in the workplace are identified by sign, labels or when these are not practicable, other effective means.
incident that the asbestos warning regarding the ceiling tiles containing asbestos in Strand Hall was discovered to be missing from the TMA work orders. The TMA work order began including the EHRS asbestos warning regarding the ceiling tiles containing asbestos in Strand Hall in October 2016.

B.2 Communication of the presence of asbestos in the ceiling tiles in Strand Hall to all relevant stakeholders

Our review of project documentation (between 2011 and 2016) and the Facilities Services Safety Committee meeting minutes (between 2010 and 2016) indicates that the information relating to the presence of asbestos in the ceiling tiles in Strand Hall was shared or communicated to the following stakeholders:

- Facilities Development - was notified in April 2011 and external contractors contracted by Facilities Development were notified for each subsequent major renovation project in Strand Hall after April 2011;
- EHRS - was notified in April 2011;
- Asbestos Project Coordinator, Superintendent, Mechanical, Assistant Superintendent, Mechanical, and Foreman, Plumbing – were aware that the ceiling tiles at SH-3174 (kitchen) and the hallway adjacent to SH-3171 (the large meeting room) contain asbestos in October 2011;
- Facilities Services Safety Committee - was notified by EHRS between September and December 2015; and
- Director of Maintenance and Operations at Facilities Operations - was notified by EHRS in November 2015

However, based on our interviews with the staff, we determined that the presence of asbestos in the ceiling tiles in Strand Hall was not effectively communicated to some key stakeholders:

- Facilities tradespeople at Facilities Operations who perform regular maintenance work in Strand Hall;
- IT Services (which manages network cabling work in Strand Hall) – see Section 3.3 of this report for more details;
- External contractors contracted by Facilities Operations or IT Services; and
- Strand Hall building occupants.

B.3 There is a gap in communication between Facilities Operations management and Facilities tradespeople / external contractors

At the Facilities Services Safety Committee meeting held in September 2015, attended by EHRS and Facilities Operations, a carpenter from Facilities Operations informed the committee that he had a reasonable suspicion that some of the ceiling tiles in Strand Hall
contained asbestos and advised the Committee to look into the situation. Since then, there were exchanges between EHRS and Facilities Services regarding the identification and location of ceiling tiles containing asbestos in Strand Hall, to facilitate the replacement of these ceiling tiles. In each of its monthly meetings from September 2015 to April 2016, the Facilities Services Safety Committee identified and concluded that ceiling tiles containing asbestos in Strand Hall needed to be gradually replaced (cost estimate for the project was received in February 2016). However, Facilities Operations management neither communicated this asbestos warning to Facilities tradespeople and external contractors nor gave instructions to Facilities tradespeople and external contractors to immediately halt handling the affected ceiling tiles containing asbestos in Strand Hall as required by the 2012-2016 AECP section 3.1.3 – Contractors and Maintenance Personnel. We were informed that, at the time, Facilities Operations management exclusively relied on the training, labelling, and TMA work orders for notification of the ceiling tiles containing asbestos to the Facilities tradespeople and external contractors. Nevertheless, in Strand Hall, the ceiling tiles containing asbestos were not labelled and the required asbestos warning regarding the ceiling tiles containing asbestos was not on the TMA work orders.

From our interviews with Facilities Operations Superintendents, we determined that Facilities Operations management might not be fully aware of specifics of how ceiling tiles containing asbestos were being handled by Facilities tradespeople and external contractors at worksites, nor is Facilities Operations management familiar with the frequency of these instances and risks of exposure to asbestos.

**B.4 There is a gap in communication between Facilities Development and Facilities Operations**

Knowledge transfer of information from the Facilities Development team (for the 2011 University Advancement renovation) to the Facilities Operations team as to the presence of asbestos in the ceiling tiles could have been a safeguard that prevented the incidents involving potential asbestos exposure between April 2011 and April 2016.

**B.5 There is a gap in communication between EHRS and Facilities Operations**

Given what has transpired, we feel the current system of communication and follow-up between EHRS and Facilities Operations management involving the ceiling tiles containing asbestos in Strand Hall could have been improved. From our interviews with staff, we identified several instances of ineffective communication between EHRS and Facilities Operations. These are discussed in Section 3.2 of this report.
**B.6 Summary**

Although ceiling tiles containing asbestos in Strand Hall were identified in April 2011, regular maintenance work affecting ceiling tiles containing asbestos, which was managed by Facilities Operations, continued without employing safe work procedures until the April 2016 incident. We determined that there were at least 80 work orders between April 2011 and April 2016 that likely involved disturbing ceiling tiles containing asbestos in Strand Hall. We further note that, after the Facilities Services Safety Committee was notified in September 2015, there were another four additional work orders (including the April 2016 incident) between September 2015 and April 2016 that involved the likely disturbance of ceiling tiles containing asbestos in Strand Hall.

Furthermore, improper handling of ceiling tiles containing asbestos in Strand Hall up until the April 2016 incident may have resulted in possible non-compliance with the WorkSafeBC requirements. The following table outlines some of the applicable WorkSafeBC requirements and examples of possible gaps in compliance:

<table>
<thead>
<tr>
<th>WorkSafeBC Requirement</th>
<th>Example of Possible Gaps in Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Ensuring the health and safety of all workers at worksites (Workers Compensation Act, enacted in 1917)</td>
<td>Airborne asbestos fibres may have been released when Facilities tradespeople and external contractors disturbed ceiling tiles containing asbestos during the Pre-April 2011 major renovation projects or the Pre-April 2016 regular maintenance work in Strand Hall. These workers and nearby Strand Hall building occupants did not have the adequate personal protective equipment and may have been exposed to asbestos fibres.</td>
</tr>
<tr>
<td>b) Ensuring workers and supervisors are adequately instructed and trained (OHSR section 6.11, enacted in 1998)</td>
<td>We recognize that EHRS provided training; however the training could have been more effective. Based on interviews with various Facilities tradespeople, there appears to be possible gaps in the comprehensiveness and frequency of the training provided.</td>
</tr>
<tr>
<td>c) Providing personal protective equipment for workers (OHSR section 6.29 - 6.31, enacted in 1998)</td>
<td>Facilities tradespeople and external contractors may have disturbed asbestos ceiling tiles in Strand Hall with no personal protective equipment (e.g. respirator with a P100 filter).</td>
</tr>
</tbody>
</table>
d) Employing proper safe work procedures including proper clean-up and disposal of materials containing asbestos (OHSR section 6.25 - 6.28, enacted in 1998)

Ceiling tiles containing asbestos in Strand Hall were removed and handled during the pre-April 2011 renovation projects (e.g. 2009/10 Financial Services renovation).

Not knowing the ceiling tiles containing asbestos, proper clean-up (e.g. HEPA vacuum or wet wipe the surrounding area) and disposal procedures (e.g. contain the ceiling tiles containing asbestos in a sealed container) were not followed.

e) Ensuring that all asbestos containing materials are identified by signs, labels, or other effective means (OHSR section 6.5, enacted in 1998)

Labelling of ceiling tiles containing asbestos at Strand Hall 3000 level was not done until the end of April 2016.

The asbestos warning regarding the ceiling tiles containing asbestos in Strand Hall was not on the TMA work orders until October 2016.

C. After the April 2016 Incident:

C.1 WorkSafeBC

Following the review of the April 2016 incident, WorkSafeBC issued an inspection report and an order to the University to comply with its requirements. WorkSafeBC concluded that:

“Facilities Services Project Managers are responsible for communicating hazards to third-party contractors. Project Managers are notified of asbestos and other hazardous materials within buildings via internal work order and asbestos inventory (through the TMA system). A contributing factor identified in the preliminary incident investigation was the ceiling tiles were not labeled as asbestos-containing material. At the time of inspection, another contributing factor was identified: the limitations of the TMA system to accurately pin-point particular locations of ACM. Project Managers within Facilities Services are not effectively coordinating and communicating the hazards of work activities, which may potentially expose surrounding workers and areas. A coordination system within Facilities Services must be implemented to ensure hazards that result from third-party work activities are being effectively communicated from the Project Managers to the contractor(s).”

Refer to Appendix D for an extract of the WorkSafeBC inspection report dated April 26, 2016.
C.2 **Strand Hall 3000 Level Ceiling Tile Replacement Project**

The ceiling tiles containing asbestos at Strand Hall 3000 level was replaced with non-asbestos containing ceiling tiles between August and October 2016. Safe work procedures in accordance to WorkSafeBC regulations and University policies were followed during this replacement project. See Appendix H for a summary of the asbestos abatement work.

C.3 **Past Incidents where there may have been asbestos exposure**

We identified at least four major renovation projects (pre-2011) and 220 work orders over the past 10 years where asbestos may have been released while Facilities tradespeople and external contractors worked in ceiling tile areas without practicing safe work procedures in Strand Hall. We estimate (based on employee counts of individuals who worked in Strand Hall over this period of time) the number of individuals (including Facilities tradespeople, external contractors and Strand Hall building occupants) that may have potentially been exposed to asbestos could be in the hundreds.

To date, other than those individuals who were notified of their potential exposure in relation to the April 2016 incident, we understand that, in the case of all past incidents (including the 2009/10 Financial Services renovation), the majority of these individuals have not been directly notified of a potential exposure to asbestos. We further understand that WorkSafeBC has been notified that there may have been past incidents of potential exposure to asbestos. However, details and statistics were not formally provided to WorkSafeBC, nor was any notification in writing of these past incidents. Not doing so may preclude current and former Facilities tradespeople, external contractors and Strand Hall building occupants from being fully informed of the extent of potential exposure to asbestos, as well as preventing them from having the opportunity to register with the WorkSafeBC Exposure Registry.
Timeline of Key Events

1971
- Strand Hall construction is completed using ceiling tiles containing asbestos

1986
- SFU Asbestos Exposure Control Plan comes into effect

1991
- The initial inspection to document asbestos materials found in Strand Hall does not identify the ceiling tiles containing asbestos

1998
- Apr 1998: The Occupational Health and Safety (OHS) Regulation of British Columbia relating to asbestos is enacted on Apr. 15, 1998

2006
- Jul 2008: The most recent asbestos material re-inspection does not identify the ceiling tiles containing asbestos in Strand Hall

2008
- 2009 - 2010: Building occupants may have been exposed to asbestos while working inside the construction zone during the Financial Services renovation

2011
- Pre-Apr 2011: All major renovation projects are performed without safe work procedures, resulting in potential exposure to asbestos by workers.

2012
- Apr 2011: Asbestos in ceiling tiles in Strand Hall is discovered, but they do NOT get labelled.

2015
- Post-Apr 2011: Major renovation projects in Strand Hall commence employing safe work procedures

2016
- Pre-Apr 2016: Regular maintenance work orders in Strand Hall continue without safe work procedures. Workers and building occupants are potentially exposed.

2017
- Apr 2016: Ceiling tiles containing asbestos are labelled in Strand Hall

- Aug - Oct 2016: Ceiling tiles containing asbestos in Strand Hall are removed with safe work procedures (see Appendix H for more details)
Summary of Recommendations

This report identifies a number of areas for improvement within EHRS and Facilities Services in the management of materials containing asbestos. They are listed below:

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Status</th>
<th>Completed By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal notification to WorkSafeBC regarding past incidents involving potential asbestos exposure in Strand Hall</td>
<td>In progress – SFU will forward a copy of this Internal Audit report to WorkSafeBC.</td>
<td>EHRS</td>
</tr>
<tr>
<td>EHRS should seek acknowledgement or documentation from WorkSafeBC on the verbal reporting of past incidents in Strand Hall involving potential exposure to asbestos including (i) the pre-April 2011 major renovation projects such as the 2009/10 Financial Services renovation; and (ii) the pre-April 2016 regular maintenance work disturbing the ceiling tiles containing asbestos where safe work procedures were not employed.</td>
<td>In progress – SFU will forward a copy of this Internal Audit report to WorkSafeBC.</td>
<td>EHRS</td>
</tr>
</tbody>
</table>

1.1 Issue notification to Strand Hall building occupants [and Facilities tradespeople] regarding past incidents involving potential asbestos exposure in Strand Hall to clarify previous communications.

EHRS should provide a notice to Strand Hall building occupants to revise the April 25, 2016 Communication Notice with respect to the statement that ‘when previous renovations were performed in the building, the asbestos ceiling tiles were removed following safe work procedures’. In our opinion, this statement is overly broad and a communication should be issued that accurately reflects the fact that some renovation work and regular maintenance work involving ceiling tiles containing asbestos prior to the April 2016 incident, for example the 2009/10 Financial Services renovation, were likely performed without following safe work procedures.

The notice should remind building occupants [and Facilities tradespeople] to register on the WorkSafeBC Exposure Registry.
## 1.2 Notification to former Facilities tradespeople, current / former external contractors and former Strand Hall building occupants on past incidents involving potential asbestos exposure in Strand Hall has not been given

EHRS should seek legal advice to determine whether former Facilities tradespeople, current / former external contractors and former Strand Hall building occupants should be notified of their potential asbestos exposure arising from past incidents. Also, all parties should be made aware of the WorkSafeBC Exposure Registry.

| Completed – Legal advice was obtained and the University has concluded that it has no legal obligation to inform former employees and external contractors about their potential asbestos exposure from past incidents. | SFU Legal Counsel |

## 2. Facilities Operations management might not be aware of specifics of how ceiling tiles containing asbestos are handled by the Facilities tradespeople and external contractors at worksites in Strand Hall

Facilities Services management, assisted by EHRS, should periodically select a sample of regular maintenance work orders that require working with asbestos materials and perform site inspection or ride-along following a Facilities tradesperson or an external contractor with the goal to ensure that safe work practices are followed in accordance with the AECP at the worksite.

| In progress | EHRS and Facilities Services |

## 3.1 There is a gap in communication and coordination within Facilities Services involving the ceiling tiles containing asbestos in Strand Hall

The Facilities Services Safety Committee should include representatives from both Facilities Development and Facilities Operations, in order to improve sharing of information regarding asbestos materials and other safety concerns between the two groups. These representatives should have a mandate to communicate the items of discussion to their co-workers.

| Completed in April 2017 | Facilities Services |
### 3.2 There is a gap in communication and follow-up between EHRS and Facilities Operations involving the ceiling tiles containing asbestos in Strand Hall

<table>
<thead>
<tr>
<th>Action</th>
<th>Status</th>
<th>responsible Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHRS should follow-up to ensure that their messages and communications are properly received and understood by intended recipients. EHRS should attend the Toolbox Talks and take attendance. For Facilities tradespeople who missed the Toolbox Talks, EHRS should brief these individuals on safety issues and asbestos warning.</td>
<td>In progress – EHRS is providing binders and schedules for Facilities Services to keep track of the attendance and subject matters discussed at the Toolbox Talks.</td>
<td>EHRS and Facilities Services</td>
</tr>
</tbody>
</table>

### 3.3 There is a gap in interpretation of the absence of asbestos labels by IT Services

<table>
<thead>
<tr>
<th>Action</th>
<th>Status</th>
<th>responsible Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHRS should follow-up to ensure that all relevant stakeholders (e.g. Facilities Services, IT Services, and their external contractors) are aware of and understand the terms in AECP. Since IT Services has no access to TMA and not all asbestos containing materials are labelled, EHRS should work with IT Services to identify alternate methods of communication so IT Services employees and their external contractors will be able to identify the presence of asbestos containing materials on the Burnaby campus.</td>
<td>In progress – EHRS has provided a copy of EHRS Asbestos Inventory in PDF format to the manager of IT Services for identification of asbestos containing materials on Burnaby campus.</td>
<td>EHRS</td>
</tr>
</tbody>
</table>

### 4.1 There is a gap in compliance with the AECP – ceiling tiles containing asbestos in Strand Hall were not labelled

<table>
<thead>
<tr>
<th>Action</th>
<th>Status</th>
<th>responsible Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.1 EHRS should verify that all materials containing asbestos identified in the EHRS Asbestos Inventory has been completely and adequately labelled. All asbestos containing materials should be appropriately labelled as soon as possible. Where labelling is impractical, EHRS should ensure that these exceptions are documented and that alternate methods of communication or notification are readily available and understood by Facilities tradespeople and external contractors.</td>
<td>In progress – SFU has retained Amec Foster Wheeler to conduct a review of SFU’s Asbestos ECP including requirements for labelling. In addition, an RFP is currently posted for a larger project to re-survey all buildings at the Burnaby and Vancouver campuses for ACM. The ceiling tiles containing asbestos at Strand Hall 3000 level were replaced as of October 2016.</td>
<td>EHRS</td>
</tr>
</tbody>
</table>
4.1.2 EHRS should review the quality of existing labels to ensure they are clearly readable and visible, and that labels are within a reasonable distance and location to ensure they can be easily spotted by Facilities tradespeople, external contractors and building occupants.

| 4.1.2 EHRS should review the quality of existing labels to ensure they are clearly readable and visible, and that labels are within a reasonable distance and location to ensure they can be easily spotted by Facilities tradespeople, external contractors and building occupants. | In progress | EHRS |

4.2 There is a gap in compliance with the AECP – EHRS did not follow up to ensure that the asbestos warning regarding the ceiling tiles containing asbestos in Strand Hall is on TMA work orders

| EHRS should periodically review a sample of TMA work orders to ensure that the asbestos warnings on the TMA work orders match with the EHRS Asbestos Inventory information. | Completed in October 2016 – Printed warnings on TMA work orders are now working properly. | EHRS |

5. The asbestos consultant did not identify the ceiling tiles containing asbestos in Strand Hall during its re-inspection

| 5.1 EHRS and Facilities Services should replace the current asbestos consultant with an alternate qualified asbestos consultant, who can provide a fresh set of eyes for the next Asbestos Inventory re-inspection. Re-inspection should entail a complete identification and inventory of asbestos materials on Burnaby campus. EHRS should ensure that the re-inspection process and scope are fully understood by EHRS and are designed to maximize the discovery of any other unknown asbestos materials on Burnaby campus. | In progress – An RFP was issued on March 27, 2017 to identify a qualified consultant to perform an asbestos re-survey at both the Burnaby and Vancouver campuses. The bidding is now closed. Estimated completion date of the survey is December 2017. | EHRS and Facilities Services |

| 5.2 EHRS should increase the frequency of the Asbestos Inventory re-inspection. More regular re-inspections may increase the chances of identifying materials containing asbestos. | In progress – EHRS agrees with the recommendation. The AECP will be updated to include a provision for more frequent inspections. | EHRS |
Asbestos
WorkSafeBC’s publication on Safe Work Practices for Handling Asbestos provides the following descriptions with respect to asbestos:

“... asbestos is the term used to describe a group of naturally occurring fibrous mineral silicates. Asbestos is a hazardous material. Its fibres are extremely fine and can remain suspended in the air for hours; workers exposed to asbestos-contaminated air can inhale the fibres. If handled improperly, asbestos may cause serious chronic health problems and even death.”

“The ALARA principle governs worker exposure to asbestos – all exposure must be kept as low as reasonably achievable. Although the Regulation specifies exposure limits and action levels, every employer must further reduce or eliminate worker exposure if it can reasonably be done.”

British Columbia’s Occupational Health and Safety Regulation (“OHSR”)
OHSR contains legal requirements that must be met by all workplaces in British Columbia. As such, the University is mandated under OHSR to (i) promote occupational health and safety and (ii) protect workers and other persons present at the workplaces from work-related risks. Refer to Appendix E for a list of asbestos related sections of the regulation.

SFU Environmental Health and Research Safety (“EHRS”)
According to the University policy GP 17 regarding Occupational Health and Safety, EHRS provides programs and services designed to promote safe work practices and comply with regulatory requirements. As per the EHRS website, the Director of Occupational Health and Trades Safety is in charge of overseeing the occupational health and trades safety programs at the University including asbestos management. EHRS is further tasked with providing guidance to Facilities Services and ensuring that safe work procedures are properly followed when handling asbestos containing materials (2009-2011 AECP section 3.1.2 (a)/(b)/(c)/(e)/(f)).

Implications of Disturbing Ceiling Tiles Containing Asbestos in Strand Hall
The ceiling tiles containing asbestos in Strand Hall were the original ceiling tiles in place since the initial construction of the building in 1971. Based on test results, we understand that the ceiling tiles in Strand Hall 3000 level contain 1 to 3% amosite and chrysotile asbestos².

According to WorkSafeBC, any material containing more than 0.5% asbestos is considered hazardous. Additionally, WorkSafeBC categorizes these ceiling tiles as “friable”, which means there is a greater risk of exposure to asbestos fibres because it can be easily crumbled or powdered by hand pressure.

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² Based on Enviro-Vac’s Asbestos Exposure Control Plan dated August 5, 2016 on the abatement of ceiling tiles performed between August and October 2016
III. April 2016 incident

In April 2016, Facilities Operations engaged an external contractor, Western Mechanical Services Ltd. (“Contractor”), to perform HVAC work at Strand Hall 3000 level. Strand Hall 3000 level is where the President’s Office, VP Academic Office, VP Research Office, Faculty Relations and Financial Services are located. The Contractor removed ceiling tiles in order to gain access and troubleshoot the HVAC systems located above the ceiling tiles. Prior to the work, the Contractor was not informed of asbestos in the ceiling tiles in Strand Hall.

As per the Communication Notice dated April 25, 2016, issued by the Acting Chief Safety Officer, the Contractor performed work in the following office space:

<table>
<thead>
<tr>
<th>Department</th>
<th># of Rooms / Cubicles</th>
<th># of Building Occupants</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP Academic Office</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>VP Research Office</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Faculty Relations</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Financial Services</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Internal Audit</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>IT Services</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

On April 12, 2016, during regular office hours, the Contractor disturbed and apparently damaged some ceiling tiles containing asbestos inside an office and along the hallway as there was some white debris left on office furniture and the carpet. This demonstrates that the ceiling tile containing asbestos could be damaged due to its friable nature. After observing this, a building occupant contacted EHRS on April 13, 2016 (a day after the actual incident was first observed) who confirmed that a majority of ceiling tiles located at Strand Hall 3000 level contained asbestos. EHRS further issued a stop work order to the Contractor.

Following the April 2016 incident, EHRS issued a Communication Notice to Strand Hall building occupants and informed WorkSafeBC of the April 2016 incident. WorkSafeBC issued an inspection report and an order for the University to comply with. EHRS implemented corrective actions to address issues raised in the order. WorkSafeBC closed the order on June 30, 2016 indicating completion of action items requested. The ceiling tiles have now been removed between August and October 2016. See Appendix H for a summary of the asbestos abatement / remediation work.

IV. Past Incidents

Since the construction of Strand Hall in 1971, a number of major renovation projects and regular maintenance work required the Facilities tradespeople and external contractors to remove, replace, repair or reposition ceiling tiles. Ceiling tiles would need to be removed in order to gain access to equipment and systems in the area above the ceiling tiles. In addition, ceiling tiles have been cut
and replaced in certain areas. In some cases, it appears that safe work procedures were not followed when disturbing the ceiling tiles containing asbestos, as a result, the Facilities tradespeople, external contractors and building occupants inside the work zone may have been exposed to asbestos while the renovation and maintenance work were being done.

There have been a number of cases documented in TMA work orders and the East Administrative Joint Health & Safety Committee meeting minutes for the 2009/10 Financial Services renovation, where building occupants complained of dust or debris following regular maintenance work / renovation projects that disturbed the ceiling tiles containing asbestos. In such cases, janitorial staff were requested to perform the clean-up, or the building occupants cleaned off the debris themselves without proper clean-up and disposal procedures.

As noted previously in the Executive Summary section of this report, in April 2011, Facilities Development discovered the presence of asbestos in the ceiling tiles during a major renovation project at the Strand Hall 2000 level University Advancement area. Prior to this, our review of project documentation indicates that major renovation projects in Strand Hall, including the renovation of the Financial Services office in 2009/10, had been performed without employing safe work procedures when dealing with the ceiling tiles containing asbestos. Based on interviews with Strand Hall building occupants, the construction of the large meeting room (SH-3171) and its surrounding areas in the early 2000’s were also likely performed without safe work procedures when dealing with ceiling tiles containing asbestos. Following the discovery of asbestos, our review of project documentation indicates that all seven major renovation projects performed in Strand Hall employed safe work procedures. Nonetheless, regular maintenance work performed in Strand Hall involving ceiling tiles containing asbestos continued without employing safe work procedures until the April 2016 incident.

Based on available project documentation, we have documented a list of major renovation projects undertaken in the past 10 years. Refer to Appendix F for the list of major renovation projects in Strand Hall from January 2005 to April 2016.

In summary, we have identified the following regular maintenance work that resulted in potential exposure to asbestos between January 1, 2005 and April 26, 2016:

<table>
<thead>
<tr>
<th>Type of Work</th>
<th># of Work Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair / Replace / Reposition Ceiling Tiles</td>
<td>84</td>
</tr>
<tr>
<td>Office is Too Hot / Too Cold – Remove Ceiling Tiles to Check HVAC</td>
<td>42</td>
</tr>
<tr>
<td>Remove Ceiling Tiles to Repair HVAC</td>
<td>39</td>
</tr>
<tr>
<td>Repair Leaks in Ceiling Tiles</td>
<td>30</td>
</tr>
<tr>
<td>Check Ventilation – Remove Ceiling Tiles to Check HVAC</td>
<td>17</td>
</tr>
<tr>
<td>Clean Office / Ceiling Tiles</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total (Estimated)</strong></td>
<td><strong>220</strong></td>
</tr>
</tbody>
</table>
In the table below, we have separated the above work orders into two time periods – (a) Pre-April 2011 (before the discovery of ceiling tiles containing asbestos in Strand Hall) and (b) Post-April 2011 (after the discovery of ceiling tiles containing asbestos in Strand Hall). In our view, potential exposure to asbestos from regular maintenance work occurred post-April 2011 would have been prevented if the Facilities tradespeople and external contractors had been informed of asbestos in the ceiling tiles in Strand Hall.

<table>
<thead>
<tr>
<th>Time Period</th>
<th># of Work Orders</th>
<th># of Tradespeople and External Contractors Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Pre-April 2011</td>
<td>140</td>
<td>36</td>
</tr>
<tr>
<td>(b) Post-April 2011</td>
<td>80</td>
<td>31</td>
</tr>
<tr>
<td><strong>Total (Estimated)</strong></td>
<td><strong>220</strong></td>
<td><strong>220</strong></td>
</tr>
</tbody>
</table>

The table below shows the top 5 Facilities tradespeople who were potentially exposed to asbestos between January 1, 2005 and April 26, 2016 based on the highest total number of work orders for each time period.

<table>
<thead>
<tr>
<th>Top 5 Tradesperson with Highest Total # of Work Orders (numbers derived from the table above)</th>
<th>Time Period</th>
<th>Pre-April 2011</th>
<th>Post-April 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVAC Mechanic</td>
<td>38</td>
<td>Carpenter</td>
<td>22</td>
</tr>
<tr>
<td>Carpenter</td>
<td>33</td>
<td>HVAC Mechanic</td>
<td>16</td>
</tr>
<tr>
<td>Plumber</td>
<td>19</td>
<td>Plumber</td>
<td>10</td>
</tr>
<tr>
<td>HVAC Mechanic</td>
<td>15</td>
<td>HVAC Mechanic</td>
<td>8</td>
</tr>
<tr>
<td>Labourer</td>
<td>13</td>
<td>HVAC Mechanic</td>
<td>7</td>
</tr>
</tbody>
</table>

Following the April 2016 incident, some of the Strand Hall building occupants in the affected areas informed EHRS of the numerous past incidents where the Facilities Tradespeople and external contractors had disturbed the ceiling tiles containing asbestos without employing safe work procedures. We were further informed by EHRS that, in April 2016, EHRS had verbally notified the WorkSafeBC Officer that there were past incidents in Strand Hall involving potential asbestos exposure. When we spoke to the WorkSafeBC Officer in August 2016, the WorkSafeBC Officer indicated that she believed that the April 2016 situation was an isolated incident. After being informed that there were past incidents, the WorkSafeBC Officer stated that the University has no obligation to notify former employees and external contractors.

However, we also confirmed that WorkSafeBC was not notified of the specific safety issues surrounding the 2009/10 Financial Services renovation, nor were any statistical data with respect to pre-April 2016 regular maintenance work and pre-April 2011 major renovation projects provided to WorkSafeBC. We note that WorkSafeBC did not acknowledge, in their inspection report, any of the past incidents in Strand Hall involving potential asbestos exposure reported by EHRS.
We recommend that EHRS seek acknowledgement or documentation from WorkSafeBC on the verbal reporting of past incidents in Strand Hall involving potential exposure to asbestos including (i) the pre-April 2011 major renovation projects such as the 2009/10 Financial Services renovation; and (ii) the pre-April 2016 regular maintenance work disturbing the ceiling tiles containing asbestos where safe work procedures were not employed.

V. Detailed Observations and Recommendations

Based on our review, we believe the following are root causes which resulted in the incidents where the Facilities tradespeople and external contractors were unable to identify, communicate and safely deal with the ceiling tiles containing asbestos in Strand Hall, and culminating with the incident in April 2016. Following the April 2016 incident, with respect to the issues surrounding notifying affected individuals during the past incidents occurred in Strand Hall, we have provided recommendations to improve such notification (observation #1). For each root cause (observations #2 – 5), we have provided recommendations designed to strengthen and improve current practices so as to prevent such incidents from reoccurring.

1.1 Issue notification to Strand Hall building occupants [and Facilities tradespeople] regarding past incidents involving potential asbestos exposure in Strand Hall to clarify previous communications.

Shortly after the April 2016 incident, the Acting Chief Safety Officer issued a Communication Notice to Strand Hall building occupants explaining the April 2016 incident. Part of this Communication Notice included the following statement:

“... When previous renovations were performed in the building, the asbestos ceiling tiles were removed following safe work procedures. The open cubicle area in Finance and the main entrance area do not have asbestos-containing ceiling tiles.”

Based on project documentation which we reviewed, the ceiling tiles containing asbestos in the now open cubicle area in Financial Services were replaced during the 2009/10 Financial Services renovation. As such, the above statement implied that the 2009/10 Financial Services renovation was done following safe work procedures. However, based on our review of project documentation from the renovation and discussions with the Facilities Development management and Strand Hall building occupants, we conclude that no such safe work procedure was followed when removing the ceiling tiles containing asbestos during the 2009/10 Financial Services renovation. In fact, as previously indicated in the Past Incidents section of this report, it was not until April 2011, that major renovation projects started employing safe work procedures to deal with ceiling tiles containing asbestos.

In addition, the remaining portion of the Communication Notice did not adequately address the fact that the April 2016 situation was not an isolated incident and that the regular maintenance work...
that disturbed the ceiling tiles containing asbestos prior to April 2016 was done without employing safe work procedures, thereby potentially releasing asbestos during such work.

By omitting the possibility of potential release of asbestos during the 2009/10 Financial Services renovation and the regular maintenance work prior to April 2016, it is conceivable that the readers would form an opinion that there were no other reasons to be concerned about potential exposure to asbestos in Strand Hall resulting in under-reported registration at the WorkSafeBC Exposure Registry.

**Recommendation**
EHRS should provide a notice to Strand Hall building occupants to revise the April 25, 2016 Communication Notice with respect to the statement that ‘when previous renovations were performed in the building, the asbestos ceiling tiles were removed following safe work procedures’. In our opinion, this statement is overly broad and a communication should be issued that accurately reflects the fact that some renovation work and regular maintenance work involving ceiling tiles containing asbestos prior to the April 2016 incident, for example the 2009/10 Financial Services renovation, were likely performed without following safe work procedures.

The notice should remind building occupants [and Facilities tradespeople] to register on the WorkSafeBC Exposure Registry.

**1.2 Notification to former Facilities tradespeople, external contractors and Strand Hall building occupants on past incidents involving potential asbestos exposure in Strand Hall has not been given**

Based on our review, we feel there is a possibility that former Facilities tradespeople, current / former external contractors and former Strand Hall building occupants may have been exposed to asbestos when ceiling tiles containing asbestos in Strand Hall were disturbed without employing safe work procedures during the pre-April 2011 major renovation projects and the pre-April 2016 regular maintenance work. These individuals may have to be notified of these past incidents involving potential asbestos exposure in Strand Hall.

**Recommendation**
We recommend that EHRS seek legal advice to determine whether the following groups should be notified:

- former Facilities tradespeople who performed work that involved disturbance of ceiling tiles containing asbestos in Strand Hall. For example, we identified 33 incidents of potential asbestos exposure by a carpenter between January 1, 2005 and July 31, 2011 (his retirement date).

- Current / former external contractors who performed work that involved disturbance of ceiling tiles containing asbestos in Strand Hall.
• former Strand Hall building occupants who (i) stayed inside the work zone where Facilities tradespeople or external contractors disturbed the ceiling tiles containing asbestos or (ii) they inadvertently disturbed the ceiling tiles containing asbestos (e.g. pushing pins or nails in the ceiling tiles to hang Halloween / Christmas decorations).

Also, all parties should be made aware of the WorkSafeBC Exposure Registry.

2. Facilities Operations management might not be aware of specifics of how ceiling tiles containing asbestos are handled by the Facilities tradespeople and external contractors at worksites in Strand Hall

Based on our interviews, it is commonly known to Facilities Operations management that, for Strand Hall, a majority of HVAC, plumbing and electrical systems are located above the ceiling tiles. However, we noted that Facilities Operations management was not aware that working with ceiling tiles necessarily involved removing, replacing, repairing and repositioning ceiling tiles and that this could result in parts of the ceiling tiles being damaged. Without any safety precautions being taken by the Facilities tradespeople and external contractors, each regular maintenance work order represents a potential instance of the ceiling tiles being disturbed, resulting in asbestos being potentially released, and Facilities tradespeople, external contractors and building occupants may have been exposed to asbestos. In fact, many ceiling tiles found at Strand Hall 3000 level appear to have holes and edges chipped off. Refer to Appendix G for the photos showing damage to the edges and corners of ceiling tiles containing asbestos at the Strand Hall 3000 level.

According to the 2009-2011 AECP section 3.1.1 (b), the Asbestos Project Coordinator at Facilities Services is responsible for “monitoring the condition of asbestos containing materials throughout the building and damaged or deteriorated asbestos containing materials must be promptly removed, enclosed or encapsulated to prevent the release of airborne asbestos fibres”. This responsibility was later assigned to the Facilities Operations Senior Technologist in May 2012 as per the 2012-2016 AECP section 4.1.2 (a).

Despite the AECP guideline, even after being made aware of asbestos in the ceiling tiles in Strand Hall during the period of September and December 2015, Facilities Operations management did not do any site visit in Strand Hall to assess and evaluate the condition of the ceiling tiles containing asbestos. We note that a site visit or a cursory observation of the many ceiling tiles with some form of damage could have indicated that there is a potential risk of exposure to asbestos in Strand Hall.

Consequently, the Facilities tradespeople and external contractors were not given instructions from Facilities Operations management to immediately halt handling the ceiling tiles containing asbestos in Strand Hall as required by the AECP.
Recommendation
We recommend that Facilities Services management, assisted by EHRS, periodically select a sample of regular maintenance work orders that require working with asbestos materials and perform site inspection or ride-along following a Facilities tradesperson or an external contractor with the goal to ensure that safe work practices are followed in accordance with the AECP at the worksite. Any non-compliance must be addressed on site by direct interaction with the Facilities tradespeople or the external contractors followed by a report detailing the circumstances and reasons for such non-compliance.

3.1 There is a gap in communication and coordination within Facilities Services involving the ceiling tiles containing asbestos in Strand Hall

Between Facilities Operations management and Facilities tradespeople
We reviewed the monthly Facilities Services Safety Committee minutes from September 2015 to April 2016, where the presence of asbestos in ceiling tiles in Strand Hall was discussed among EHRS and the Facilities Operations management. However, Facilities Operations management neither communicated this asbestos warning to Facilities tradespeople and external contractors nor gave instructions to Facilities tradespeople and external contractors to immediately halt handling the affected ceiling tiles containing asbestos in Strand Hall. This resulted in potential exposure to asbestos by Facilities tradespeople and external contractors between September 2015 and April 2016. We were informed that, at the time, Facilities Operations management exclusively relied on the training, labelling, and TMA work orders for notification of the ceiling tiles containing asbestos to the Facilities tradespeople and external contractors. Nevertheless, in Strand Hall, the ceiling tiles containing asbestos were not labelled and the required asbestos warning regarding the ceiling tiles containing asbestos was not on the TMA work orders.

Among Facilities tradespeople
There appears to be miscommunication at the Facilities tradespeople level, where safety issues and asbestos warnings from one group to another are not properly communicated. Our discussions with five Facilities tradespeople from the carpentry, labourer, plumbing and HVAC shops concluded that, other than two individuals, none of the other people were made aware of asbestos in the ceiling tiles in Strand Hall until after the April 2016 incident. With respect to the two individuals that were aware of asbestos, following their awareness of asbestos in the ceiling tiles, they did not further communicate with other Facilities tradespeople who inadvertently completed their work without following safe work procedures.

Between Facilities Development and Facilities Operations
Furthermore, after April 2011, while Facilities Development and their external contractors did employ safe work procedures when working with ceiling tiles containing asbestos during major renovation projects in Strand Hall, this asbestos warning was not shared with the Facilities tradespeople from Facilities Operations who continued their regular maintenance work with ceiling
tiles containing asbestos in Strand Hall without employing safe work procedures up until the April 2016 incident.

**Recommendation**

It is our view that effective communication within Facilities Services involving the presence of asbestos in the ceiling tiles in Strand Hall would have minimized the potential asbestos exposure between April 2011 and April 2016 for regular maintenance work.

Knowledge transfer of information from the Facilities Development team (for the 2011 University Advancement renovation) to the Facilities Operations team as to the presence of asbestos in the ceiling tiles could have been a safeguard that prevented the incidents involving potential asbestos exposure between April 2011 and April 2016. As a first step, we recommend that the monthly meetings by the Facilities Services Safety Committee include representatives from both Facilities Development and Facilities Operations, in order to improve sharing of information regarding asbestos materials and other safety concerns between the two groups. These representatives should have a mandate to communicate the items of discussion to their co-workers.

### 3.2 There is a gap in communication and follow-up between EHRS and Facilities Operations involving the ceiling tiles containing asbestos in Strand Hall

Below are some examples that demonstrate a gap in communication between EHRS and Facilities Operations.

- We were informed by EHRS that Facilities Operations Superintendents had been made aware by EHRS of the presence of asbestos in ceiling tiles in Strand Hall as early as in April 2011. However, this was not confirmed in interviews with all three Superintendents.

- We were informed by EHRS that the existence of the WorkSafeBC Exposure Registry for reporting of potential asbestos exposure from past incidents was communicated to the Facilities tradespeople through the Toolbox Talks at Facilities Operations following the April 2016 incident. However, during our interviews, two Facilities tradespeople from the carpentry shop and one Facilities tradesperson from the labourer shop advised that they did not receive any such communication. Since attendance was not taken at the Toolbox Talks, it is difficult to identify who has received the message.

**Recommendation**

EHRS should follow-up to ensure that their messages and communications are properly received and understood by intended recipients. We recommend that EHRS attend the Toolbox Talks and take attendance. For Facilities tradespeople who missed the Toolbox Talks, EHRS should brief these individuals on safety issues and asbestos warning.
3.3 There is a gap in interpretation of the absence of asbestos labels by IT Services

According to the 2009-2016 AECP, ‘all asbestos containing materials must be clearly labelled, where practicable ... Those materials not labelled or identified otherwise, shall be considered asbestos containing until analysis of the suspect material determines otherwise.’

Prior to clarification by EHRS in late April 2016, the Director of IT Network Services indicated that there was an assumption among his staff that ‘unsafe ceiling tiles on campus are marked, leading to the assumption that if there is no labeling then the area should be safe.’

We noted that the ceiling tiles containing asbestos at Strand Hall 3000 level were not labelled prior to the April 2016 incident. Also, IT Services has no access to the TMA system, and therefore would not be able to receive any warning on asbestos containing materials on the Burnaby campus. With the misunderstanding that ceiling tiles with no label are safe, there is a possibility for IT Services employees and their external contractors to have unknowingly disturbed the ceiling tiles containing asbestos at Strand Hall 3000 level prior to the April 2016 incident.

**Recommendation**

EHRS should follow-up to ensure that all relevant stakeholders (e.g. Facilities Services, IT Services, and their external contractors) are aware of and understand the terms in AECP.

Since IT Services has no access to TMA and not all asbestos containing materials are labelled, EHRS should work with IT Services to identify alternate methods of communication so IT Services employees and their external contractors will be able to identify the presence of asbestos containing materials on the Burnaby campus.

4.1 There is a gap in compliance with the AECP – ceiling tiles containing asbestos in Strand Hall were not labelled

According to the 2009-2011 AECP section 3.1.2 (b), EHRS is responsible for “inform[ing] building occupants and maintenance personnel as well as contracted trades, about the presence and location of asbestos containing materials [through] the tagging and identification system”.

EHRS has a labelling system for materials containing asbestos where such materials are labelled, except for areas such as drywall or floor tiles. However, from April 2011 (when the initial discovery of asbestos was made) until the April 2016 incident, the ceiling tiles containing asbestos in Strand Hall were not labelled.

In our view, labelling under the AECP not only identifies the presence of asbestos but also assists in dealing with emergency and unplanned maintenance work situations when Facilities tradespeople are dispatched directly without receiving a TMA work order, and therefore not have the TMA
asbestos containing materials warning page. External contractors hired directly by IT Network Services also do not receive a TMA work order (nor do they have access to the TMA system) and may unknowingly disturb ceiling tiles containing asbestos while accessing the network cables above the ceiling tiles. Proper labelling is used to notify Facilities tradespeople, external contractors and building occupants of the existence and location of asbestos containing materials.

Inadequate labelling of the ceiling tiles containing asbestos was identified as a contributing factor from the WorkSafeBC inspection notes regarding the April 2016 incident. We noted that labelling was subsequently completed on the ceiling tiles containing asbestos at Strand Hall 3000 level at the end of April 2016.

**Recommendation**

We recommend that EHRS verify that all materials containing asbestos identified in the EHRS Asbestos Inventory has been completely and adequately labelled. All asbestos containing materials should be appropriately labelled as soon as possible. The onus is on EHRS to ensure that labelling is done immediately and appropriately. Where labelling is impractical, EHRS should ensure that these exceptions are documented and that alternate methods of communication or notification are readily available and understood by Facilities tradespeople and external contractors.

In addition, we recommend that EHRS review the quality of existing labels to ensure they are clearly readable and visible (e.g. not faded), and that labels are within a reasonable distance and location to ensure they can be easily spotted by Facilities tradespeople, external contractors and building occupants.

4.2 **There is a gap in compliance with the AECP – EHRS did not follow up to ensure that the asbestos warning regarding the ceiling tiles containing asbestos in Strand Hall is on TMA work orders**

According to the 2009-2011 AECP section 3.1.2 (a), EHRS is responsible for “ensur[ing] that the location of asbestos containing materials and presence of suspected asbestos containing materials are documented in TMA”.

The TMA system used by Facilities Services to generate work orders is linked to the EHRS Asbestos Inventory, but the asbestos update in the TMA system is not automatic, as it requires EHRS to perform specific export procedures to update the TMA system each time. When maintenance work is required in a room listed on the EHRS Asbestos Inventory as having materials containing asbestos, TMA is designed to produce an asbestos-containing materials warning page for that work order. Facilities tradespeople rely on the TMA work orders for notification of asbestos-containing materials so that appropriate safety measures can be taken. However, during the five years from April 2011 (the initial discovery of ceiling tiles containing asbestos in Strand Hall) until the April 2016 incident, EHRS did not follow up to ensure that the asbestos warning regarding the ceiling...
tiles containing asbestos in Strand Hall was on the TMA work orders. In fact, the TMA work orders did not contain such warning. A simple follow-up such as reviewing a sample of TMA work orders would have identified such error.

Absence of warning from TMA work orders regarding ceiling tiles containing asbestos was identified as a contributing factor from the WorkSafeBC inspection notes regarding the April 2016 incident. During our interview in August 2016, the Director of Occupational Health and Trades Safety at EHRS informed us that the TMA work orders included the asbestos warning regarding the ceiling tiles containing asbestos in Strand Hall. As part of our review procedures, in September 2016, we reviewed a sample of TMA work orders and noted that the asbestos warning was still absent, which we brought to the attention of EHRS. It was not until October 2016, we verified through reviewing another sample of TMA work orders that this issue has now been addressed so that the TMA work order now includes all asbestos warnings regarding materials containing asbestos identified in the EHRS Asbestos Inventory.

**Recommendation**

We recommend that EHRS periodically review a sample of TMA work orders to ensure that the asbestos warnings on the TMA work orders match with the EHRS Asbestos Inventory information. This review helps to verify that accurate and complete asbestos warnings is printed on all TMA work orders where required.

5. **The asbestos consultant did not identify the ceiling tiles containing asbestos in Strand Hall during its re-inspection**

EHRS maintains an Asbestos Inventory which documents, room-by-room, the presence of asbestos on Burnaby campus. This Asbestos Inventory was initially created in 1982 (the Asbestos Inventory for Strand Hall was created in 1991) and is currently maintained and updated by EHRS as materials containing asbestos is removed or newly identified on Burnaby campus. On a periodic basis, a qualified asbestos consultant is hired to re-inspect the campus to provide a refresh of the Asbestos Inventory. The last re-inspection was performed in 2008 by the current asbestos consultant, who has been providing asbestos consultant services to the University since 2007.

The current asbestos consultant did not identify the ceiling tiles containing asbestos in Strand Hall in its 2008 asbestos re-inspection, even though in light of the age of the building, ceiling tiles should have been examined.

**Recommendation**

We recommend EHRS and Facilities Services replace the current asbestos consultant with an alternate qualified asbestos consultant, who can provide a fresh set of eyes for the next Asbestos Inventory re-inspection. Re-inspection should entail a complete identification and inventory of asbestos materials on Burnaby campus. While we understand that it may not be feasible to identify
all materials containing asbestos, EHRS should ensure that such inspection process and scope are fully understood by EHRS and are designed to maximize the discovery of any other unknown asbestos materials on Burnaby campus.

In addition, we recommend that EHRS increase the frequency of its re-inspections. The last re-inspection was performed in 2008, with the next one planned for 2016. More regular re-inspections may increase the chances of identifying materials containing asbestos.
APPENDIX A – Photos from the April 2016 Incident at Strand Hall (“SH”)

Photo 1: Ceiling tiles containing asbestos moved by the Contractor (photo taken 04/14/2016)

Photo 2: Damage to ceiling tile containing asbestos by the Contractor outside SH-3155 (photo taken 04/13/2016)
Photo 3: White debris identified in the hallway carpet outside SH-3155 (photo taken 04/13/2016)
APPENDIX B – Internal Audit Detailed Procedures

The objective of this review was to obtain an understanding and document the April 2016 incident and past incidents, to determine contributing factors in order to provide recommendations for future improvements. To perform the review, we conducted the following:

- reviewed WorkSafeBC publications, guidelines and regulations relating to asbestos
- reviewed University policy GP17 regarding Occupational Health and Safety
- reviewed EHRS policies and procedures regarding the management of asbestos
- reviewed a listing of maintenance work orders recorded in TMA between January 1, 2005 and April 26, 2016 to quantify the number of work orders which involved the handling of ceiling tiles containing asbestos in Strand Hall
- reviewed a listing of major renovation projects performed at Strand Hall between January 1, 2005 and April 26, 2016 to determine whether safe work procedures were followed on projects where disturbance of ceiling tiles containing asbestos was required
- reviewed meeting minutes from the Facilities Services Health & Safety Committee, Central University Health & Safety Committee, East Administrative Joint Safety Committee, and AQ/Strand Hall Health & Safety Committees between January 2010 and July 2016
- interviewed:
  - Senior Director, Environmental Health & Research Safety (on April 21, 2016)
  - Director, Occupational Health and Trades Safety (on June 23, August 17 & September 29, 2016)
  - Program Manager, Environmental & Safety Management Systems (on September 29, 2016)
  - Director, Maintenance and Operations (on June 23, 2016)
  - Manager, Project Services (on August 25 & November 21, 2016)
  - Supervisor, Client Services (on June 23 & July 19, 2016)
  - Building Technologist, Client Services (on July 19 & October 13, 2016)
  - Superintendent, Building & Grounds (September 19, 2016)
  - Civil Trades Manager, Building & Grounds (on August 16, 2016)
  - Superintendent, Electrical (on November 18, 2016)
  - Superintendent, Mechanical (on November 18, 21 & 25, 2016)
  - Assistant Superintendent, Mechanical (on November 25, 2016)
  - Energy Manager (December 13, 2016)
  - Energy Specialist (December 13, 2016)
  - TMA Systems Manager (June 9 & September 20, 2016)
  - Manager, Central Receiving FM Stores (September 6, 2016)
  - Tradespeople of the Facilities Services Carpentry shop (on August 3 & 30, 2016), HVAC shop (on August 4 & November 17, 2016), Plumbing shop (on August 16, 2016) and Laborer shop (on August 11, 2016)
  - Project Manager, IT Network Services (on December 8, 2016)
  - Strand Hall building occupants
APPENDIX C – Photos from the 2009/10 Financial Services Renovation

Photo 1: Building occupant sitting at the desk inside the construction zone during the renovation. There is a stack of ceiling tiles containing asbestos behind the individual (photo taken 01/22/2010).

Photo 2: Photo enlargement of ceiling tiles containing asbestos from Photo 1
Photo 3: Open area during the renovation (photo taken 01/22/2010)

Photo 4: Open area during the renovation (photo taken 01/22/2010)
Photo 5: Light-weight plastic sheeting separating project and non-project work areas (note: this barrier is not sufficiently containing the debris from the renovation, including ceiling tile debris) (photo taken 12/22/2009)

Photo 6: Light-weight plastic sheeting separating project and non-project work areas (photo taken 12/22/2009)

Photo 7: Light-weight plastic sheeting separating project and non-project work areas (photo taken 12/22/2009)

On April 19, 2016, WorkSafeBC officer Percy Chua (Occupational Hygiene Officer - this officer) attended this workplace and met with Director of Facilities Services; Supervisor, Client Services in Facility Services; Energy Manager, Facilities Services; Senior Director, Environmental Health & Research Safety; Director of Occupational Health & Trades Safety, Environmental Health and Research Safety; and a worker representative. The purpose of the site visit was an incident involving improper handling of asbestos containing material.

Background

Strand Hall, 3000 Level contains asbestos-containing ceiling tile. A third-party contractor was performing ventilation work within this area. Work activities involved lifting ceiling tiles to access the ventilation units. Various ceiling spaces were accessed, which included 9 offices, 2 photocopy rooms, 1 storage room and 1 open office space. Work was performed over duration of two weeks.

Actions Taken and Discussion

The following issues were observed and discussed with the representatives during the inspection:

a. Ventilation work performed by the contractor has stopped. No further work will be done until the asbestos within the ceiling tiles have been abated and removed. Plans to replace the ceiling tiles in Strand Hall have been in progress for the past few months, but have run into logistic issues.

b. Sure Hazmat performed visual inspection and air sampling of the affected areas immediately after stopping work. Minor debris was found on surfaces. Air sampling results of the affected areas were below the allowable exposure limit.

c. Facilities Services Project Managers are responsible for communicating hazards to third-party contractors. Project Managers are notified of asbestos and other hazardous materials within buildings via internal work order and asbestos inventory (through the TMA system). Program Managers are also responsible for coordinating and orienting third-party contractors to the campus and work site prior to work activities starting.

d. A contributing factor identified in the preliminary incident investigation was the ceiling tiles were not labeled as asbestos-containing material. At the time of inspection, another contributing factor was identified: the limitations of the TMA system to accurately pin-point particular locations of ACM (for example, in a hallway or in a transitional area). Within the TMA system, a general notification of ACM within transitional areas is printed when there are any building maintenance activities within the building. TMA system messages are not given to third-party contractors. The responsibility of communicating hazards within the TMA work orders are the Project Managers.

e. An update of the campus asbestos inventory is targeted for Fall 2016. This will involve reviewing and/or re-surveying asbestos currently identified in the inventory.

Next Steps

One order is issued at this time. The employer shall provide written assurance that the identified deficiencies have been corrected. The employer shall also provide a written Notice of Compliance to WorkSafeBC, and must specify:

a. what has been done to comply with the orders, and

b. if compliance has not been achieved at the time of the report, a plan of what will be done to comply and when compliance will be achieved by May 6, 2016.
APPENDIX E – WorkSafeBC Regulations on Asbestos

**Occupational Health and Safety Regulation ("OHSR")**
The University is regulated under OHSR. Below is the listing of OHSR sections which relate to asbestos in the workplace:

- Section 5.2 – General information requirement
- Section 5.48 - 5.59 – Controlling exposure
- Guideline G5.53 - 5.54 – Occupational hygiene methods acceptable to WorkSafeBC
- Section 6.1 - 6.32 – Asbestos
- Guidelines G6.1 - 6.32 – Asbestos
- Section 20.2 – Notice of Project
- Guideline G20.2 (1)(c) – Notice of project for asbestos – ongoing work
- Section 20.112 – Hazardous materials (demolition)
- Guideline 20.112 – Hazardous materials – asbestos

In addition, WorkSafeBC has produced a guide on “Safe Work Practices for Handling Asbestos”. This guide provides information about asbestos and assists consultants and employers in developing suitable work procedures.
APPENDIX F – Major Renovation Projects at Strand Hall (January 2005 – April 2016)

We have documented a timeline below of major renovation projects at Strand Hall 1000 – 3000 levels that involved the disturbance of ceiling tiles containing asbestos from January 1, 2005 to April 26, 2016.

- project where safe work procedures were not employed
- project where safe work procedures were employed

* Note that the above was compiled based on available project documentations between January 1, 2005 and April 26, 2016. Projects involving disturbance of ceiling tiles containing asbestos before 2005 could not be shown here due to unavailability of complete project documentation.
APPENDIX G – Photos of Damaged Ceiling Tiles Containing Asbestos at Strand Hall 3000 Level

Photo 1: Hallway outside SH-3151 (photo taken 09/22/2016)

Photo 2: Hallway outside SH-3153 (photo taken 09/22/2016)
Photo 3: Hallway outside SH-3162 (photo taken 06/13/2016)

Photo 4: SH 3000 level general area (photo taken 04/26/2016)
Photo 5: SH-3150 (photo taken 04/13/2016)

Photo 6: SH-3150 (photo taken 04/13/2016)
Photo 7: SH-3151 (photo taken 09/22/2016)

Photo 8: SH-3151 (photo taken 04/14/2016)
Photo 9: SH-3154 (photo taken 09/22/2016)

Photo 10: SH-3154 (photo taken 09/22/2016)
APPENDIX H – Strand Hall 3000 Level Ceiling Tile Replacement Project
(Project #304359)

In August 2016, the project to replace the ceiling tiles containing asbestos from Strand Hall 3000 level was started and scheduled for completion in October 2016. A multi-staged approach was taken to span approximately 7 to 8 weeks with work starting at the end of business hours on Fridays and concluding prior to Monday morning. Work would be performed in a section-by-section approach. Management had recommended and approved this option as it requires the least disturbance to clients and University services. Enviro-Vac, the contractor responsible for removing the asbestos containing ceiling tiles, had rated the activity of moderate risk.

The following contractors were engaged:

<table>
<thead>
<tr>
<th>Contractor Name</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enviro-Vac</td>
<td>Abatement of ceiling tiles containing asbestos on Strand Hall 3000 level</td>
</tr>
<tr>
<td>Sure Hazmat &amp; Testing</td>
<td>Air monitoring and documentation</td>
</tr>
<tr>
<td>Holaco Construction</td>
<td>Installation of new ceiling tiles after asbestos abatement</td>
</tr>
</tbody>
</table>

Based on our review of project documentation and discussion with key project staff, we did not have concerns regarding the project to ensure that safe work procedures were taken to ensure compliance with WorkSafeBC regulations and University policies. The review of project documentation included the review of the detailed work procedures and the site specific risk assessment form that documents the asbestos exposure control plan provided by Enviro-Vac.
Photo 1: Heavy weight protective sheeting over walls, workstations and floor. No staff members were working in the area. Project work was performed after hours over the weekend.

Photo 2: Heavy weight protective sheeting over walls, workstations and floor. No staff members were working in the area. Project work was performed after hours over the weekend.
Photo 3: Protective sheeting over windows and air vent

Photo 4: Example of personal protective equipment (mask and suit) used during replacement project
Photo 5: Negative air machine used during ceiling tile removal work

Photo 6: Protective sheeting over shelves

Photo 7: Protective sheeting separating project and non-project work areas