Cranbrook School

Cranbrook School - Hazardous Materials Survey and Management Plan

3 June 2013

PARSONS BRINCKERHOFF

Document information
Client: Cranbrook School Title: Cranbrook School - Hazardous Materials Survey and Management Plan Document No: 2189256A-HAZ-HMP-001 RevB Date: 3 June 2013

Rev	Date	Details
A	12/05/2013	Original
B	12/05/2013	Updated Register

Author, Reviewer and Approver details			
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Glossary

Acronym	Definition
A	Amosite asbestos (brown asbestos)
AC	Asbestos cement (asbestos containing fibrous cement material)
ACM	Asbestos Containing Material
AS 1216	Standards Association of Australia, Classification and Class Labels for Dangerous Goods
AS 1319	Standards Association of Australia, Rules for the Design and Use of Safety Signs for the Occupational Environment
AS 1715	Standards Association of Australia, Selection, Use and Maintenance of Respiratory Protective Devices
AS 1716	Standards Association of Australia, Respiratory Protective Devices
ASCC	Australian Safety & Compensation Council
C	Crocidolite Asbestos (blue asbestos)
CH	Chrysotile Asbestos (white asbestos)
DECC	Department of Environment and Climate Change (formerly NSW EPA)
EPA	Environment Protection Authority
Fibres/mL	Countable Fibre per Millilitre of Air Sampled
FC	Fibre Cement (usually sheeting)
L/min	Litres per minute of air
NAD	No Asbestos Detected
NATA	National Association of Testing Authorities, Australia
NOHSC	National Occupational Health and Safety Commission
PAM	Presumed asbestos material
PCB	Polychlorinated Biphenyls
PPE	Personal Protective Equipment
RPE	Respiratory Protective Equipment
SMF	Synthetic Mineral Fibre

Executive summary

In April 2012, Parsons Brinckerhoff was commissioned by Cranbrook School to undertake a Hazardous Materials survey to identify and conduct risk assessments of the hazardous materials identified within all buildings located at its Rosebay Senior School Campus.

This report provides a summary of the methodology, references, purpose, scope of works and management requirements of the identified hazardous materials.

The hazardous materials survey of the school buildings was carried out by Parsons Brinckerhoff surveyors, John Batty and Ryan Straub during the 2013 Term 1 School Holidays between 15 – 24 April 2013.

The scope of services for this investigation comprised a detailed visual inspection of the school buildings where accessible. Representative samples were collected from materials suspected of containing asbestos and paint systems suspected of containing lead. All data generated from the survey was used to create hazardous materials registers for each building (Appendix A).

The buildings were found to contain asbestos containing materials (ACM), lead based paint systems, lead containing dust and synthetic mineral fibre (SMF) material with some of these materials noted to be in poor to fair condition potentially posing a medium risk to the health of the students, staff and contractors at the school.

Medium risk ACM was identified within the Senior School Building (009) Level 1 balcony 1.26 and to the north elevations balconies of the Mansfield Building (012) in the form of heavily weathered asbestos bituminous membrane covering the floor. As fibres were visible at the time of inspection it is recommended that access to this area is restricted until the material can either be removed or encapsulated. It is recommended that the remediation works are undertaken within 6 months.

Medium risk ACM was identified within the Bishop Building (010) level 1 store and void space in the form of a damaged redundant moulded asbestos resinous pipe. As the pipe was damaged debris was identified on the ground surface and surrounding area. It is recommended that the redundant pipe and debris be removed and the surrounding area decontaminated. A redundant copper pipe was found within the void wrapped in asbestos rope that should also be removed. It is recommended that the remediation works are undertaken within 6 months.

Medium risk ACM was identified within the Mansfield Building (012) Level 2 Studio 3 – 2.5 in the form of a compressed asbestos cement bench top. The bench top appeared to be in a good condition however as the bench is utilised for art works and the bench top may be inadvertently disturbed during normal activity it is recommended that the bench top is removed and replaced. It is recommended that the remediation works are undertaken within 3 months.

Medium risk ACM was identified within the Perkins Building (013) foundation space below offices 1.3 & 1.4 in the form of asbestos cement sheeting debris. It appears as though the sheeting to the exterior of this building has been damaged in the past with asbestos cement debris being generated within the foundation space. Access to the area should be restricted and the material removed and the surrounding area decontaminated. It is recommended that the remediation works are undertaken within 6 months.

Medium risk ACM was identified within the John Saunders Pavilion, canteen ceiling space in the form of asbestos contaminated dust. It appears that this has been generated during past works on the asbestos cement ceiling lining in the area. It is recommended that the ceiling space is decontaminated with HEPA type vacuums and the area sealed with a PVA solution following clearance inspection. It is recommended that the remediation works are undertaken within 3 months.

Medium risk lead contaminated dust was identified within the Foundation Building (005), level 1 ceiling space of the foundation office 2.8. It is recommended that the ceiling space is decontaminated with HEPA type vacuums and the area sealed with a PVA solution following clearance inspection. It is recommended that the remediation works are undertaken within 6 months.

All other asbestos containing material identified were found to be in a good to fair condition posing a low risk to occupants if managed in accordance with recommendations within this document.

All lead based paint systems and SMF materials identified within the site have been found to be generally in a good condition and pose a low risk to staff and visitors of the site.

The light fittings could not be inspected closely due to electrical hazards and height restrictions. Parsons Brinckerhoff presume that the light fittings contain polychlorinated biphenyls (PCBs) containing capacitors until they can be inspected at a later date.

Details of all hazardous materials identified are presented within the registers in Appendix A.

The remediation of all asbestos containing materials should be undertaken in accordance with the requirements of the Safe Work Australia How to Safely Remove Asbestos, Code of Practice 2011, and undertaken by a licenced asbestos removal contractor under the direction of an licenced asbestos assessor such as can be provided by Parsons Brinckerhoff.

This management plan and register must be reviewed at least every five years or when requested by a health and safety representative or when asbestos is removed, disturbed, sealed or enclosed or when changes to a control measure are made or when the plan is no longer adequate. This should be undertaken in accordance with the Safe Work Australia How to Manage and Control Asbestos in the Workplace, Code of Practice 2011

1. Introduction

In April 2012, Parsons Brinckerhoff was commissioned by Cranbrook School to undertake a Hazardous Materials survey to identify and conduct risk assessments of the hazardous materials identified within all buildings located at its Rosebay Senior School Campus.

The term hazardous materials refer to the following:

- Asbestos containing materials (ACM);
- Lead based paints;
- Lead contaminated dust
- Synthetic Mineral Fibre (SMF) material; and
- Light fittings that may contain polychlorinated biphenyls (PCB) capacitors.

This report provides a summary of the methodology, references, purpose, scope of works and management requirements of the identified hazardous materials.

A complete list of the in-situ and suspected Asbestos Containing Materials (ACM), lead based paint systems, lead contaminated dust and Synthetic Mineral Fibre (SMF) materials identified during the survey, including details about the condition and the risk posed by each situation, have been provided in the hazardous materials register found in Appendix A with supplementary information provided in Appendix C – Q photographs, and Appendix B certificates of analysis.

This Report also provides recommendations for the ongoing management of the identified hazardous materials and complies with requirements for an asbestos management plan as detailed within the NSW Work Health and Safety Regulations 2011.

No one section or part of a section of this Report should be taken as giving an overall idea of this Report. Each section must be read in conjunction with the whole of this Report, including the hazardous materials registers and sample results.

All data generated from the survey was used to create an hazardous materials register. This Report also addresses control priority and control recommendations and provides consideration to removal priority.

1.1 Legislative requirements

The survey works and production of this report have been undertaken in accordance with the requirements of the following documents:

- NSW: Work Health and Safety Act 2011
- NSW: Work Health and Safety Regulations 2011
- Safe Work Australia: How to Manage and Control Asbestos in the Workplace: Code of Practice 2011
- Safe Work Australia: How to Safely Remove Asbestos: Code of Practice 2011
- ANZECC, 1997. Identification of PCB-Containing Capacitors
- Polychlorinated Biphenyls Management Plan Revised Edition April 2003
- Australian Standard AS4361.1, 1995. Guide to Lead Paint Management Part 1: Industrial applications

- Australian Standard AS4361.2, 1998, Guide to Lead Paint Management Part 2: Residential and Commercial Buildings
- NOHSC, June 1989. Technical Report on Synthetic Mineral Fibres.

1.2 Objectives

The objective of the hazardous materials survey was to:

- identify hazardous materials;
- provide a qualitative risk assessment of the hazardous materials identified
- provide recommendations on the control measure strategies
- prepare a hazardous materials register for the buildings onsite to ensure compliance with NSW legislation, Commonwealth codes of practices and Australian Standards as outlined in Section 1.1 above.

1.3 Scope of work

The completed scope of services for this investigation comprised the following:

Task 1 – Pre-site inspection preparation

- Preparation of a project specific Health Environment and Safety Plan (HESP).

Task 2 – Site inspection and sample collection

- Site investigations, includes identification of hazardous materials, location, type, condition, extent and qualitative risk assessment.
- Sampling of representative materials suspected of containing asbestos or lead materials. Suspected PCBs and SMF containing items or materials were assessed on site by the surveyors.

Task 3 – Analysis of suspect materials

- Suspected ACM and lead based paint samples collected during the survey were sent to NATA accredited laboratories for analysis.

Task 4 – Reporting & Hazardous Materials Register

- All data generated from the survey was used to create a hazardous materials register/spread sheet, which identifies and defines the condition of the materials, lists any factual findings and provides consideration to their management or removal priority.

1.4 Responsibilities

A copy of this Report will be kept on site at all times and provided to any contractor who may work onsite. Responsibilities are outlined in Table 1-1 below.

Table 1-1 Summary of Responsibilities

Position/ Organisation	Reports to	Summary of Responsibilities
Cranbrook	Regulatory Agencies (as required)	Engage Principal Contractor and/or Occupational Hygiene Consultant. Provide funding and approvals. Review documentation provided by the Principal Contractor. Review hazardous materials register, hazardous materials management plans (HMMP) and any safety documentation prepared by consultant. Ensure that the HMMP is implemented correctly.
Principal Contractor	Cranbrook and Regulatory Authorities	Manage hazardous materials. Provide this Report to all contractors prior to the commencement of any works onsite. Ensure WH&S requirements for the site are met by all subcontractors during any works. Supervise work by subcontractors, including Asbestos Removal Contractor if required.
Maintenance Contractors	Cranbrook / principal contractor	Request this Report Review this Report to determine if planned works will impact upon identified hazardous materials. If works are to impact upon identified hazardous materials ensure working procedures comply with this Report and current legislative requirements. Update SWMS with adequate control measures. If asbestos is to be impacted by works contact Cranbrook / Principal Contractor to organise removal/stabilisation via licenced asbestos removal contractor.
Licenced asbestos removal contractor	Cranbrook / principal contractor	Be licensed to undertake removal and/or management of asbestos waste (ASA or ASB as required). Undertake the removal works in accordance with the contract. Undertake the removal/stabilisation works in a safe manner & ensure the environment and staff WH&S is protected at all times during the works. Implement measures outlined in the HMMP.
Licenced asbestos assessor/ competent person (e.g. occupational hygiene consultant)	Cranbrook / principal contractor	Should be experienced with hazardous materials management, asbestos identification and risk assessment Provide environmental and WH&S consulting services in accordance with any Cranbrook contract. Ensure works are undertaken in compliance with the HMMP and prepare any final report/s required.

2. Scope of works

2.1 General

The identification of hazardous materials involves a combination of visual inspection of the accessible areas of the building/structure and the collection of representative samples of the suspect materials for the purpose of analytical confirmation. Where identical suspect materials are detected at different locations, visual confirmation only may have been made rather than additional sample collection.

2.2 Identification of material

2.2.1 Asbestos containing materials (ACMs)

Representative samples of materials suspected of containing asbestos were collected and analysed at our in-house NATA Accredited Laboratory. The identification of asbestos fibres is based on using Polarised Light Microscopy supplemented with Dispersion Staining techniques. This is detailed in Australian Standard 4964-2004 'Method for the qualitative identification of asbestos in bulk samples'. Asbestos samples were only collected for analysis where the safety of personnel would not be compromised. Sampling was conducted in accordance with the Parsons Brinckerhoff in house survey guide and the United Kingdom Health & Safety Executive publication, 'Methods for the Determination of Hazardous Substances 100, Surveying, sampling and assessment of asbestos-containing materials'.

2.2.2 Lead-based paint systems

Representative samples of paint were collected to determine quantitative lead content. Paint samples were analysed at Envirolab Services NATA Accredited Laboratory. Lead content is reported in percentage weight by weight and compared with AS4361.2-1998, Guide to Lead Paint Management, Part 2: Residential and Commercial Buildings lead containing paint system level of 1.0 per cent (w/w) of the dried film.

2.2.3 Lead containing dust

Samples of dust within ceiling spaces suspected of containing lead were collected to determine quantitative lead content. Dust samples were analysed at Envirolab Services NATA Accredited Laboratory. Lead content is reported as mg/kg of lead in the dust sample.

2.2.4 Synthetic mineral fibres (SMF) materials

Our experienced surveyors visually identified and recorded the presence of synthetic mineral fibre products onsite.

2.2.5 Polychlorinated biphenyls (PCBs)

Where access was available and power was isolated representative examples of each major type of fluorescent light fittings were examined to determine which lights were fitted with PCB containing ballast capacitors. The details of the brand, model of each capacitor and capacity were recorded and checked against with the ANZECC database of known PCB capacitors and PCB free capacitors.

If the light fittings were deemed unsafe to access, an assessment was made of the anticipated age of the light fitting and a presumption made wether the light fittings could possible contain PCB capacitors. These have been documented as presumed PCB containing capacitors.

The Australian and New Zealand Environment Conservation Council 'Polychlorinated Biphenyls Management Plan, November 1996' outlines the National Strategy for the management of PCBs.

The document defines PCB materials and wastes as follows:

PCB concentration	Waste classification
<2 mg/kg	- PCB free.
2 mg/kg - <50 mg/kg	- Non-Scheduled PCB material or waste.
>50 mg/kg	- Scheduled PCB material or waste.
>100,000 mg/kg (10%)	- Concentrated PCB material.

3. Site description

3.1 Site Location

Cranbrook School, 5 Victoria Road, Bellevue Hill NSW

3.2 Site details

The survey was restricted to accessible buildings and areas at the Bellevue Hill Senior School campus. Details of the buildings surveyed are presented below.

Table 3-1 Building descriptions

Building	Building description
001 – Cranbrook Building	Double storey sand stone building with pitched slate roof and basement. Utilised as offices, chapel and halls
002 - Harvey House	Double storey sand stone building with pitched slate roof. Utilised as accommodation
003 - Stacy Building	Single storey sand stone building with basement and pitched slate roof. Utilised as medical centre and class rooms
004 - Headmasters House	Double storey sand stone building with pitched slate roof. Utilised as headmasters residence
005 - Foundation Building	Double storey sand stone building with pitched slate roof. Utilised as offices and uniform shop
007 - James Rowland Building	Three storey brick building with flat metal roof utilised as workshops, offices, maintenance and storage
008 - Furber Building	Four storey brick building with pitch tiled roof. Building split into 3 sections join by walkways and stairs
009 - Senior School	Five storey brick building with flat metal roof utilised as the senior school including the library, classrooms, gym and swimming pool. Opened on 15 April 1981
010 - Bishop Building	Four storey brick building. Utilised as offices and science facility
011 - War Memorial Hall	Double storey brick building utilised as a hall and canteen. Opened 1952
012 - Mansfield Building	Double storey brick building with flat metal roof and patio. Utilised as an arts block. Opened 1967
013 - Perkins Building	Double storey sand stone building with pitched slate roof. Utilised as music department
014 - Carter Building	Four storey brick building. Utilised as offices and science facility. Opened in 2000
John Saunders Pavilion	Single storey timber clad Pavilion with canteen, first aid room and store

3.3 Survey restrictions

The inspection was limited to the buildings listed above. The survey was not fully intrusive and therefore wall cavities, foundation space and some sections of the ceiling space were not accessible. No access was possible to electrical equipment including light fittings and electrical distribution boards. This investigation was focused on the buildings and their fabric, no grounds investigations were undertaken. Some rooms and areas were inaccessible and these have been noted within the hazardous materials register in Appendix A.

4. Site inspection details

All materials encountered including negatives are presented in the hazardous materials register, Appendix A.

5. Hazardous materials risk assessment and priority ratings

To assess the health risk posed by the presence of ACMs, SMF, lead based paint and PCBs, the following factors must be considered.

5.1 ACM & SMF risk assessment factors

These factors include:

- condition of the material. This is described as being either good (not been damaged or have not deteriorated), medium (minor deterioration or damage) or poor (materials which have been extensively damaged or their condition has deteriorated over time)
- proximity of air plenums and direct air stream
- friability of the material (ease with which the material can be crumbled) listed as either friable or non-friable
- requirement for access for building or maintenance operations and accessibility (low, medium or high)
- likelihood of disturbance of the material
- exposed surface areas
- environmental conditions.

These aspects are in turn judged upon; (i) potential for fibre generation; and, (ii) the potential for exposure. When these factors have indicated that there is a possibility of exposure to airborne fibres, appropriate recommendations for repair, maintenance or abatement of the asbestos containing materials are made.

5.2 Lead based paint risk assessment factors

Risk assessment factors include:

- concentration of lead in paint
- condition of the paint. Deterioration/damage (peeling, flaking)
- proximity of air plenums, direct air stream and sensitive receptors such as foodstuffs
- ease with which the paint can be disturbed/removed
- requirement for access for building or maintenance operations and accessibility (low, medium or high)
- magnitude of exposed surface areas.

These aspects are in turn judged upon the potential for exposure. When these factors have indicated that there is a possibility of exposure to lead-based paint/dust, appropriate recommendations for the repair, maintenance, abatement and removal of the paint are made.

5.3 Polychlorinated biphenyls (PCBs) risk assessment factors

Risk assessment factors include:

- the manufacture age and location of the capacitor
- the condition of the capacitor (visible leaks/spills of fluid)
- potential of exposure to the PCBs from contact with capacitors
- ease with which the capacitors can be accessed
- the requirement for access to light fittings for building or maintenance operations and accessibility (low, medium or high).

As above, these aspects are in turn judged upon the potential for exposure. When risk factors have indicated a possibility of exposure to PCBs, appropriate recommendations for the removal and disposal of the capacitors are made.

5.4 Hazardous materials – priority ratings

The risk factors described above are used to rank the health risk posed by the presence of hazardous materials:

- Low Risk – describes hazardous materials that pose a low health risk to personnel, employees and the general public providing they stay in a stable, minimal access condition.
- Medium Risk – applies to materials that pose an increased risk to people in the area.
- High Risk – materials that pose a high health risk to personnel or the public in the area of the material.

5.4.1 Priority rating system for control recommendations

The following priority rating system is adopted to assist in the programming and budgeting of the control of hazardous material risk identified in the building:

5.4.1.1 High Priority: Hazard with Significant Risk Potential

An area has hazardous materials that are either damaged or are being exposed to continual disturbance. Due to these conditions, there is an increased potential for exposure and/or transfer of the material to other parts of the building with continued unrestricted use of this area. Prompt abatement of the hazard is recommended and instigation of control measures under a hazardous materials management plan.

5.4.1.2 Medium Priority: Hazard with Elevated Risk Potential

An area has hazardous materials with a potential for disturbance/exposure due to the following conditions:

- the material has been disturbed or damaged and its current condition, while not posing an immediate risk, is unstable
- the material is accessible and can, when disturbed, present a short-term exposure risk
- demolition, renovation, refurbishment, maintenance, modification or new installation, involving air-handling system, ceilings, lighting, fire safety systems or floor layout is scheduled.

Appropriate abatement measures should be taken at earliest possible convenient time. A negligible health risk exists if materials remain undisturbed under the control of a hazardous materials management plan.

5.4.1.3 Low Priority: Maintenance Controllable – Potential Hazard During Refurbishment

An area has hazardous materials, where the condition of the material is stable and has low potential of being disturbed and the material does not present an exposure risk unless disturbed such as abraded, washed or dismantled.

Negligible health risks are present if materials are left undisturbed under the control of a hazardous materials management plan. Defer any major action unless materials are to be disturbed as a result of maintenance, refurbishment or demolition operations.

6. Asbestos management plan

The following section shall detail the requirements for the management of asbestos containing materials (ACM) identified within the Cranbrook School buildings as detailed within the hazardous materials register attached in Appendix A.

This asbestos management plan (AMP) shall detail the following:

- Details of immediate recommendations for material exhibiting a potential medium risk to health.
- Control measures to be engaged for the management of the identified ACMs.
- Labelling requirements.
- Emergency procedures if ACMs are inadvertently disturbed / damaged.
- Safe work methods for the removal of identified ACM.
- ACM and management plan review requirements.

6.1 Recommendations

6.1.1 Medium Risk ACM

009 - Senior School Building, Level 1 balcony 1.26

Asbestos bituminous membrane was identified covering the floor of balcony 1.26. This material was in a fair condition due to heavy weathering with exposed asbestos fibres. As fibres were visible at the time of inspection it is recommended that access to this area is restricted until one of the following remedial actions is followed:

1. Encapsulation of the asbestos bituminous membrane with a sufficient encapsulate such as a thick acrylic weatherproof paint like “Emer-Clad”. This will encapsulate the asbestos fibres reducing the risk of fibre release to low. The material should therefore be managed in accordance with this management plan.
2. Remove the hazard by removing the bituminous membrane from the area. This should be undertaken as a friable asbestos removal project by a contractor holding a friable asbestos removal licence (ASA). This should involve the erection of an asbestos removal enclosure with a negative pressure unit and decontamination unit. The bituminous membrane should be removed with any remnant adhesive or membrane removed via the use of grinders. All works should be supervised by a licenced asbestos assessor who shall undertake asbestos air monitoring and clearance inspections.

Details of general removal requirements are presented in section 6.6 below.

010 - Bishop Building – Level 1 store and void space

A redundant moulded asbestos resinous pipe was identified running through level 1 stores MB1.7 and MB1.10 and the adjacent void along. This pipe has been broken in sections with asbestos containing debris present on the ground surface and surrounding area. It is understood that access isn’t available to students within this area however it is recommended that the area is restricted until such time as the pipe and associated debris can be removed and the area decontaminated. A redundant copper pipe was found within the void wrapped in asbestos rope that should also be removed.

Details of general removal requirements are presented in section 6.6 below.

012 – Mansfield Building, Level 2 north elevation balconies

Asbestos bituminous membrane was identified covering the floor of the level 2 balconies on the north elevation of the building. This material was in a fair condition due to heavy weathering with exposed asbestos fibres. As fibres were visible at the time of inspection it is recommended that access to this area is restricted until one of the following remedial actions is followed:

1. Encapsulation of the asbestos bituminous membrane with a sufficient encapsulate such as a thick acrylic weatherproof paint like “Emer-Clad”. This will encapsulate the asbestos fibres reducing the risk of fibre release to low. The material should therefore be managed in accordance with this management plan.
2. Remove the hazard by removing the bituminous membrane from the area. This should be undertaken as a friable asbestos removal project by a contractor holding a friable asbestos removal licence (ASA). This should involve the erection of an asbestos removal enclosure with a negative pressure unit and decontamination unit. The bituminous membrane should be removed with any remnant adhesive or membrane removed via the use of grinders. All works should be supervised by a licenced asbestos assessor who shall undertake asbestos air monitoring and clearance inspections.

Details of general removal requirements are presented in section 6.6 below.

012 – Mansfield Building, Level 2 Studio 3 – 2.5

The bench in the south east corner of the room adjacent to the door was found to be covered with a compressed asbestos cement sheet. As this bench top may be disturbed during normal activity it is recommended that it be removed and replaced with a non asbestos product. This material has been classified as a non-friable product and can be removed by a contractor holding a non-friable asbestos removal licence (ASB) or greater.

Details of general removal requirements are presented in section 6.6 below.

013 – Perkins Building, foundation space below offices 1.3 & 1.4

Asbestos cement debris was identified within the foundation space. Access to this area is currently restricted however it is recommended that the asbestos cement debris from within the foundation space be removed and the surrounding area decontaminated. This material has been classified as a non-friable product and can be removed by a contractor holding a non-friable asbestos removal licence (ASB) or greater.

Details of general removal requirements are presented in section 6.6 below.

John Saunders Pavilion, Canteen ceiling space

Asbestos contaminated dust and debris was identified within the ceiling space of the canteen above the asbestos cement ceiling lining. It is recommended that access to this area is restricted and the ceiling space decontaminated as soon as practicable with the use of HEPA type vacuums. As this material is classified as friable all asbestos removal should be undertaken by a contractor holding a friable asbestos removal licence (ASA).

Details of general removal requirements are presented in section 6.6 below.

6.2 Management of ACM

6.2.1 Asbestos cement sheeting and pipework

Non-friable asbestos cement sheeting and pipework was identified at a number of locations

As a minimum the asbestos cement sheeting should be maintained in a good and stable condition and labelled with asbestos warning labels that comply with the requirements of Work Safe Australia, How to Manage and Control Asbestos in the Workplace: Code of Practice 2011.

Good and stable condition means that the material should be sealed and any evident damage repaired.

If the asbestos cement sheeting is to be removed, general requirements detailed within section 6.6 below should be followed.

6.2.2 Asbestos containing bituminous membrane flooring

Potentially friable asbestos containing bituminous membrane flooring was identified to balconies in the senior School Building (009) and the Mansfield Building (012). As detailed in section 6.1 above, this material was found to be in a fair to poor condition with visible asbestos fibres protruding from the bituminous membrane. If this material is to be left present onsite it should be encapsulated with sufficient encapsulate such as “Emer-Clad” a thick acrylic weatherproof paint. Whatever ever encapsulate is used it should comply with current Australian requirements for non-slip surfaces.

The flooring should then be maintained in a good and stable condition and labelled with asbestos warning labels that comply with the requirements of Work Safe Australia, How to Manage and Control Asbestos in the Workplace: Code of Practice 2011.

It may be however more cost effective in the long run to remove the floor covering and as such should be undertaken in accordance with removal general requirements details in section 6.6 of this document.

6.2.3 Asbestos millboard to ZIP hot water unit

Potentially friable asbestos millboard was identified lining the internal ZIP hot water unit vessel identified within the roof space of the Headmasters House (004). In its current location and state the material was found to be in a good and stable condition and should be kept as such. The unit should be labelled with asbestos warning labels that comply with the requirements of Work Safe Australia, How to Manage and Control Asbestos in the Workplace: Code of Practice 2011.

If the unit is no longer to be used and is to be removed it should be wrapped and removed and disposed of as a whole unit without disturbing the material within. General removal requirements are detailed in section 6.6 of this document.

6.2.4 Asbestos containing vinyl tiles

Non-friable asbestos containing vinyl floor tiles were identified in the James Rowland Building (007) and the Senior School Building (009).

As a minimum the floor tiles should be maintained in a good and stable condition and labelled with asbestos warning labels that comply with the requirements of Work Safe Australia, How to Manage and Control Asbestos in the Workplace: Code of Practice 2011.

Good and stable condition means that the tiles are fixed hard to the ground surface.

If the tiles are found to be broken, well-worn or appear to be shifting these should be removed in accordance with current legislative requirements.

6.2.5 Asbestos containing putty

Non-friable asbestos containing putty was identified within the Senior School Building (009) between the aluminium window frames and glass panes. This material was found to be in a good and stable condition at the time of inspection.

As a minimum the putty should be maintained in a good and stable condition, this may require the putty to be encapsulated with silicon or non-asbestos containing putty.

As putty is a non-homogeneous product it is recommended that if any works are to be undertaken on putty or mastic type products within the senior school building that these are re-tested to confirm their asbestos content prior to commencement of works.

If it is decided that the putty material is to be removed this should be undertaken in accordance with general removal requirements as details within section 6.6 of this document.

6.2.6 Asbestos containing resinous electrical backing boards

Non-friable asbestos containing resinous electrical backing board were identified at different locations of the school.

As a minimum each electrical backing board should be maintained in a good and stable condition and labelled with asbestos warning labels that comply with the requirements of Work Safe Australia, How to Manage and Control Asbestos in the Workplace: Code of Practice 2011.

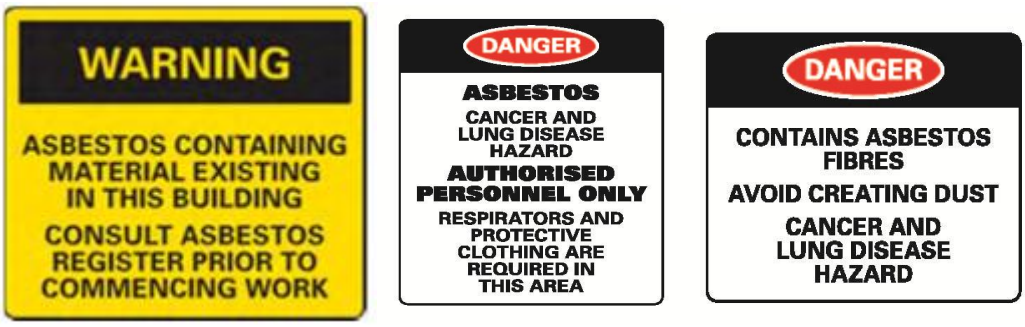
Good and stable condition means that the backing board should be suitably sealed and any evident damage repaired. If it is decided that the board is to be removed this should be undertaken in accordance with details within section 6.6 of this document.

6.3 Warning signs and labelling requirements

Asbestos warning signs shall be placed at all main entrances to each building containing asbestos and should comply with AS 1319 *Safety Signs for the Occupational Environment*.

Where practicable such as on asbestos cement wall cladding and ceiling linings, asbestos warning labels should be fixed. These should be consistent with locations listed in the hazardous materials register.

An example of signage and labels that should be utilised is presented below.

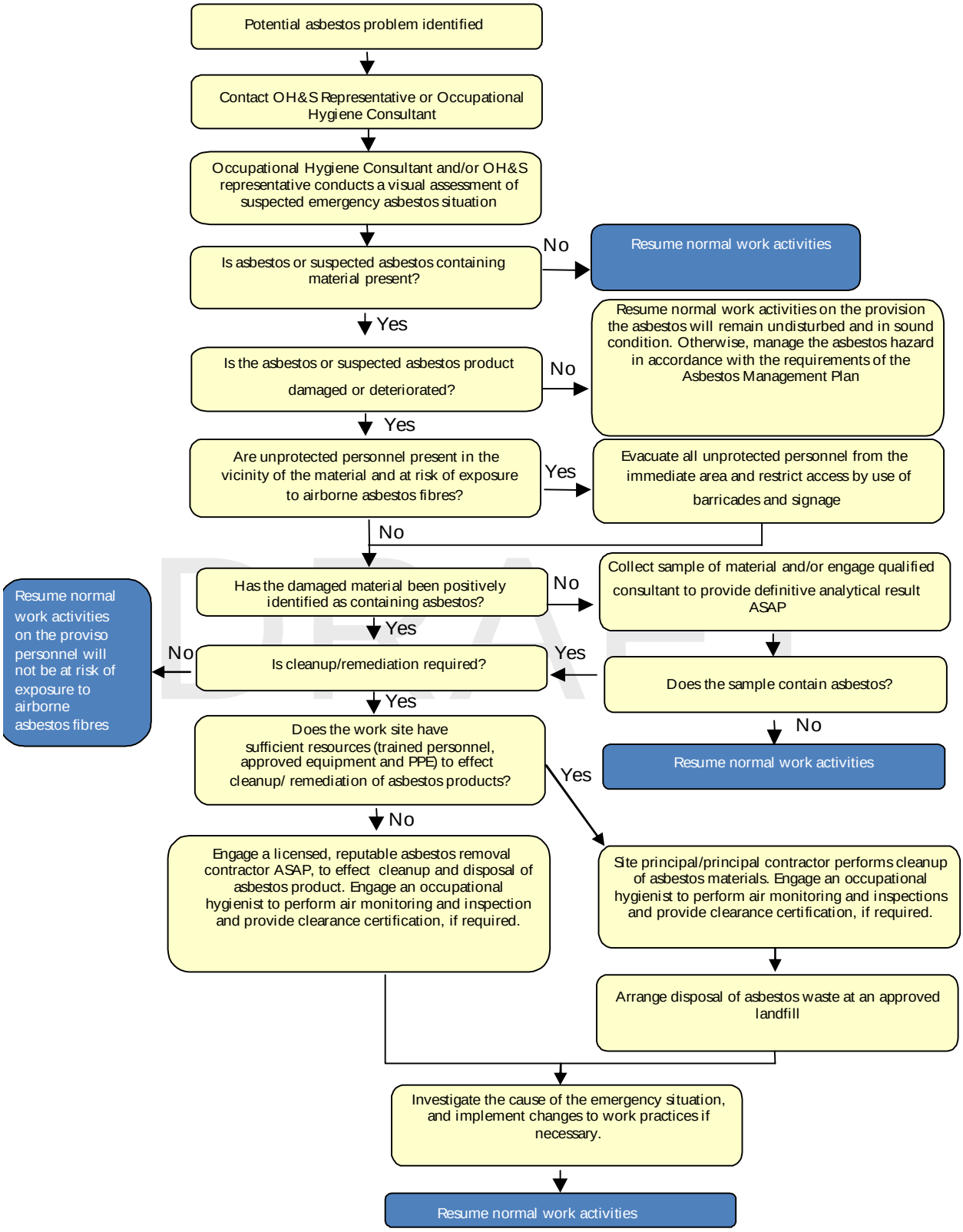


6.4 Emergency procedure

If damaged ACM is identified or damaged suspected ACM is identified during normal occupation of the buildings or during works within the buildings the following procedure should be followed.

- The area should be isolated by closing off of the area via closing any doors to the affected area or barricading the area off with the use of warning signage and or tape.
- An occupational hygiene consultant and/or licenced asbestos assessor should be engaged to undertake an investigation of the damaged ACM.
- The investigation should include asbestos fibre air monitoring within the area to be undertaken by an occupational hygiene consultant and/or licenced asbestos assessor with NATA accreditation for fibre counting in accordance with the National Occupational Health and Safety Commission (NOHSC) (2005), Guidance Note on the Membrane Filter Method for Estimation Airborne Asbestos Fibres [NOHSC:3003(2005)].
- The occupational hygiene consultant and/or licenced asbestos assessor should develop an asbestos removal control plan and determine if the asbestos is friable or non-friable. An asbestos removal contractor licenced in either Friable (ASA) or Non-friable (ASB) removal (depending on the assessment made) should be engaged to remove / stabilise the damaged ACM.
- In general and in respect to schools, if the works are deemed to be an emergency, a WorkCover 5 day notification shall not be required however the asbestos removal contractor must advise WorkCover within 24 hours of being advised and/or undertaking the emergency works.
- The occupational hygiene consultant and/or licenced asbestos assessor should perform asbestos fibre air monitoring during the removal/stabilisation works and perform a clearance inspection and develop a clearance certificate following the works. The asbestos register should be updated and details of the works included within this hazardous materials management plan.

Figure 6.1
Emergency Response Flow Chart



6.5 Management plan review periods and updates

Details of any asbestos remediation works must be documented within this management plan. Space has been provided within each registers to detail works. Clearance certificates and air monitoring certificates should be filed with this document for a period of at least 30 years.

This management plan and register must be reviewed at least every five years or when requested by a health and safety representative or when asbestos is removed, disturbed, sealed or enclosed or when changes to a control measure are made or when the plan is no longer adequate.

6.6 Asbestos Removal Control Plan (ARCP)

6.6.1 General

- Parsons Brinckerhoff has provided the following recommendations as a general guide for the safe removal of asbestos containing materials in accordance with the requirements of Safe Work Australia How to Safely Remove Asbestos, Code of Practice 2011. Prior to the commencement of any specific asbestos removal works, a site and material specific asbestos removal control plan must be developed by a competent person such as a licenced asbestos assessor or licensed asbestos removal contractor.
- All persons engaged in asbestos removal work should wear appropriate PPE including respiratory protective equipment (RPE) conforming with the requirements of AS/NZS1716-2003 Respiratory Protective Devices' and AS/NZS 1715:2009 Selection, Use and Maintenance of Respiratory Protective Devices. Protective disposable coveralls must be chosen that provide particle-tight protection (Type 5) and limited splash-tight protection (Type 6). Disposable coveralls should not have external pockets or Velcro fastenings.
- All work should be carried out in accordance with Safe Work Australia How to Safely Remove Asbestos, Code of Practice 2011 and the NSW WHS Regulation 2011 made under NSW WHS Act 2011. Handling and disposal of asbestos waste material should be carried out in accordance with NSW DECCW Waste Classification Guidelines: Classifying Waste (April 2008) revised 2009.
- All fibre air monitoring shall be carried out by an licenced asbestos assessor with NATA accreditation such as Parsons Brinckerhoff in accordance with National Occupational Health and Safety Commission (NOHSC), Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC:3003(2005)], NOHSC, Australia.
- Personal decontamination must be undertaken each time workers leave the asbestos work area and at the completion of the asbestos removal work. Personal decontamination should be undertaken within the nominated decontamination area. The extent of decontamination required is dependent upon the type of asbestos being removed. If friable asbestos is being removed then a three stage wet decontamination unit shall be required. If it is noted that non-friable ACM is being removed this may be undertaken in a nominated dry decontamination area. Refer to Safe Work Australia How to Safely Remove Asbestos, Code of Practice 2011 and NSW WHS Regulation 2011 made under the NSW WHS Act 2011 for personal decontamination methods.
- A clearance inspection of the work area shall be undertaken at the completion of the works by a licenced asbestos assessor such as Parsons Brinckerhoff in accordance with Safe Work Australia How to Safely Remove Asbestos, Code of Practice 2011.

Prior to the commencement of any specific asbestos removal works, a site and material specific asbestos removal control plan must be developed by a competent person such as a licenced asbestos assessor or licensed asbestos removal contractor.

6.7 Waste disposal

- All asbestos containing materials removed must be either wrapped and sealed within 200 µm thick polythene or placed within a 200 µm polythene bag which is no longer than 1200 mm and no wider then 900mm wide.
- Bins or tip trucks should be utilised during the removal process and placed as close as possible to the asbestos removal area.
- The bins/trucks must be lined with 200 µm thick polythene prior to being filled with the wrapped asbestos waste. The bins/trucks must be sealed (covered with 200 µm thick polythene) at the end of each shift and prior to removal off site.
- When bins are ready to be moved from the work area they must be sealed and inspected by the occupational hygiene consultant and/or licenced asbestos assessor to ensure they are sealed correctly prior to movement to the waste disposal facility.

6.8 Air monitoring and clearance procedures

- In all cases an occupational hygiene consultant who may also be a licenced asbestos assessor for friable removal or a competent person for non-friable removal with NATA accreditation from a company such as Parsons Brinckerhoff will be required on site to carry out perimeter, personal and clearance air monitoring and inspections. The hygienist will be required to carry out a full visual inspection of the work area prior to the commencement of any hazardous materials removal works to ensure containment measures are satisfactory.
- During all asbestos removal works 'work in progress' air monitoring should be undertaken surrounding the work area, decontamination areas, negative pressure units and waste transit route.
- Following the completion of the hazardous materials removal works the occupational hygiene consultant will be required to undertake a thorough visual inspection of the work area and transit route.
- If removal works are not to the satisfaction of the occupational hygiene consultant, removal contractors will be required to re-enter the work area and rectify any issues arising from the inspection.
- If removal works are to the satisfaction of the occupational hygiene consultant, the removal contractor will be allowed to apply PVA solution to the enclosure if deemed necessary.
- Only following satisfactory clearance inspection and air monitoring where required, will removal works be deemed as completed.
- A final inspection by the occupational hygiene consultant of the work site will be required following removal of enclosure and equipment to ensure no debris or dust remains onsite.

6.9 Decontamination

- Personal decontamination must be undertaken each time workers leave the asbestos work area and at the completion of the asbestos removal work. Personal decontamination should be done within the asbestos work area where re-contamination cannot occur. Refer to Safe Work Australia How to Safely Remove Asbestos, Code of Practice 2011 and the NSW WHS Regulation 2011 made under NSW WHS Act 2011 for personal decontamination methods

6.9.1 Non-friable (bonded) Asbestos

- For non-friable (bonded) asbestos removal works a dry decontamination area is to be set up at the entry point of the asbestos work area. This will include a sheet of 200 micron thick polythene weighed down with sandbags being laid on the floor with a bucket of water and a bag of rags.
- When leaving the work area all site personnel must make their way to the nominated dry decontamination area, remove their coveralls and clean their masks and boots using the wet rags. Respirator must remain on during decontamination and must only be removed on completion of decontamination.
- All equipment that is to leave the work area must also be decontaminated in the dry decontamination area with the use of wet rags.
- Any equipment that cannot be decontaminated completely such as HEPA vacuum cleaners and brushes must be placed and sealed in 200µm polythene bags prior to removal from site.
- Once the decontamination process is complete contaminated rags and coveralls must be disposed of in 200µm polythene bags.
- At completion of works all asbestos related materials including polythene, coveralls, geo-fabric and rags must be double wrapped and sealed for disposal as asbestos contaminated waste.

6.9.2 Friable Asbestos

- For friable asbestos removal works a wet three stage decontamination unit will be set up adjacent to, and directly connected with, the enclosed asbestos work area.
- The three stages are divided into the dirty decontamination area, clean decontamination area and clean changing area.
- When leaving the work area all site personal must enter the dirty decontamination area, vacuum clean or hose down all contaminated coveralls and footwear. Remove footwear and leave boots upside down within dirty decontamination area. Shower while wearing protective clothing and respirator with warm water. Leave respirator on and remove coveralls and place in 200 micron thick polythene bag.
- Move to clean decontamination area and commence showering and remove respirator. Thoroughly wash hands, fingernails, face, head and respirator. Store the respirator in a suitable container within the clean decontamination area.
- Move to the clean change area, towel dry and change into clean clothes.

7. Synthetic Mineral Fibre (SMF) Material

7.1 SMF Material

SMF material was identified within the school in the form of insulating batts typically within the buildings ceiling space, within hot water units, air handling duct work and units and suspended ceiling tiles. In general these materials were found to be in a good and stable condition and should be maintained as such. Details of the location of the SMF material is provided within the hazardous materials register in Appendix A.

7.2 SMF material management

If works are to be undertaken on or with any SMF material throughout the school the removal / disturbance of this material should be undertaken in in accordance with the National Occupational Health and Safety Commission *National Code of Practice for the Safe Use of Synthetic Mineral Fibres* [NOHSC: 2006 (1990)].

In general this should include the control of any process by ensuring dust suppression techniques are in place during removal, any waste in general should be wrapped prior to disposal and good housekeeping techniques maintained during and after the works to ensure the area is clear of SMF material prior to returning to the school.

All contractors working on and with SMF material should be provided with personal protective equipment such as disposable coveralls, gloves, safety glasses and respiratory protective equipment such as a disposal P2 respirator or greater.

8. Lead paint system

8.1 Lead paint systems

Lead paint systems have been identified throughout the site. They are generally in a good and stable condition and should be maintained as such. Details of the location of the lead paint systems is provided within the hazardous materials register in Appendix A.

8.2 Lead paint management

All lead paint removal/stabilisation must be undertaken in accordance with the Australian Standard AS4361.2-1998, Guide to lead paint management, Part 2: Residential and commercial buildings.

General the stabilisation of lead paint involves the removal of flaking lead paint while minimising dust release, washing down the area with a sugar soap solution controlling water runoff and repainted with an appropriate paint. Paint may also be stripped using chemical strippers. At no point should the paint be removed with the use of dry mechanical sanding or grit blasting unless control mechanisms can be put in place to control dust release and effects on operatives.

Prior to the commencement of any works that will impact upon lead paint systems a hygienist should be engaged to develop a hazardous materials removal control plan that will detail the safe removal and disposal requirements.

8.3 Lead contaminated dust

Lead contaminated dust was identified within the Foundation Building (005), level 1 ceiling space of the foundation office 2.8. It is recommended that the ceiling space is decontaminated with HEPA type vacuums and the area sealed with a PVA solution following clearance inspection. It is recommended that the remediation works are undertaken within 6 months.

9. Poly Chlorinated Biphenyls (PCB)

Fluorescent light fittings could not be accessed during the investigation due to the inherent electrical hazard. As such a presumption has been made that the fluorescent light fittings that were manufactured prior to 1980 within the school may be fitted with PCB containing capacitors.

If during regular maintenance of the buildings a decision is made to remove the light fittings the following procedure should be followed for their safe removal.

9.1 General

- All persons engaged in PCB removal work should wear appropriate PPE including respiratory protective equipment (RPE) conforming with the requirements of AS/NZS1716-2003 Respiratory Protective Devices' and AS/NZS 1715:2009 Selection, Use and Maintenance of Respiratory Protective Devices. Disposable coveralls that provide particle-tight protection (Type 5) and limited splash-tight protection (Type 6) should be utilised such as "Tyvex" coveralls.
- Personal decontamination must be undertaken each time workers leave the PCB work area and at the completion of the PCB removal work. Personal decontamination should be done within the PCB work area where re-contamination cannot occur. Refer to the ANZECC Identification of PCB Containing Capacitors (1997) and the NSW WHS Regulation 2011 made under NSW WHS Act 2011 for personal decontamination methods.
- All work should be carried out in accordance with the ANZECC Identification of PCB Containing Capacitors (1997) and the NSW WHS Regulation 2011 made under NSW WHS Act 2011. Handling and disposal of PCB waste material should be carried out in accordance with NSW DECCW Waste Classification Guidelines: Classifying Waste (April 2008).
- A clearance inspection of the work area shall be undertaken at the completion of the works by an approved occupational hygiene consultant such as Parsons Brinckerhoff.

9.2 Removal of PCB containing capacitors

- Care should be taken to avoid spillage or leakage of PCBs. The following precautions should be taken:
- The electrician should wear the following PPE:
  - Disposable gloves made of materials that are resistant to PCBs such as Viton, polyethylene, polyvinyl alcohol (PVA), polytetrafluoroethylene (PTFE), butyl rubber, nitrile rubber or neoprene rubber. Do not use PVC or latex gloves. Mid-arm gauntlets may be required.
  - Disposable coveralls that provide particle-tight protection (Type 5) and limited splash-tight protection (Type 6) e.g.Tyvek.
  - A full face shield should be worn as eye protection.
  - P2 respirator if light fittings are found to be fixed to flaking lead paint or any asbestos or suspected asbestos containing material.
- Licensed electrician is to disconnect electricity from light fitting, unscrew fitting and pass to licensed removal contractor and hygienist. Licensed contractor and hygienist to be fitted with PPE.

- The capacitor is to be checked for leaks.
- If found to have leaked whole unit is to be double wrapped in 200 µm thick polythene sheeting.
- If no leaking is evident, the capacitor is to be removed and doubled bagged in 200µm thick polythene bags.
- The following markings are to be placed on both sides of the bags:
- "ENVIRONMENTAL CONTAMINANT – CLASS 6.1 (A). CAUTION - CONTAINS POLYCHLORINATED BIPHENYL (PCB) – A TOXIC ENVIRONMENTAL CONTAMINANT."
- All workers wash their hands thoroughly in warm soapy water before eating, drinking, smoking or using toilet facilities.
- Waste is to be placed within sealable metal containers. This container must be clearly marked with details above, maintained in a good condition (no visible signs of damage or corrosion). The container should be partially filled with absorbent material in case of any leakage.
- The container is to be disposed of at a facility licensed to accept PCB waste.

10. Statement of limitations

10.1 Scope of Services

This hazardous materials control plan ('the report') has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Parsons Brinckerhoff ('scope of services'). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

10.2 Reliance on Data

In preparing the report, Parsons Brinckerhoff has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ('the data'). Except as otherwise stated in the report, Parsons Brinckerhoff has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ('conclusions') are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Parsons Brinckerhoff will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Parsons Brinckerhoff.

10.3 Environmental Conclusions

In accordance with the scope of services, Parsons Brinckerhoff has relied upon the data and has not conducted any environmental field monitoring or testing in the preparation of the report. The conclusions are based upon the data and visual observations and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions.

Within the limitations imposed by the scope of services, the assessment of the site and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

10.4 Report for Benefit of Client

The report has been prepared for the benefit of the Client and no other party. Parsons Brinckerhoff assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of Parsons Brinckerhoff or for any loss or damage suffered by any other party in relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

10.5 Other Limitations

Parsons Brinckerhoff will not be liable to update or revise the report to take into account any events, emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to nor ownership of the properties, buildings and structures referred to in the report, nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.