

FMHS-AS01 UNSW Asbestos Management Plan V1.3

Estate Management

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Superseded Documents	None

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1 INTRODUCTION AND SCOPE

Exposure to asbestos has been linked with respiratory illness as well as other diseases. The identification of the hazards associated with asbestos, the evaluation of the risk and the control strategies to protect UNSW stakeholders is covered under this plan. It also serves to address the statutory obligations in management of asbestos, by providing a single point of reference for all related issues pertaining to UNSW campuses and field stations. The plan is available to all stakeholders involved in the management, operation and occupation of all buildings owned or managed by UNSW.

The plan should also be read in conjunction with the asbestos register for each of the UNSW Campus and Field Stations within New South Wales.

1.1 Plan review

This plan will be reviewed based on statutory requirements or when either new information needs to be included, or existing information needs to be modified.

1.2 Statutory links and legislative obligations

The following legislation and industry standard documentation are relevant to this plan and must also be referred to during implementation:

- Work Health and Safety Act 2011 (NSW);
- Work Health and Safety Regulation 2017 (NSW);
- Code of Practice: How to Safely Remove Asbestos (SafeWork Australia, 2011);
- NSW Protection of the Environment Operations Act 1997;
- Code of Practice: How to Manage and Control Asbestos In The Workplace (SafeWork Australia, 2011).

2 DEFINITIONS

- ACM: Asbestos containing material i.e. material not purely asbestos but contains a percentage of asbestos
- ALARA: As Low as Reasonably Achievable
- PCBU: Person conducting a business or undertaking
- RCP: Removal control plan which outline how ACM will be removed for a particular job

3 BACKGROUND

3.1 What is asbestos?

Asbestos is defined as the fibrous form of mineral silicates, which generally fall into two major groups:

- Serpentine group minerals: Chrysotile (white asbestos);

- Amphibole group minerals: Amosite (brown asbestos), Crocidolite (blue asbestos) and minor forms including Actinolite, Tremolite and Anthophyllite.

Asbestos minerals have separable long fibres that are strong and flexible enough to be spun and woven. Because of some of the beneficial properties of asbestos (i.e. heat resistance) it has been historically used for use in some types of manufactured goods, building materials, friction products, heat-resistant fabrics, gaskets and coatings.

3.2 Health impacts

The breathing in of asbestos fibres in their smallest forms can affect the lungs, with exposure potentially leading to respiratory disease and cancers (asbestos is a known carcinogen). The best controls are to either simply remove asbestos from the workplace where practical, or maintain it in such a way that the risk of fibre exposure is reduced to As Low as Reasonably Achievable (ALARA).

3.3 Types of asbestos

Within the two groups, asbestos can be classified into two main types, **friable** and **non-friable** (see Table 1). Typically, friable asbestos or ACMs are materials that can be crumbled, pulverised or reduced to powder by hand pressure when dry. However, in some cases, some types of non-friable material can become friable under certain circumstances (i.e. weathering, chemical damage etc). Friable ACMs are also considered higher risk materials as they are more readily damaged, thereby possibly releasing their fibres into the air.

Those that cannot be pulverised by hand pressure are considered as non-friable and are 'lower' risk if properly handled. Non-friable ACMs are often referred to as 'bonded', where the asbestos is bound in a matrix such as Portland cement (e.g. fibre-cement sheeting) or various resin/binders (e.g. vinyl floor tiles, Table 1).

Table 1- common ACMs found in the two groups:

Friable

- Sprayed or trowelled ACMs applied to ceilings, walls and other surfaces for fire-rating purposes. This material is often referred to as 'limpet asbestos',
- Asbestos-containing insulation on pipes, boilers, tanks, ducts etc. which is often referred to as asbestos lagging,
- Asbestos paper products, millboard in underlying lining for linoleum or vinyl floor coverings,
- Asbestos textiles, braided asbestos, rope, tape, etc,
- Asbestos millboard inside electrical switchboxes/fuse boards or air-conditioning re-heat boxes.

Non-Friable

- Asbestos cement sheeting and corrugated sheeting products, i.e. cement or concrete like products (e.g. 'fibro' and 'super six roofing' – see description below),
- Vinyl tiles and vinyl flooring mastic and associated adhesives,
- Asbestos-containing compounds, gaskets and mastic from mechanical fittings, and roofing membranes,
- Compressed bitumen electrical backing boards and asbestos-cement sheeting in electrical cupboards and switchboards,
- Roofing sealants, bituminous membranes, tar composites and similar materials were occasionally mixed with asbestos.

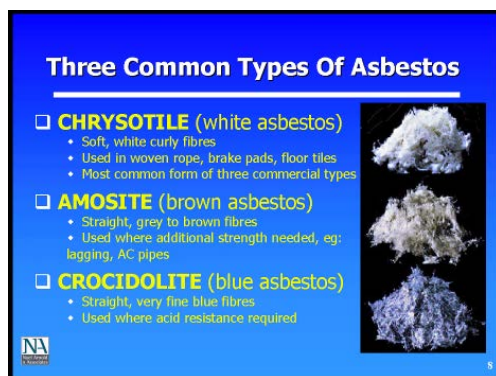


Figure 1: Types of Asbestos

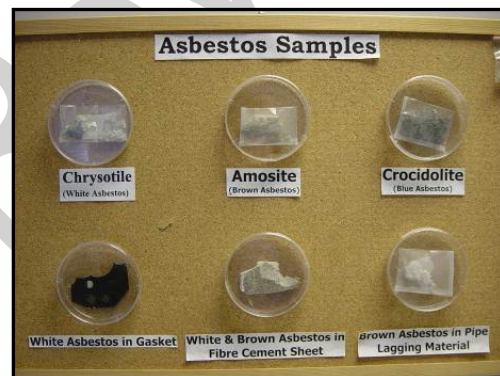


Figure 2: Asbestos types and their appearance

3.4 Cement products

Asbestos cement (AC) products are a very common type of ACM and were installed extensively throughout commercial, industrial and residential facilities up until the early to mid 1980's.

AC products are examples of bonded ACM, and typically contain between 5–15% of asbestos by weight. Usually chrysotile asbestos (white asbestos) is the main type of asbestos present.

AC products are comprised of Portland cement, sand, binders and various combinations of both asbestos and non-asbestos fibres. The asbestos is tightly bound or encapsulated within the cement matrix of the products.

In general, the asbestos fibres for AC are not easily released to become airborne in significant quantities unless the cement matrix is disturbed or disrupted (i.e. if cutting AC products with power saws etc).

AC products were manufactured in numerous shapes and sizes and include asbestos cement sheeting eaves, awnings, walls, ceilings and gables/cladding, corrugated/moulded asbestos-cement sheeting roofs, ridge-capping and gutters. Examples of AC material identified at UNSW can be seen within Figures 3 & 4.



Figure 3: COFA Campus, Block C, Ground Level, Room CG11, Ceiling – Fibre Cement Sheeting



Figure 4: Fowlers Gap Field Station, Generator Shed, Ground Level, Walls and Ceiling Throughout – Fibre Cement Sheeting

3.5 Asbestos-containing vinyl floor tiles and adhesives

Vinyl tiles and linoleum flooring manufactured prior to 1984 may contain asbestos in varying quantities in a well-bound cohesive matrix. Asbestos-containing vinyl floor and wall coverings do not present a significant health risk unless they are sanded or otherwise mechanically abraded so as to release asbestos fibres. Examples of asbestos vinyl floor tiles adhesive as identified at UNSW can be seen in Figures 5 & 6.



Figure 5: Hay Field Station, Building HFS7, Ground Level, Room G07 - asbestos containing vinyl floor tiles

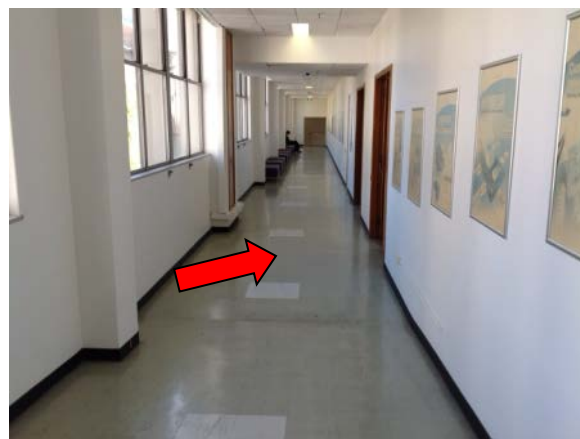


Figure 6: Kensington Campus, Electrical Engineering Building G17, Level 1, Room 1Q2 – Asbestos containing vinyl floor tiles

3.6 Asbestos-containing electrical backing boards

Electrical backing boards in older switchboards and electrical cupboards often contain asbestos in the form of bundled Chrysotile (white asbestos) fibres, in compressed bitumen. This form of ACM is considered non-friable, and the release of fibres is less likely unless the matrix is disturbed by methods such as cutting or drilling with power tools etc. The NSW Electrical Industry Asbestos Awareness Committee (EIACC) in conjunction with NSW SafeWork NSW produced a number of guidelines for working on electrical meter panels/backing boards. Examples of asbestos-containing electrical backing board as identified at UNSW are shown in Figures 7 & 8.



Figure 7: Kensington Environs, 32 Botany Street, Ground Level, Exterior South-East Side, Switchboard – Compressed bituminous electrical panel



Figure 8: Kensington Campus, Morven Brown Building, Ground Level, Room GQ4, Electrical Distribution Board – Compressed bituminous electrical panel

3.7 Asbestos-containing insulation materials

Certain types of insulation can contain asbestos (i.e. a range of anywhere from 20% - 95%). Protective jackets on the insulation materials (such as metal or calico on pipe lagging) tend to prevent asbestos fibre release. However, physical damage to the protective jacket(s) can result in the release of respirable fibres, or the binding material in the insulation can deteriorate with age rendering it more friable. For other applications such as use in money safes, the material is often securely encased and does not pose a high risk as the items are normally inaccessible. An example of presumed asbestos-containing safes as identified at UNSW can be seen in Figure 9. There may be other types of equipment which contain asbestos, any suspicious equipment should be checked with the manufacturer to determine if there is a risk.

3.8 Asbestos-containing millboard

Millboards are used for insulation of electrical equipment and for thermal insulation. The asbestos fibres can be released with relative ease when disturbed. Insulation to internal lining of ductwork sections and electrical re-heat air conditioning boxes generally contain asbestos millboard. These should be replaced with non-asbestos equivalents during routine maintenance. An example of presumed asbestos-containing millboard insulation as identified at UNSW can be seen in Figure 10.



Figure 10: Randwick Campus, Building R9 (Tram Shed), Ground Level, Room G20, on top of ceiling – asbestos containing millboard insulation



Figure 9: Moiney safe on the Randwick Campus, Building R9 Tramshed, Mezzanine Level, Room M08

3.9 Fire doors with asbestos cores

Asbestos insulating cores as used in fire door cores (prior to the early 1980's) usually contain a mixture of chrysotile and amosite asbestos (usually 15% - 40%). Protective material surrounding the asbestos-core (i.e. the timber or metal) will generally prevent asbestos fibre release if undamaged. However physical damage to these protective materials may lead to the release of respirable fibres. These doors should never be sawn or drilled but inspected regularly for damage. Examples of presumed asbestos-containing fire doors identified within UNSW can be seen in figures 11 & 12; in most cases, fire doors have had asbestos label place don them).



Figure 11: Randwick Campus, Building R9 Tram Shed, Mezzanine Level, Room MQ2, Stairwell – fire door core



Figure 12: Kensington Campus, Building D26 Biological Sciences, Level 3, Room 340 – fire door core

3.10 Asbestos-containing lagging materials

Insulation such as lagging usually contains a smaller percentage of asbestos (usually 20% and possible up to 95%). Protective jackets on the insulation materials such as metal jacketing or calico on pipe lagging often prevent asbestos fibre release. However physical damage to the protective jacket can lead to the release of respirable fibres. The binding material in the insulation can deteriorate with age rendering it more friable. Examples of presumed asbestos-pipe lagging as identified at UNSW can be seen in Figures 13 & 14.



Figure 13: Kensington Campus, E6 Roundhouse, Ground Level, Room GQ14, ceiling space pipework insulation, lagging



Figure 14: Kensington Campus, K15 Old Main Building, ground Level, room G69A duct – pipework insulation, lagging

3.11 Asbestos containing mastic material

The flexible sealant material that fills the gaps between the walls, windows and roof panels can contain chrysotile asbestos. These bonded ACMs are unlikely to represent an asbestos health risk unless they are significantly damaged. Examples of presumed asbestos-containing sealing material as identified at UNSW are shown in Figure 15:



Figure 15: Kensington Campus, H25 Botany Street parking station, level one, central East fire stairs – mastic to windows

4 ACM MANAGEMENT AT UNSW

4.1 Purpose and objectives

The AMP represents an integrated risk management approach to ensure that all practicable steps are taken to prevent or minimise the risk of exposure by UNSW stakeholders or others to ACMs whilst on the campus. The AMP therefore aims to address the following:

- **Risk control:** outlines the necessary actions to control the risk as required by relevant legislation(s),
- **Authority and accountability:** identifies and describes the administrative line of authority for all UNSW sites, outlining responsibilities, procedures and systems for the effective management and control of ACMs at the site,
- **Timeframes:** establishes a timetable for the review and assessment of the ACMs,
- **Permit-to-work:** where appropriate, instigates a work permit system which ensures that any proposed maintenance, installation, alteration or renovation at the sites are notified to the UNSW EM,
- **Responsibility:** requires that all participants involved in the management and operations at the sites are clearly informed and where necessary trained to manage the ACM risks,
- **Register:** the ACM Register forms an integral part of an effective AMP. The AMP and ACM register must be made available as required for inspection by tenants, other employers, employees, union representatives, government representatives, contractors, maintenance personnel and the regulator,
- **Consultation:** provide feedback and up to date information to local areas through consultation channels (i.e. Lv3 committees, HS representatives, contractors and others).

Figure 16 outlines the process identifying, assessing and controlling ACMs in the AMP.

Figure 16: general principals of an AMP

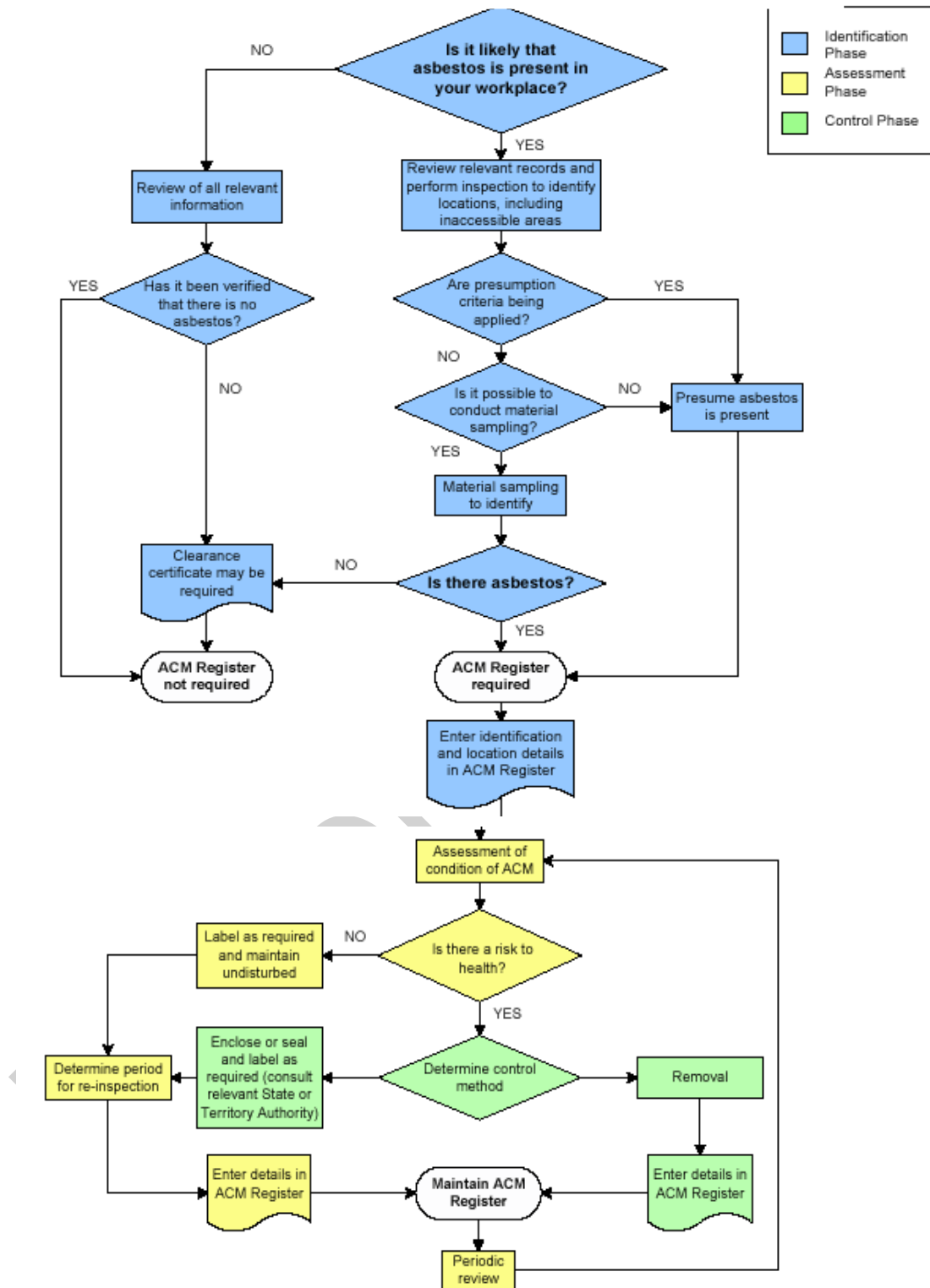


Figure 16: Source: Code of Practice for the Management & Control of Asbestos in Workplaces [NOHSC:2018(2005)]. (note: although a new version of the Code of Practice has been issued (Code of Practice: How to Manage & Control Asbestos in the Workplace (SafeWork NSW, Dec 2011)), general principals described above are still relevant for a Management Plan)

4.2 Legislative Requirements

The UNSW AMP is designed to assist in fulfilling its general obligations to ensure the health and safety of employees, contractors, visitors, students and others in prevention of asbestos exposure. The AMP also addresses specific ACM related legislative requirements and guidelines in approved industry standards. UNSW EM is responsible for implementing the plan for the UNSW campus.

4.3 Authority and responsibility

Under the AMP, ACM related activities at UNSW are carried out under the authority of authorised persons within EM. Local area stakeholders also have a duty under this plan as defined within section 4.4 and outlined within Figure 17.

Under Review

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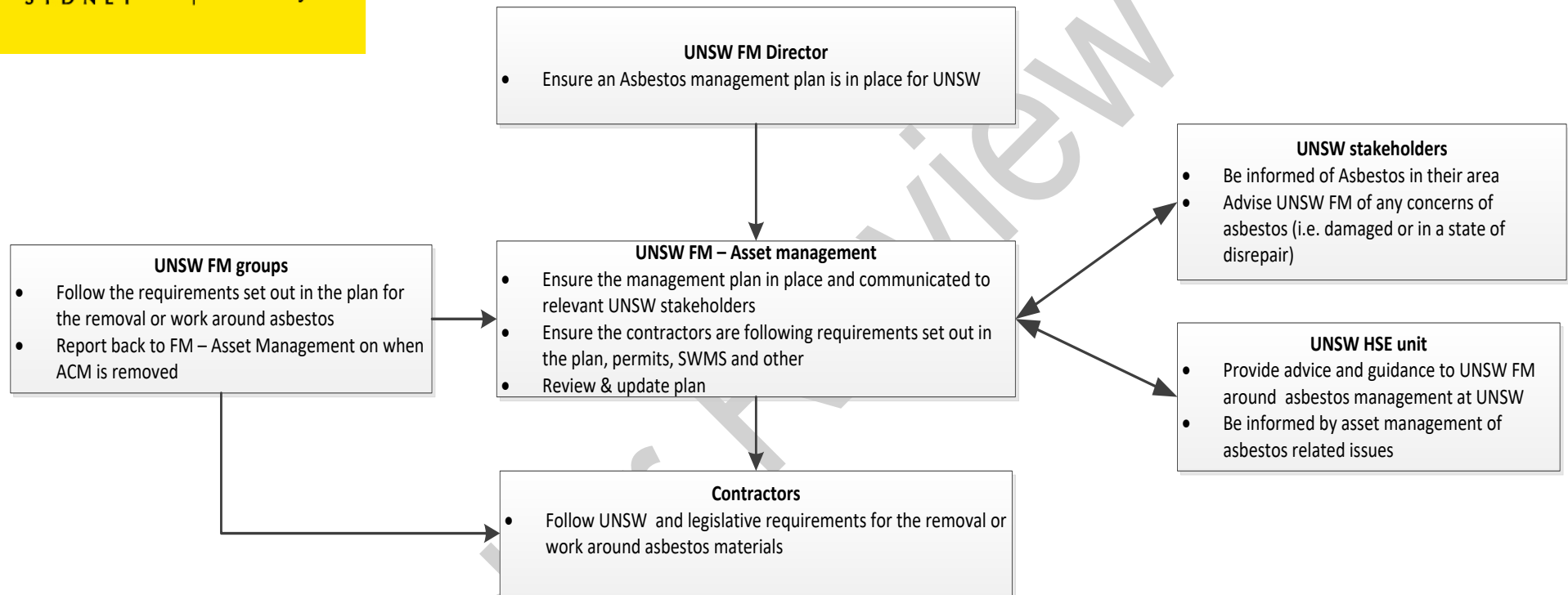


Figure 17: Responsibilities under the UNSW AMP

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4.3.1 UNSW EM and implementation AMP

UNSW EM is responsible for the management and supervision of ACM related work and services. The following tasks are managed through UNSW EM:

- **Plan management:** ensures the AMP is reviewed and current,
- **Inspection:** ensuring a competent person as far as is reasonably practicable has inspected ACM at UNSW,
- **Register:** ensuring a asbestos register is in place,
- **Register review:** ensuring the register is updated when ACM removals occur,
- **Reinspection:** ensuring reinspection occurs through risk assessment and in accordance with WHS statutory requirements which is every 5 years,
- **ACM information access:** ensuring UNSW stakeholders, contractor and others have access to this plan and other resources,
- **Competency:** ensuring there is an established selection process to ensure competent persons are employed for ACM work,
- **Training:** ensuring there is the provision of relevant training to UNSW stakeholders,
- **Risk management process for removal:** ensuring established processes are in place for removal works and /or work near ACM,
- **Signage and labels:** ensuring ACM warning signage (during removal) and labels are in place,
- **Consultation:** ensuring there are consultation channels with stakeholders, contractors and others in regards to ACMs,
- **Emergency management:** ensuring there are emergency management procedures in place for ACM issues,
- **Records management:** ensuring there is a records management process for ACM documents.

4.4 Building Occupants/local stakeholders

- Building occupants are not permitted to undertake any modifications to UNSW buildings or infrastructure (including internal contractors) without approval from EM.
- Building occupants are however required to do the following regarding ACMs (not strictly exhaustive):
 - immediately report to UNSW EM any issues where there is suspected or actual damaged ACM,

- report failing administrative controls such as labels falling off ACM labelled material etc,
- advise EM of any contractor(s) or other person(s) who may be conducting unauthorised work on or near ACM in a way that has the potential for damage.

4.5 Risk management strategies for ACM on the UNSW campus

4.5.1 Inspection

For protection of UNSW stakeholders and in accordance with WHS legislation, UNSW has an ACM inspection with a frequency set by regulator and statutory requirements (i.e. every 5 years or earlier as determined through risk assessment and/or consultant advice). The most recent inspection was conducted in 2013/2014 (Greencap NAA Ref: J123597-JK-01/02) in order to identify ACMs, assess the risk they present and provide remedial options for the materials where necessary. To date, ACM inspection on the campus has identified the following types of ACM (for specific details of locations etc refer to the UNSW ACM register):

- Fibre cement materials,
- Vinyl floor tiles and adhesive,
- Electrical backing boards,
- Safe insulation,
- Millboard insulation to reheat units,
- Fire door cores,
- Bitumen membrane,
- Lagging material,
- Mastic sealant materials.

A range of measures are available for the control of ACM risks and should be used based on the assessed risk for each specific location at UNSW. These measures may include:

- Leave and maintain ACM in existing condition,
- Repair and maintain in good condition,
- Encapsulate using adhesive, mastic or providing a barrier such as a box enclosure or steel cladding,
- Remove by approved methods under controlled conditions,
- Label ACMs that are to remain *in-situ* to ensure that the ACMs are not damaged inadvertently by maintenance contractors etc.

4.6 Unknown or presumed ACMs

UNSW has made every effort to identify all possible sources and locations of ACM on site. However, it may be that ACMs are located in concealed inaccessible areas/voids which were not practically accessible areas during previous ACM inspections. Such inaccessible areas may include:

- Above-ceilings & below-floor spaces,
- Locations behind locked doors,
- In wall cavities,
- Areas accessible only by dismantling equipment or performing demolition works,
- Service shafts, ducts etc., concealed within the building structure,
- Voids or internal areas of plant, equipment, air conditioning ducts etc,
- Totally inaccessible areas such as voids and cavities created and intimately concealed within the building structure. These voids are only accessible during major demolition works,
- Height restricted areas.



Therefore, prior to any refurbishment works, UNSW utilises further investigations using destructive surveys and sampling techniques where necessary to help ensure unknown ACMs are identified. During the course of normal site works, contractor care is exercised when entering any previously inaccessible areas and contractors are instructed to cease work if suspected ACMs are encountered and until sampling can be carried out.







Please refer to ACM Risk Assessment report (access via UNSW EM Asset Management) undertaken by GreenCap NAA (Ref:J123597) which has been prepared for the site and lists specific areas not accessed during the course of the survey.

4.7 ACM Risk register and assigned ratings

The UNSW ACM risk register (see section 4.8 on how to access) lists all identified existing ACM on the campus. Within the register itself, every ACM source identified has been assigned a control priority which identifies how various ACMs are to be treated based on their nature (i.e. friable or non-friable) and risk of exposure. Whenever ACM is removed, the register is updated by UNSW EM. Table 1 outlines the risk rating categories applied to ACMs at UNSW.

Table 1: risk rating for ACMs on the UNSW campus

<p>Priority 1: Hazard with High Risk Potential</p> 	<p>Status: Area has asbestos materials, which 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 with continued unrestricted use of this area.</p> <p>Recommendation: It is recommended that the area is isolated, air-monitoring be conducted (if relevant) and the asbestos material is promptly removed. After abatement of the asbestos material a re-inspection should be conducted to confirm that the area has been satisfactorily cleared of the material.</p>
<p>Priority 2 (P2) : Hazard with Medium Risk Potential</p> 	<p>Status: Area has asbestos materials with a potential for disturbance due to the following conditions:</p> <ol style="list-style-type: none"> 1. Material has been disturbed or damaged and its current condition, while not posing an immediate hazard, is unstable; or 2. The material is accessible and can, when disturbed, presents a short-term exposure risk; or 3. The material could pose an exposure risk if workers are in

	<p>close proximity.</p> <p>Recommendation: Appropriate abatement measures to be taken as soon as is practical (3-6 months). Negligible health risks if materials remain undisturbed under the control of an asbestos materials management plan.</p>		
<p>Priority 3 (P3): Hazard with Low Risk Potential</p> <table border="1"> <tr> <td>P3 - Yellow</td> <td></td> </tr> </table>	P3 - Yellow		<p>Status: Area has asbestos materials where:</p> <ol style="list-style-type: none"> 1. The condition of any friable asbestos material is stable and has a low potential for disturbance; or 2. The asbestos material is in a non-friable condition, however has been damaged, but does not present an exposure risk unless cut, drilled, sanded or otherwise abraded. The damaged bonded material must be removed or repaired by a licenced contractor. <p>Recommendation: Negligible health risks if the materials are left undisturbed under the control of an asbestos material management plan. Consider abatement within 12 months of the damaged bonded asbestos materials (e.g. asbestos cement material).</p>
P3 - Yellow			
<p>Priority 4 (P4): Hazard with Negligible (very low) Risk Potential</p> <table border="1"> <tr> <td>P4 - Yellow</td> <td></td> </tr> </table>	P4 - Yellow		<p>Status: The asbestos material is in a non-friable form and in good condition. It is most unlikely that the material can be disturbed under normal circumstances. Even if it were subjected to minor disturbance the material poses a negligible health risk.</p> <p>Recommendation: These materials should be left and their condition monitored during subsequent reviews</p>
P4 - Yellow			

4.8 ACM risk register access and availability

The UNSW ACM risk register is available to UNSW stakeholders through the following ways:

- Via the UNSW EM (CFM) for the area (see table 5, section 7),
- Through the UNSW Archibus Clean Building Module (*currently being implemented*).

4.9 ACM removal and maintenance program

As of 2015, all known P1 and P2 items as identified through inspection have been removed as part of the UNSW ACM removal program. For P3 and P4 items, given their lower risk and based on consultant advice, the majority are still on campus. The ACM register contains further information as to removal of ACM with removal mostly occurring under the following scenarios:

- a. damaged,
- b. looked to be in a state of disrepair or,
- c. removed as part of a redevelopment/ refurbishment program.

4.10 Labelling

Statutory obligations require ACM needs to be labelled in the workplace (where practical). At UNSW, ACM warning labels have either been affixed to the ACM itself or where practical at the access point to an area containing ACMs to warn personnel.



Figure 18: Label types on the UNSW campus

4.11 Consultation with UNSW stakeholders

As per UNSW consultation arrangements, UNSW EM has open consultation channels with UNSW stakeholders and contractors regarding ACM queries on campus. The process for making an enquiry can be through any of the following ways:

- Contact your local UNSW EM CFM or the UNSW EM asset manager (refer to section 7),
- In the case of building projects, contact the responsible UNSW EM project manager,
- Contact the UNSW HSE unit for assistance.

Where ACM removal is scheduled to occur, UNSW EM consults with local HS representatives, management or other relevant persons to advise on the work planned and proposed controls for ACM removal.

4.12 Reporting of ACM related issues by UNSW stakeholders

In the case a UNSW stakeholder has identified a concern with any ACM (i.e. damage, disrepair), they must immediately report this to UNSW EM and depending on the issue, are advised to liaise with the nearest building warden and/or UNSW security (x56000 or in critical emergencies x56666) to ensure the safety of themselves and others. This may be achieved by:

- advising local staff on situation,
- preventing people accessing the area until EM staff arrive,
- evacuating people where necessary.

UNSW EM will take the necessary steps to then address the problem by consulting a licenced assessor to assist (see table 6).

4.13 Exposure to ACM fibres

In the event where a UNSW stakeholder suspects they may have been exposed to ACM fibres, then a UNSW H20 report (via myUNSW) must be lodged and the issue raised with their supervisor for further action (*refer to [HS713 Guide to reporting hazards and incidents](#) & [HS714 Supervisors guide for managing reported hazards and incidents](#)*)

4.14 ACMs awareness training

To ensure appropriate management of ACM on campus and in accordance with legislative requirements, EM staff are provided with SafeWork NSW approved training to best manage ACM on campus;

- 10314NAT Course in asbestos awareness (nationally accredited course)

4.15 Contractor and consultancy services around ACM work

4.15.1 UNSW ACM removal process

UNSW EM has established a process for the removal of ACM in standalone projects or during a major demolition or refurbishment. Figure 19 outlines this process:

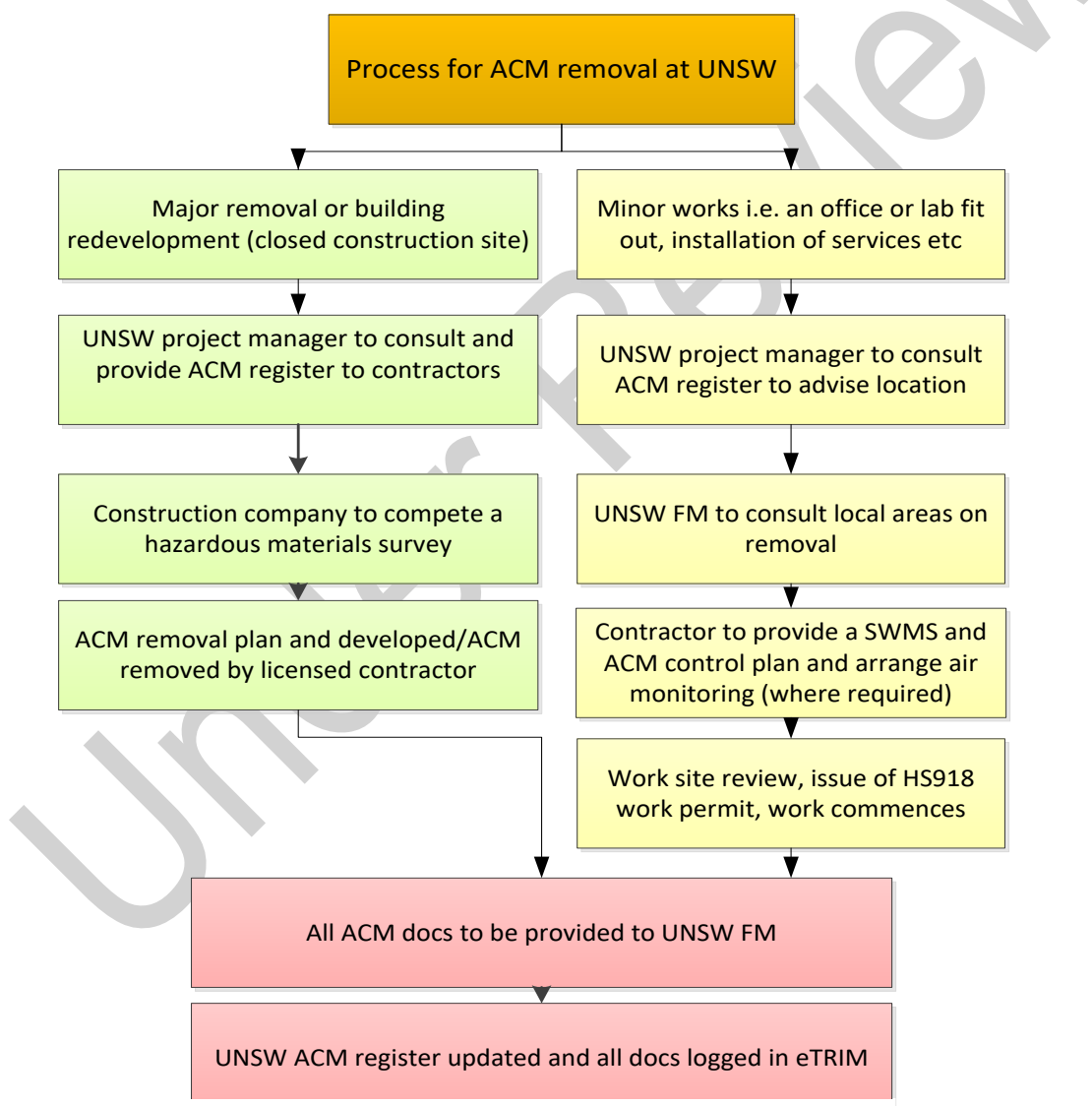


Figure 19: Process for removal of known ACM from UNSW sites

4.16 Building refurbishment, demolition or removal of ACMs

Prior to any proposed refurbishment or demolition works, an ACM demolition survey, scope of works and removal control plan is carried out/developed in accordance with WHS legislative requirements. These documents specify appropriate work procedures and identify any ACMs abatement works required.

4.16.1 Work Authorisation/notification

All works within buildings require authorisation from UNSW EM before starting.

4.16.2 Consultation with local areas

UNSW EM will consult with local areas for any proposed work, shutdowns or other which may impact local area activities. Such consultation arrangements for ACM removal, include:

- ACM type to be removed,
- Time frame for removal,
- Potential impacts to local areas,
- Steps local area will need to take to assist EM for the removal works (i.e. shutdown of equipment, removal of bulky items etc),
- Controls that will be employed by contractors during works.

The above list is not strictly exhaustive, depending on the job there may be other requirements discussed.

4.17 Licenced Contractors

UNSW EM uses suitably qualified independent asbestos consultants/licenced asbestos assessors to manage ACM removal or undertake assessment prior to demolition or refurbishments. Contractors must hold one of the following licences depending on the work they will perform:

- Class A licence for friable works,
- Class B for non-friable works,
- [asbestos assessor licence](#) - to carry out air monitoring, clearance inspections, issue clearance certificates - *where necessary, UNSW EM will engage a licenced asbestos contractor, as prescribed by state legislation, to conduct abatement works.*

4.18 Documentation for removal

For all ACM removal works, contractors are required to implement the following controls (where applicable):

- **SafeWork NSW asbestos removal notification:** all licenced ACM work must submit a SafeWork NSW notification form (NA-01) 5 days before removal,
- **SWMS:** prepare a SWMS, detailing the proposed work methodologies to be used to safely and effectively remove, enclose or encapsulate the ACM (as directed by the UNSW EM);
 - This SWMS must be submitted to UNSW EM and/or the nominated asbestos assessor for review and approval prior to commencing work on site.

- **Removal Control Plan (RCP) and scope of works** (*also refer to Appendix B for reference checklist*): An RCP is required for any licenced asbestos removal work the removalist is commissioned to undertake;
 - The RCP identifies the specific control measures a licence holder will use to ensure workers and other persons are not at risk when asbestos removal work is being conducted. It is similar to a SWMS but is focused on the specific control measures necessary to minimise any risk from exposure to ACM,
 - An RCP helps ensure asbestos removal is well planned and carried out in a safe manner and maintains compliance with the WHS regulations,
- **Permit to work:** Removal works are required to utilise the UNSW HS918 Asbestos Work Permit for asbestos removal, this is required to be displayed at the site,
- **Health monitoring for ACM workers:** PCBU's carrying out ACM work for UNSW must provide details on their health monitoring strategies for their workers. This includes reporting arrangements to SafeWork NSW as required under part 8.5 division 1.

4.19 Provision of ACM information for Contractors

All contractors and maintenance personnel visiting the site must report to the UNSW EM or where applicable the principal contractor office prior to commencing any works. UNSW EM will provide the required information (i.e. register and/or additional risk assessments where applicable) for the site or building, examine the works to be performed and advise on critical issues surrounding proposed ACM work including:

- **ACM locations:** those parts of the buildings that are known to contain ACMs,
- **AMP availability:** that the AMP is available on site to all contractors for reference,
- **ACM register:** that the ACM register provides direction on where known ACMs are,
- **Permit to work process:** work on site is controlled by the UNSW HS918 work permit system, this is to ensure that any ACMs removal has all the required controls in place (see section 4.19),
- **Damaged or previously unidentified ACMs (reporting off):** That during normal, routine maintenance work, all personnel, including external contractors, must report any residual, deteriorating, newly identified or damaged ACMs of which they become aware to the UNSW EM as soon as possible so that the appropriate corrective action can be initiated.

4.19.1 ACM removal general controls

As a general rule, all works removing ACMs require the following:

- Work to be undertaken outside of normal business hours (where possible),

- As per the HS918 Asbestos Work Permit (see section 4.19), isolation of the work area for the following (where necessary);
 - contractor only access, including restricted fire stairs and lift access (with shutdown notices and alternative arrangements made),
 - air conditioning must be switched off or adjusted where risk assessment requires it,
 - isolation of fire sprinkler & smoke detectors (where disturbance is likely), &
 - visually confirming that tenants/staff are not present prior to works commencing (mandatory).
- The use of decontamination measures (i.e. 200µm thick polythene plastic, HEPA vacuums etc) covering surfaces that are likely to be affected by works, including floors, racking, plant and other furnishings,
- The use of appropriate PPE such as:
 - disposable respirators classed P2 or higher (*refer to AS/NZS AS/NZS 1715:2009 & 1716:2012*),
 - disposable synthetic coveralls capable of preventing fibre-penetration (*rated type 5, category 3 (prEN ISO 13982-1)*),
 - eye protection, &
 - appropriate footwear.

A licenced ACM assessor must carry out air monitoring where required, and where applicable, clearance monitoring, clearance inspections and clearance certificates.

4.20 Work Permit System

4.20.1 ACM removal

The HS918 Asbestos Work Permit is required for any ACM removal to ensure works at the site are conducted in a controlled manner. As part of the planning phase between UNSW and the contractor, it must be determined as to who will issue and display it.

4.20.2 Permit retrieval and archiving (post work)

Once the removal work has been completed, the permit must be returned to the UNSW project manager. The project manager will then cross the permit out with the word “EXPIRED” and archive this as per the asbestos record archive process (refer to EM HSE records protocol and Section 6 of this plan).

4.21 Other situations (i.e. non-ACM removal)

There are also situations where certain works are not removing ACM but the potential for disturbance of ACM could occur. In such cases, it is up to the UNSW EM project manager or CFM to discuss with the contractors and determine if the use of the permit will be required. The following information provides further guidance for such cases:

- The ACM register has identified or suspects the presence of ACMs in the area of the proposed works,
- The area where proposed works are to be conducted has not been fully assessed with regard to the presence of ACMs and other factors such as age of the building etc suggest ACM is likely to be present.
 - UNSW EM will discuss with contractors working near ACM the necessary controls needed to prevent potential damage;

- the location of known ACMs as determined through the UNSW ACM register,
- labelling in local areas and through consultation with EM asset management,
- isolation of area and services where required.
 - Contractors must notify UNSW EM if they notice ACMs in their work area are in poor condition or if there are suspected ACMs that may not be on the register.

4.22 Asbestos fibre air monitoring

4.22.1 Why air monitoring is required

Air monitoring detects airborne asbestos and mineral fibre dust small enough to be inhaled into the lungs, termed respirable asbestos dust. Respirable dust is minute, invisible to the naked eye, and is implicated in causing harm to lung tissues. A human hair is between 40 to 80µm in thickness, in comparison respirable asbestos fibres known to cause harm are less than 1.5 - 2µm in diameter and longer than 5 - 10µm in length.

4.22.2 When air monitoring is required

Air monitoring requirements will vary depending on the type of ACM being removed. Such factors include the location and position of the ACM, if an enclosure is used and whether the ACM removal work is within a building or outside.

- **Friable asbestos removal:** air monitoring is mandatory for all friable ACM removal. This includes prior to dismantling an enclosure and for the purposes of the clearance inspection. In cases where friable material is encapsulated *in situ*, (i.e. within a fire door) then the asbestos assessor can use risk management to determine the use of air monitoring strategies,
- **More than 10 m² of non-friable asbestos removal:** air monitoring is not required but may be considered to be carried out by an independent licenced ACM assessor or competent person to ensure compliance with the duty to eliminate or minimise exposure to airborne ACM and to ensure the exposure standard is not exceeded,
- **Public Location:** air monitoring needs to be in place where the ACM removal work is being undertaken in or next to a public location,
- **Exposure air monitoring:** air monitoring should be carried out at other times to determine a worker's exposure to airborne asbestos if, based on reasonable grounds, there is uncertainty as to whether the exposure standard may be exceeded and a risk assessment by a competent person indicates it is necessary. Since most uses of ACM are prohibited, exposure monitoring should not be required frequently.

4.22.2.1 Air monitoring may also be required when:

- it is not clear whether new or existing control measures are effective,
- there is evidence (for example, dust deposits are outside the enclosure) the control measures have deteriorated as a result of poor maintenance,
- modifications or changes in safe work methods have occurred that may adversely affect worker exposure,
- there has been an uncontrolled disturbance of ACM at the workplace.

4.22.3 Who will conduct monitoring

Where air monitoring is required, it will be conducted by a licenced asbestos assessor during the removal of ACMs. UNSW EM may also require air monitoring during the removal of, or work on, non-friable/friable asbestos products. The requirements and agreed arrangements for air monitoring is required to be established prior to commencement of ACM related works at UNSW. All air monitoring is conducted by a NATA accredited laboratory.

4.22.4 Analysis of air monitoring

UNSW requires that air monitoring analysis be undertaken by a suitably experienced and competent consultant and that results be analysed in a laboratory accredited by the National Association of Testing Authorities, Australia (NATA). Monitoring must be undertaken in accordance with the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres* [NOHSC:3003 (2005)].

4.22.5 Concurrent Works

Due to the sensitive nature of ACM removal and air monitoring, it is required that any works that are likely to create high levels of dust are not be undertaken during air monitoring. These works include plastering and sanding of internal partition walls and are likely to cause excessive dust levels that may void asbestos fibre air monitoring results or cause unnecessary concern to stakeholders (filters with excessive dust loading should be voided in accordance with NOHSC:3003 (2005)).

4.22.6 Transport and disposal of ACM waste

Waste containing ACM must be stored and transported in a receptacle designed to prevent the release of its contents. This can include the use of standard 200µm thick clear polythene labelled waste bags or suitably sealed and labelled drums. The transportation and disposal of ACM waste is regulated by the *Protection of the Environment Operations (Waste) Regulation 2005* are made for asbestos waste under Schedule 1, Part 3, Division 2, Section 29 of the Regulation.

Waste disposal dockets will be collected from the contractor for record keeping purposes. These will be obtained by UNSW EM and kept in accordance with section 6 of this plan.

4.23 SafeWork NSW

SafeWork NSW administers and enforces the ACMs related state legislation. The *Work Health and Safety Regulation 2011 (NSW)* require 'Duty Holders' of premises to identify, assess and control risks arising from ACMs in buildings. The *Work Health and Safety Act 2011 (NSW)* also details the overriding general obligation of various parties including employers, self-employed persons and persons in control of workplaces to ensure the workplace health and safety of persons affected by their work activities. Combined, the Act and Regulation essentially require the implementation of an AMP. SafeWork NSW inspectors may request access to ACMs related documentation from time to time. The *Work Health and Safety Act 2011 (NSW)* outlines the powers of inspectors.

5 EMERGENCY MANAGEMENT

5.1 Emergency Procedures

Emergency procedures have been established for the following scenarios:

- Accidental disturbance or release of ACMs during removal,
- Elevated results as determined through air monitoring.

If any ACM-related emergency arises that is not listed above, a consultant will be contacted immediately for further instructions. In the event of any other emergency (*i.e. fire*), the existing emergency procedures for the site will be followed. As a general rule, normal decontamination/isolation procedures outlined elsewhere in this document can be temporarily waived during emergencies where life is immediately in danger.

5.2 Notification to SafeWork NSW

In the event of both the accidental disturbance of ACMs or high results during asbestos-fibre air monitoring, SafeWork NSW may need to be notified as per notifiable reporting requirements under Part 3 of the WHS Act, 2011.

5.3 Accidental ACM disturbance or release during removal

In the event that an activity causes the accidental disturbance or dispersal (during removal) of ACMs, Table 2 outlines the required steps to be followed:

Table 2: steps to take in an ACM related emergency

Step	Process	Who	Steps / Notes
1	Potential ACM product is disturbed ↓	Management UNSW EM and local area	Remove personnel from areas considered to be at risk in relation to ACM exposure. Go to Step 2.
2	Remove personnel from areas and restricted access to area ↓	Management UNSW EM	Access to the area should be controlled and sign posted to prevent unauthorised persons entering the disturbance area. Go to Step 3
3	Shut down air conditioning system ↓	Management UNSW EM	The air handling system should be shut-off and/or temporarily modified to prevent the distribution of fibres from the area to other areas in the building (if relevant). Go to Step 4.

4	<p>Contact asbestos assessor & asbestos removalist</p> <p style="text-align: center;">↓</p>	<p>Management UNSW EM, Licenced Asbestos Assessor/ Consultant & Licenced Asbestos Removal Contractor</p>	<p>UNSW EM will organise a licenced ACM consultant to confirm the presence of ACM-containing materials and to advise on appropriate control strategies. Follow advice from the assessor/consultant, engage a licenced asbestos removal contractor to undertake asbestos clean-up works.</p> <p>Go to Step 5.</p>
5	<p>Conduct inspection & clearance air monitoring</p> <p style="text-align: center;">↓</p>	<p>Licenced Asbestos Assessor/ Consultant</p>	<p>ACM fibre air monitoring may be required outside the area of the asbestos contamination whilst clean-up works are being conducted to monitor airborne fibre concentrations (where applicable).</p> <p>Go to Step 6.</p>
6	<p>Conduct inspection & clearance air monitoring</p>	<p>Licenced ACM Assessor & Management UNSW EM</p>	<p>After clean-up works have been completed, fibre air monitoring (where applicable) shall be conducted in the affected area to ensure that levels are at an acceptable level (<i>i.e.</i> <0.01 fibres/ml). Only when the asbestos level is acceptable and the clean-up works have been conducted to a satisfactory standard and a clearance certificate has been issued, shall personnel be allowed to reoccupy the affected area.</p>

5.3.1 Emergency procedures for elevated air monitoring results

The following outlines the control levels for asbestos fibre air monitoring and the necessary actions required in accordance with statutory obligations.

Table 3: Control (Static) Monitoring During Works

Control Level (fibres/mL)	Who	Control / Action
< 0.01	-	No action - continue with existing control measures.
≥ 0.01	UNSW EM & licenced assessor/consultant	Licenced assessor/consultant to notify removal contractor and UNSW EM of results as soon as is practicable. Management UNSW EM to notify applicable contractor (<i>i.e. the contractor who is undertaking the works that have resulted in the reading</i>).
	UNSW EM & licenced ACM assessor /consultant	Licenced ACM assessor & UNSW EM to review current control measures and improve, where applicable. This may include improved work practices, use of further control measures (e.g. plastic screening or wet wiping techniques) or changing the work methodology.
> 0.02	UNSW EM / Licenced assessor	Licenced assessor to notify UNSW EM of results as soon as is practicable. UNSW EM to notify applicable contractor (<i>i.e. the contractor who is undertaking the works have resulted in the reading</i>) to stop works immediately . UNSW EM to restrict access to the affected area. UNSW to notify SafeWork NSW of air monitoring results via form NAF-01
	Licenced assessor/consultant UNSW EM	Licenced assessor/consultant to conduct investigations to establish cause of problem. Following advice from the ACM consultant, UNSW EM to arrange improvement works. Licenced assessor/consultant to advise on necessary works to rectify problem. Additional air monitoring to be conducted by /ACM assessor / consultant. Contractors will be allowed to return to area after results are <0.01 fibres/ml.

Table 4: Clearance Monitoring

Control Level (fibres/mL)	Who	Control / Action
< 0.01	-	Clearance can be issued by licenced consultant/ assessor.
≥ 0.01	UNSW EM & licenced assessor/ consultant	ACM assessor to notify UNSW EM of results as soon as is practicable. UNSW EM to notify applicable contractor (<i>i.e. the contractor who is undertaking the works that have resulted in the reading</i>).
	UNSW EM Licenced assessor/ consultant	Licenced assessor to conduct investigations to establish cause of problem. Following advice from the ACM consultant, UNSW EM to engage removalist to undertake any necessary improvement works. This may include further works such as increased HEPA vacuuming or wet wiping techniques. Additional air monitoring to be conducted by ACM consultant/asbestos assessor. Clearance can be issued after results are <0.01 fibres/ml.

6 RECORDS MANAGEMENT

6.1 Records and documentation

All records for ACM work and activities are kept on file/archived in accordance with the EM HSE records management protocol and HS733 Health & Safety Records Procedure, such records include (but not limited to):

- **ACM management**
 - Records of re-inspections and review of the AMP;
 - Reports of inspections by an ACM consultant;
- **ACM removal**
 - Clearance certification and air monitoring reports;
 - Expired HS918 work permits;
 - Scope of works,
 - Removal control plans
 - SWMS
 - Waste disposal dockets resulting from removal works.
- **ACM incidents**
 - Reports of accidental damage and clean-up procedures;
 - SafeWork NSW notifiable incident reports
 - UNSW incident reports
- **Contractor details**
 - Details of licenced contractors used;
 - Details of contractor consultation;

6.2 Records storage/archive process (EM use only)

All ACM related records will be stored in eTRIM in accordance with the UNSW [HS733 Health & Safety Records Procedure](#).

The record archiving process for Asbestos records is under the following process:

- STEP 1: Asbestos work is undertaken;
- STEP 2: All relevant documents (refer to Appendix A) collected for each job;
- STEP 3: Once documents have been received and work completed, documents renamed under the following naming convention:
- Document type: Building: Date
 - For example, if a removal job occurs within Biological Sciences on the 1/1/2016, then the HS918 removal permit it would have the following name assigned:
 - HS918 permit: D26: 01012016
- STEP 4: Log into eTRIM, type in Asbestos into the equal to field. Scroll down to the EM Super Folder (#Ref WOR15-0012);
- STEP 5: Open the folder and select the building where the file(s) need to go;
- STEP 6: Drag and drop file into the folder;
- STEP 7: Assign yourself as the author;
- STEP 8: Update Archibus (refer to Section 6.3).

6.3 Updates to the asbestos register (EM use only)

- STEP 9: Log into Archibus;
- STEP 10: Click Environmental and risk assessment option;
- STEP 11: Click environmental hazard manager;
- STEP 12: Click manage hazard assessment items;
- STEP 13: Select Asbestos register;
- STEP 14: Select edit;
- STEP 15: Click Update “Asbestos present” field to “abated”;
- STEP 16: In material notes section, type in the eTRIM reference folder (building level).
For example, if you do a job for Biological Sciences, then type in the following: Asbestos removal records in eTRIM folder 2015/36827.

6.4 Records access

ACM records are stored with UNSW EM. Information on records location may be requested by contacting EM asset management (see table 5).

7 CONTACTS

This section lists the various contacts that need to be consulted for issues around ACM.

Table 5: UNSW EM asset management contacts

Name	Title	Area of management	Contact	Office
Gary Mulligan	Senior Manager	Facilities Management	0414 385 833	9385 3967
EM Assist	NA	Emergency or general enquiries		9385 1111

Table 6: Other Contact Numbers

NSW Waste Service Booking Line	-	1300 651 116
NSW SafeWork NSW	92-100 Donnison Street, GOSFORD NSW 2250	13 10 50

8 REVIEW HISTORY

Version	Authorised by	Approval date	Effective date	Sections modified
1.0	Associate director, UNSW Asset Management	April 2013	April 2013	New doc.
1.1	Associate director, UNSW Asset Management	September 2015	September 2015	Major formatting
1.2	FM contacts changed Records management process added to section 6.2	April 2016	April 2016	Minor changes
1.3	Minor changes, EM HSE Coordinator	(pending)	(pending)	Whole document

APPENDIX A - Removal of ACM, important documents for each job

UNSW Documents

- Consultation with the UNSW ACM register

Contractor competencies required for removal (where applicable)

- [Class A](#) - to remove friable asbestos
- [Class B](#) - to remove non-friable asbestos
- [asbestos assessor licence](#) - to carry out air monitoring, clearance inspections, issue clearance certificates
- Training in [10314NAT Course in asbestos awareness](#) (nationally accredited course)
- Training [10559NAT - Course in Working Safely with Asbestos Containing Materials](#)

SafeWork NSW Notification

- SafeWork NSW NA-01 form authorisation required for licenced works

Removal and clearance documents to be collected for each job

- HS918 Asbestos Work Permit to work
- Scope of works & removal control plan (also see appendix B)
- SWMS for removal
- Air clearance certificates (where applicable)
- Disposal receipts or dockets

APPENDIX B - ASBESTOS REMOVAL CONTROL PLAN REFERENCE CHECKLIST

Source: CODE OF PRACTICE | HOW TO SAFELY REMOVE ASBESTOS

NOTIFICATION	
<ul style="list-style-type: none"> Details on notification process to SafeWork NSW and local area 	<input type="checkbox"/>
IDENTIFICATION	<input type="checkbox"/>
<ul style="list-style-type: none"> Details on ACM to be removed for the project (<i>based on register or other information</i>) 	<input type="checkbox"/>
PREPARATION	<input type="checkbox"/>
<ul style="list-style-type: none"> Assigned responsibilities 	<input type="checkbox"/>
<ul style="list-style-type: none"> Program commencement and completion dates 	<input type="checkbox"/>
<ul style="list-style-type: none"> Emergency plans 	<input type="checkbox"/>
<ul style="list-style-type: none"> ACM removal boundaries 	<input type="checkbox"/>
<ul style="list-style-type: none"> Use of signs and barriers 	<input type="checkbox"/>
<ul style="list-style-type: none"> Control of other hazard such as electrical etc 	<input type="checkbox"/>
<ul style="list-style-type: none"> PPCE 	<input type="checkbox"/>
REMOVAL	<input type="checkbox"/>
<ul style="list-style-type: none"> Details on permit to work 	<input type="checkbox"/>
<ul style="list-style-type: none"> Details of air monitoring strategy 	<input type="checkbox"/>
<ul style="list-style-type: none"> Waste and storage disposal 	<input type="checkbox"/>
<ul style="list-style-type: none"> Method of removal (i.e. wet or dry) 	<input type="checkbox"/>
<ul style="list-style-type: none"> ACM removal equipment 	<input type="checkbox"/>
<ul style="list-style-type: none"> Details of required enclosures – size, shape, structure, smoke testing, negative pressure exhaust units 	<input type="checkbox"/>
<ul style="list-style-type: none"> Details of temporary blds required (where necessary) 	<input type="checkbox"/>
<ul style="list-style-type: none"> Details of the measures to prevent release of airborne fibres 	<input type="checkbox"/>
WASTE DISPOSAL	<input type="checkbox"/>
<ul style="list-style-type: none"> Method for containment and transport of ACM 	<input type="checkbox"/>
<ul style="list-style-type: none"> Deposal of PPCE 	<input type="checkbox"/>
<ul style="list-style-type: none"> Structures used to enclose ACM 	<input type="checkbox"/>
CLEARANCE & AIR MONITORING	<input type="checkbox"/>
<ul style="list-style-type: none"> Details on independent licenced ACM assessor or competent person to do air monitoring 	<input type="checkbox"/>
CONSULTATION	<input type="checkbox"/>
<ul style="list-style-type: none"> How consultation arrangements will be managed with local area, UNSW EM and other 	<input type="checkbox"/>