

Dealing with Asbestos in Soil during Redevelopment of Existing Public Hospital Facility

Health Infrastructure Stakeholder Workshop –
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Joanne Rosner
NSW Managing Principal – Contaminated Land
JBS&G

jrosner@jbsg.com.au



Introduction / Overview of Presentation

1. Asbestos contamination in soil
2. Regulatory frameworks
3. NSW EPA notification triggers – asbestos in soil
4. Assessment of asbestos in soil – practical guidance
5. Approvals / Licensing process – remediation
6. Remedial Action Plans (RAPs)
7. Asbestos Management Plans (AMPs)
8. Monitoring Requirements
9. Site Validation vs Hygienist Roles – Procurement / Packaging
10. Final site clearance / validation / audit



Common Types of Asbestos in Soil

Types:

1. Bonded Asbestos Containing Materials (ACM), asbestos is bound in cement or resin – e.g., asbestos sheeting/pipes and vinyl tiles.
2. Fibrous Asbestos (FA), friable asbestos – e.g., insulation (lagging), severely degraded ACM, woven asbestos materials.
3. Asbestos Fines (AF), free fibres, fibre bundles and <7 mm ACM.



Note: AF/FA are 'friable' as per WHS terminology.



Common Sources of Asbestos in Soil – existing hospital redevelopment

Common Sources:

- Weathered / damaged building cladding (pre & post demolition)
- Old formwork around pavements / footings
- Underground services – pipework and pits
- Garden materials – mulch and old retaining walls
- Former burial pits (previous demolition rubble)
- Imported fill material (containing demolition rubble)



Regulatory Frameworks – Asbestos in Soil

Two frameworks, slightly different focus:

1. Contaminated Land Framework – making site suitable
2. WHS Framework – making workplace safe

1. Contaminated Land Framework

NSW Contaminated Land Management Act 1997 (CLM Act)

CLM Act allows NSW EPA to 'make or approve guidelines'

Guidelines relevant to asbestos in soil are:

- National Environment Protection (Assessment of Site Contamination) Measure (NEPC 2013)
- Guidelines on the Duty to Report Contamination (EPA 2015)



Regulatory Frameworks – Asbestos in Soil

The introduction of NEPC 2013 significantly changed the way asbestos – and in particular ACM – is remediated at contaminated sites.

1. 'Zero tolerance' to ACM was replaced with %w/w criteria
2. 'Zero tolerance' to visible asbestos became limited to surface only
3. Explicitly established asbestos-specific 'preferred' remediation approaches, namely to:
 - ✓ Minimise public risk
 - ✓ Minimise soil disturbance
 - ✓ Minimise volumes going to landfill

Importantly, asbestos in soil is different to asbestos in buildings, where conventional approach is to completely remove then proceed with works. NEPC 2013 recommends minimal disturbance and managing soil 'in situ'.



Regulatory Frameworks – Asbestos in Soil

Notification Triggers to NSW EPA – asbestos in soil (EPA 2015)

Friable asbestos is present;

AND

The level of asbestos in an individual soil sample exceeds 0.001% (NEPC 2013)

AND

A person has been or foreseeably will be exposed to elevated levels (>0.01 fibres/ml) of asbestos fibres by breathing them into their lungs.

Not intended to capture bonded ACM or naturally occurring asbestos.



Regulatory Frameworks – Asbestos in Soil

2. WHS Regulatory Framework

- (1) prohibits work involving asbestos
- (2) 'involves' includes 'handling' and 'disturbing' asbestos or ACM
- (3) provides exceptions for sampling, removal/disposal and transport, if in accordance with the regulations
- (4) provides exception, "if the regulator approves the method adopted for managing risk associated with asbestos"



Regulatory Frameworks – Asbestos in Soil

- WHS Regulations (cont'd)
 - (5) provides exception for, “soil that a competent person has determined:
 - Does not contain any visible ACM or friable asbestos; or
 - If friable asbestos is visible, does not contain more than trace levels determined as per AS4964:2004
 - (5) provides exception for naturally occurring asbestos managed in accordance with an asbestos management plan.



Regulatory Frameworks – Asbestos in Soil

Subtle differences in Contaminated Land vs WHS guidance:

- ‘No visible ACM’ vs %w/w ACM in soil based on intended landuse.
- No visible asbestos on surface (contaminated land) is consistent with WHS ‘no visible asbestos’
- Where friable asbestos is present, WHS references 0.1 g/kg reporting limit in AS4926:2004 vs 0.001% w/w in NEPC 2013.
- NATA has issued advice to laboratories about reporting asbestos <0.1 g/kg.
- WA DoH has issued guidance to use ‘weight of evidence’ approach including reliance on laboratory data <0.1 g/kg.



Assessing Asbestos in Soil – practical advice

Some key practical guidance when assessing asbestos in soil:

- Use a competent person as defined in both NEPC 2013 and WHS regs.
- Wherever possible, use test pits not boreholes.
- Submit 500 mL samples for analyses to NEPC 2013 criteria, not 40 g presence/absence analyses.
- Analyse for asbestos in soil even when there is a remote possibility that it may be present, as it is a common contaminant in soil at hospitals.
- Do not adopt a 'can't observe ACM therefore no laboratory analyses'. Hospital site means it's likely to be there and must know about it before you commence redevelopment works, rather than after.



Approvals Process / Licensing Process – soil remediation

Project approval/consent – SEPP55 (remediation of land) applies.

Two types of remediation works:

- Category 1 Consent required.
- Category 2 Consent not required.

Common triggers for remediation to require consent (Category 1):

- >3 Ha of site area to be disturbed by the remediation works
- >30,000m³ of contaminated soil requiring remediation (capping is remediation)
- Heritage / Flooding triggers

Regardless of the category of remediation works, the land must be suitable or be able to be made suitable as part of the broader project approval/consent. Hence Remedial Action Plan (RAP) required as part of the approvals documentation.



Approvals Process / Licensing Process – soil remediation

Friable asbestos remediation:

- AS(A) Friable contractor and SafeWork NSW notification prior to commencement.
- Licensed Asbestos Assessor (LAA) to undertake monitoring and clearance work, independent of licensed removalist / remediation contractor.

On site capping/containment of asbestos impacted soil:

- Waste facility licensed not required where soils originate from within 'the site'. i.e., an on-site capping/containment cell to retain asbestos impacted soils on site does not need an EPA licence.



Preparing a Remedial Action Plan (RAP)

RAP preparation:

The RAP is the primary remediation guidance document.

Important the RAP follows NEPC 2013 guidance, namely:

- Minimise soil disturbance
- Minimise off-site landfill disposal
- On-site management preferred

Need clear validation rules, to ensure the site is suitable.

Where capping/containment is the approach, validation relies heavily on:

- Survey levels
- Material tracking and importation verification

Often not possible to 'validate' site suitability until building and surrounding pavements/landscaped areas are complete.

A long term Environmental Management Plan (EMP) is required where asbestos is capped/contained.



Asbestos Management Plan – Code Compliance

Code of Practice: How to Manage and Control Asbestos in the Workplace

Section 5.2 Contaminated Sites:

- Sites contaminated with asbestos become a workplace when work is carried out there
- An asbestos register and *asbestos management plan* must be created for the site
- Recognises specialised nature of contaminated sites, refers to NEPC 2013
- Recognises that complete removal of asbestos / ACM may be impractical and other strategies should be used.



Asbestos Management Plan – alignment with the Remedial Action Plan

Ensuring AMP aligns with RAP

- Impractical/impossible, to require complete visual clearance prior to remediation works progressing. Asbestos will re-appear in soil following conventional visual 'clearances', so controls/monitoring are required.
- Awareness/induction training required.
- Occupational Hygienist to be on-site to address unexpected/expected finds of asbestos
- Ensure different 'tiers' of controls depending on the different forms of asbestos present and the different risk profiles (i.e., bonded vs friable).
- Where risk-based 'tiered' controls adopted, align with RAP site suitability criteria for ACM and AF/FA.



Dealing with asbestos during hospital remediation and redevelopment

Application of NEPC 2013 asbestos criteria impacts on the previous general convention of remediation occurring on hospital redevelopment sites:

- Remediation and construction now occur more in tandem/parallel rather than in sequence, and validation/clearance prior to construction no longer means 'no asbestos'
- Pre NEPC 2013, remediation, 'no asbestos' validation/clearance, followed by construction on a 'clean' site
- Post NEPC 2013, remediation of >0.1 m materials to %w/w, partial validation, construction, topsoiling/landscaping 0.1 m layer, final validation



Dealing with asbestos during hospital remediation and redevelopment

Dust Monitoring and Asbestos Monitoring

Dust monitoring (NEPC 2013 / DoH 2009) provides real-time data, allows dust emissions to be controlled to protect worker/community health.

Asbestos air monitoring provides 'end of day' / 'next day' data, required for certain works under WHS regs / Codes of Practice.

Both are useful. Can be complementary and provide multiple 'lines of evidence'.



Dealing with asbestos during hospital remediation and redevelopment

Roles/Responsibilities and Procurement Model

For hospitals, procurement model works best when:

- Validation Role (Remediation Consultant) retained by Principal (HI).
- Occupational Hygienist Role packaged into contractor role. Manages day to day risks to construction workers.
- Remediation consultant directs remediation extents. Where packaged with contractor, HI has less control over remediation quantities. Also tighter control/better risk protection on importation of impacted materials due to sub-standard 3rd party 'certification'.



Dealing with asbestos during hospital remediation and redevelopment

NSW EPA Accredited Site Auditor Role

Site Auditor certifies that the hospital site (the land, not the building) is suitable for its use following remediation.

The Site Auditor independently reviews the work of the Remediation Consultant and Contractor to produce a Site Audit Statement (SAS) and Site Audit Report (SAR).

The Site Auditor must be independent and cannot design the investigation or remediation program.





Targeting Risk and Risk Management Hazardous Building Materials in Structures

Daniel Saunders - Senior Associate Environment
November 2016

Content – HBM in Structures

- **What is the Hazard?**
- **What is the Risk?**
- **What is the Control?**
- **Regulative Setting**
 - Agencies
 - Acts & Regulations
- **Project lifecycle Hazardous Building Material (HBM) risk management**
 - Operational and Management
 - Tendering and Procurement
 - Design and Construction

- **Work Health and Safety Regulations 2011**

- Asbestos
- Lead in paint
- Synthetic Mineral Fibres
- Polychlorinated Biphenyls

This presentation focusses on Asbestos

Hazardous Building Material (HBM) surveys include more than just Asbestos!

- **What is Asbestos?**

- Asbestos is a naturally-occurring fibrous silicate mineral
- Asbestos containing materials are described as either “**non-friable**” or “**friable**”
- Disturbing or removing it unsafely can create a hazard

- **Occurrence**

- Asbestos has been used in more than 3000 products
- Mined in Australia until late 1984.
- Between 1930 and 1983, approximately 1.5 million tonnes of all forms of asbestos was imported into Australia.
- Approximately one third of all homes built in Australia contain asbestos products
- Asbestos is still widely used in some countries and may occur in imported goods

Source: Asbestos Safety and Eradication Agency, 2016

What is the Risk?

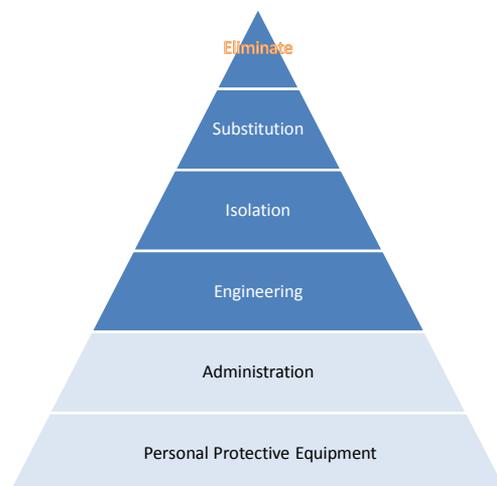
- **Health risk in the built environment:**
 - Most people can't tell whether building materials contain asbestos just by looking at them
 - If asbestos fibres are in a stable material and in good condition they may pose little health risk
 - However where sheeting is broken, damaged or mishandled fibres can become loose and airborne posing an elevated risk to health.

Hierarchy of hazard control

Hard Controls

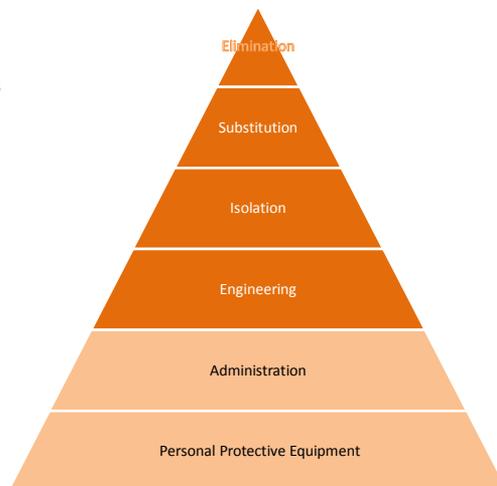


Soft controls



- **Work Health and Safety:**
 - Work Health and Safety Act 2011
 - Work Health and Safety Regulation 2001

- **Asset maintenance**
 - Repurposing of facilities
 - Servicing of plant
 - Plant replacement
 - Decommissioning



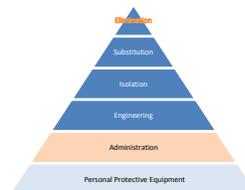
- **Roles and Responsibilities (Operational)**

In situ Asbestos management:

- SafeWork NSW
 - Licensed asbestos assessors
 - Workplaces
- Local Council
 - Domestic premises and non-work places

- **Who has duties to manage and control asbestos or HBM?**

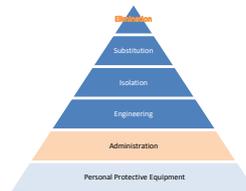
- Person Conducting Business or Undertaking (PCBU)
- PCBU with management or control of a workplace
- PCBU carrying out demolition or refurbishment work



- **More than one PCBU on a site?**

This person will usually be the owner of the workplace or a representative of the owner and may:

- Own the workplace and engage workers to carry out work there
- Own the workplace but lease it to another person conducting a business or undertaking at the workplace
- Have management or control over the workplace, for example a property management group or agent.



- **PCBU with management or control of a workplace**

Design and construction specification must be seeking details on:

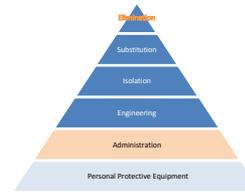
- Identifying asbestos or ACM by a competent person
- Identify presence and location of asbestos or ACM
- An Asbestos Register is to be readily available to workers
- An Asbestos Management Plan where asbestos has been identified at the workplace
- Naturally Occurring Asbestos (NOA) if relevant
- Demolition and Refurbishment Work methodology



- **Asbestos Register**

The asbestos register must have:

- Record any asbestos that has been identified or is assumed to be present at the workplace
- Record the date when the asbestos was identified
- Record the location, type and condition of the asbestos
- Be maintained to ensure up-to-date information
- State if no asbestos has been identified
- Be given to the employer or business (or other PCBU), when there is a change of management or controller of the workplace.



What is the hazard?



What is the hazard?

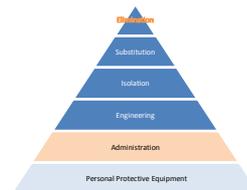


Operational

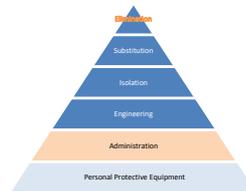
- **Asbestos Management Plan**

The asbestos management plan must:

- Identify location
- Management of asbestos at the workplace, control measures
- Outline procedures for incidents and emergencies involving asbestos
- Be maintained with up-to-date information
- Up-to-date information and reviewed every 5 years
- Be accessible to any worker or the PCBU
- Provide information, consultation and training responsibilities to workers



- **Identifying if asbestos or ACM is at the site:**
 - Request the most recent Asbestos Site Management Plan / Register
 - Engage a competent person to review coverage and survey consistency between existing and proposed works
 - Specify early works to include a detail and intrusive survey to confirm



The Asbestos register is to inform the project design:

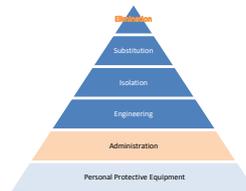
- **Heritage**
 - Adaptive Reuse
- **Structural soundness**
 - Dilapidation survey
 - Fire engineering
 - Maintenance
- **Utilities**
 - Asset protection
- **Civil**



- **Tendering and Procurement as a PCBU**

Specifications must be seeking details on:

- Control risk exposure
- Health monitoring of workers
- Training
- Controlling use of equipment
- Asbestos related works methodology for control and measures
- Verification of removal



What is the Risk?





SMEC

Local People. Global Experience.

Adaptive Reuse – ACM Register



SMEC

Local People. Global Experience.

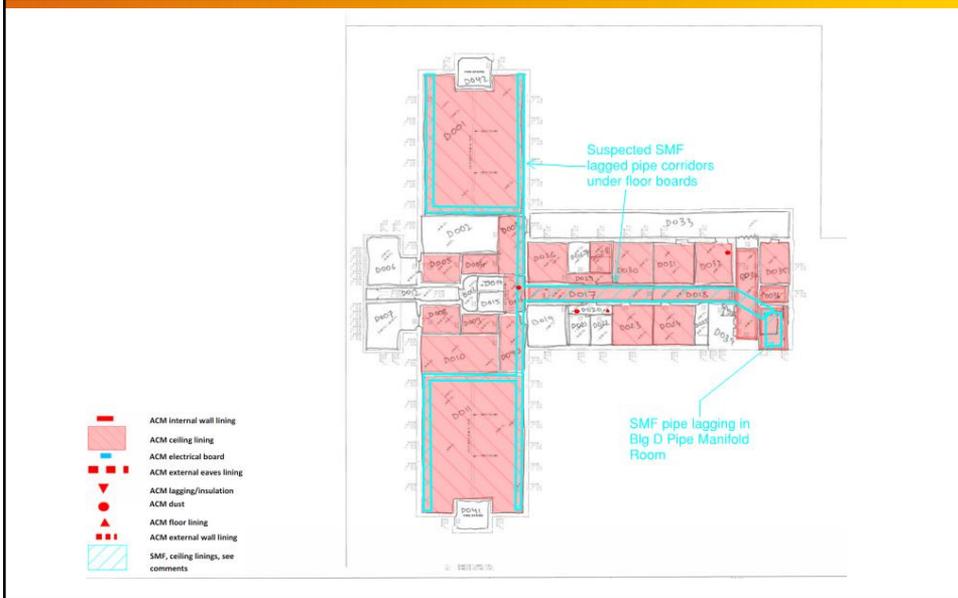
Adaptive Reuse – ACM Register





Local People. Global Experience.

SMC Adaptive Reuse – ACM Register



Local People. Global Experience.

Construction

- **PCBU carrying out demolition or refurbishment work**

Works must not commence until the following has been completed:

- Has the asbestos register for the workplace
- If no register, works to be inspected by a competent person
- A licensed asbestos removalist must prepare an asbestos removal control plan for any licensed asbestos removal work they are commissioned to undertake.
- Notifying the regulator of the licensed asbestos removal work
- Removal area has controlled access
- If an emergency occurs, ensure there is a procedure to reduce the risk of the exposure to asbestos to below the exposure standard and notify the regulator about the emergency.
- Register to be revised

- **Environmental Protection:**
 - Protection of the Environment Operations Act 1997
 - Protection of the Environment Operations (General) Regulation 2009
 - Protection of the Environment Operations (Waste) Regulation 2005
 - Contaminated Land Management Act 1997
 - Environmental Trust Act 1998
 - Dangerous Goods (Road and Rail Transport) Regulation 2014

- **Roles and Responsibilities (Construction)**
 - Asbestos Removal:
 - SafeWork NSW
 - All Licensed removal work and asbestos assessors
 - At a workplace not requiring a licensed removal contractor
 - At domestic premises by a person concerned in business or undertaking
 - At domestic premises requiring a licensed removal contractor
 - Local Council
 - At domestic premises – all other cases

- **Roles and Responsibilities (Construction)**

- Asbestos Transport and disposal:

- SafeWork NSW
 - Temporary on-site waste storage – workplaces
 - NSW EPA
 - Transport by vehicle
 - Licensed waste storage or recycling facilities
 - Landfill facilities
 - Illegal disposal (and Local Government)

- **Roles and Responsibilities (Construction)**

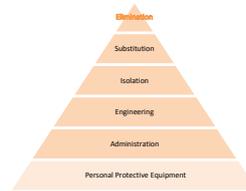
- Supply:

- SafeWork NSW
 - Illegal supply
 - Australian Customs & Border Protection Service
 - Illegal import or export

- **Works area are not considered clear until:**

An independent competent person provides a clearance certificate to show:

- Asbestos removal area and the area immediately surrounding are free from visible asbestos
- Air monitoring (if conducted) < 0.01 fibres/ml
- Disposal of asbestos waste in accordance with EPA requirements



- **Take home message :**

- Hierarchy Hazard Risk process applies to all stages of tendering
- Does the existing HBM register represent your current operation?
- Is existing HBM knowledge sufficient for the proposed adaptive reuse
- Do the designers know your register as well as you do?
- Do the contractors know your register as well as you do?
- Once project is completed, update your register