Office of Industrial Relations
Workplace Health and Safety Queensland

# Containment and disposal of asbestos contaminated dust and debris arising from fire damaged buildings

Guidance note

Queensland Government

# 1. Purpose

This guidance note provides information for Queensland regulatory agencies, emergency services, fire investigators, environmental and occupational hygiene consultants, contractors and members of the community on management of fire damaged buildings that have asbestos containing materials (ACMs).

# 2. Scope

This guidance note covers the containment, decontamination and removal of asbestos contaminated dust and debris (ACD) arising from fire damaged buildings, including workplace buildings and domestic premises.

# 3. Introduction

Buildings constructed before 1990 are likely to contain asbestos materials. Most ACMs found in domestic and commercial buildings are bonded (non-friable) products such as floor tiles, flat fibre cement sheeting (fibro) used in walls and ceilings, and corrugated roofing. Some decorative textural wall and ceiling finishes also contained asbestos. The most common type of friable material used in domestic premises in Queensland was the underlay of sheet vinyl flooring.

Some pre-1990 commercial buildings may contain friable materials such as sprayed on asbestos insulation and fire retardant materials. Items of plant and equipment constructed and installed prior to 31 December 2003 may also contain ACMs. Examples include within fire doors, components of lift motors, generators, gate valves, boilers, rope seals and gaskets. Unlike domestic buildings, a register of the location and type of asbestos should be available for a workplace building.

To cause a health risk, asbestos fibres must not only be released into the air, but must also be of a sufficiently small size and be breathed in sufficient quantities to cause a risk to human health. Testing and monitoring of airborne asbestos fibres during and after fires indicates that airborne fibres are not generated in significant quantities, and do not exceed typical background levels once the fire is extinguished.[1,2]

This guidance note provides practical advice on safely managing the structure, and ACD that may be present following a fire which has damaged a building containing ACMs.

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[1] Smith, KR and Saunders PJ, *The Public Health Significance of Asbestos Exposures from Large Scale Fires* http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1204013002817; and Noel Arnold and Associates Pty Ltd, *Report on the Investigation of the Effect of Fire on Asbestos Fibre Contamination for the Victorian Department of Human Services.* November 2006

[2] Air monitoring conducted by Workplace Health and Safety Queensland (WHSQ)

# 4. Risk management during a fire involving a structure containing ACMs

During the fire, the site will be under the direction and control of the emergency services. Fire officers who are involved in controlling the fire should use their standard procedures for preventing exposure to smoke, and for decontamination following fire control. At times, police officers assist to control access to the fire area. Police officers, and others, should avoid the smoke plume or use P2 respirators.

During the actual fire, very low concentrations[3] of asbestos fibres, well below typical background levels, may be released in the fire plume. Avoiding the smoke plume is prudent. However, dilution of the plume by air drawn into the fire[4], and the use of water and foam to control the fire, will assist in limiting the concentration and spread of airborne fibres[5]. However, it is still advisable for occupants of properties downwind of the fire location to:

- close windows and doors, and
- follow the direction of emergency services officers. This includes, if required, temporarily evacuating the property until the fire is extinguished.

When exposed to fire and high temperatures, the ACM products may suddenly crack and break, causing the product to degrade as a result of loss of moisture from the high temperature. In these circumstances, the ACM products may 'explode' or spall into smaller pieces. Spalling of asbestos cement products can cause the release of fibres, but again these concentrations are well below typical background levels, and typically spalling only occurs in the early stages of the fire.[6,7] The most significant effect of spalling is the distribution of debris, often many meters from the original material and potentially beyond the boundary of the property or site.

[3] Bennetts, ID., Hunter, C., Fabiny, M., and Fazio, E, *A study on the effect of fire on asbestos cement roofing*. J Health Saf Environ, 2013, 29(3), p:175-189
[4] Bennetts, ID., Hunter, C., Fabiny, M., and Fazio, E, *A study on the effect of fire on asbestos cement roofing*. J Health Saf Environ, 2013, 29(3), p:175-189
[5] Smith, KR and Saunders PJ, *The Public Health Significance of Asbestos Exposures from Large Scale Fires* http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1204013002817
[6] Noel Arnold and Associates Pty Ltd, *Report on the Investigation of the Effect of Fire on Asbestos Fibre Contamination for the Victorian Department of Human Services.* November 2006
[7] Bennetts, ID., Hunter, C., Fabiny, M., and Fazio, E, *A study on the effect of fire on asbestos cement roofing*. J Health Saf Environ, 2013, 29(3), p:175-189

**Photo 1:** The high temperature of the fire has caused a spalling effect to the roof sheeting

# 5. Risk management after the fire

Following the fire, control of the site will usually return to the owner or manager of the site.

Analysis of dust and debris after fires involving asbestos cement sheet have been extinguished, including fire simulations, have found that although bundles of asbestos fibres are present within the debris and ash, there is little evidence of loose, respirable-sized asbestos fibres.[8,9]

After a fire has been extinguished, the debris may contain a variety of material including a mixture of both asbestos and non-asbestos materials. This material can include unaffected ACM sheeting, broken pieces of otherwise undamaged ACM, thin segments of ACM that has delaminated longitudinally, charred wood, and other burnt building fabrics and contents.

The preliminary assessment of the site will focus on the need to prevent disturbance of ACD and the damaged structure as far as possible, and the identification of safe work procedures. Where ACD is identified in an area, it is important that the area of contamination be determined, including an assessment of the amount and condition of the ACD present. This can be done by systematically walking over the area in a grid fashion, and recording:

- the approximate boundaries of the affected area
- the main impact locations
- the frequency and indicative size of fragments, and
- whether the material is in poor condition, for example, will crumble with minimal pressure.

[8] Bennetts, ID., Hunter, C., Fabiny, M., and Fazio, E, *A study on the effect of fire on asbestos cement roofing*. J Health Saf Environ, 2013, 29(3), p:175-189

[9] Noel Arnold and Associates Pty Ltd, *Report on the Investigation of the Effect of Fire on Asbestos Fibre Contamination for the Victorian Department of Human Services.* November 2006; and Smith, KR and Saunders PJ, *The Public Health Significance of Asbestos Exposures from Large Scale Fires* http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1204013002817

It is also important to estimate the likelihood of disturbance to the affected area by people and in particular, vehicles that may result in fragment damage and the release of asbestos fibres.

The risk assessment should include:

- the type of ACMs within the building, for example were only bonded materials such as fibro present, or were friable insulation or fire retardant products in the building
- the location of the ACD, the extent of damage to ACM, and the area over which the ACD is located
- the likelihood of disturbance of damaged ACM and ACD, for example, what the site is used for, the occupancy of the area, the likelihood/frequency with which activities are likely to take place on the site.

Unless the fire debris is significantly disturbed, the risk to the public and neighbours from exposure to airborne asbestos fibres above normal background levels is low.[10,11] Appendix 1 contains the results of air measurement for asbestos fibres following house fires. It can be seen from these results that the likelihood of asbestos fibres being blown off-site in measurable concentrations likely to cause exposure significant enough to cause asbestos-related disease is extremely low.

## 5.1 Council inspectors, police officers, forensic science officers and others who may have to carry out duties within the fire zone

The following should be included in a personal protective equipment (PPE) and decontamination procedure:

a) Marking a PPE zone around the debris inside which items (b) and (c) must be implemented.
b) Must wear gum boots, or boot covers, hooded disposable Type 5 coveralls, P2 respiratory protection and gloves, at all times while in the PPE zone. Must also be clean shaven to ensure a proper respirator fit to the face (unless wearing full face positive pressure respirators).
c) A decontamination procedure that includes decontamination of PPE prior to removal, and decontamination of all equipment prior to its removal from the PPE zone.
d) Disposable PPE discarded as asbestos waste, and non-disposable PPE wet wiped and placed into a container in readiness for the next site.

[10] EnHealth (2005) *Management of asbestos in the non-occupational environment*, www.health.gov.au/internet/main/publishing.nsf/Content/ohp-enhealth-asbestos-cnt.htm
[11] Bennetts, ID., Hunter, C., Fabiny, M., and Fazio, E, *A study on the effect of fire on asbestos cement roofing*. J Health Saf Environ, 2013, 29(3), p:175-189

## 5.2 Managing the primary and secondary debris zones

Investigation of fire damaged properties has found most debris is usually located within the immediate vicinity of the collapsed or damaged shell of the building.[12] This area is the **primary debris zone**. Some debris may also be found further from the damaged building with distances determined by the size of the building and intensity of the fire. Debris can be found on the building property and may also be on neighbouring properties and public land. This area is the **secondary debris zone**.

These zones should be carefully inspected for the presence of ACD. Affected areas should be clearly marked out. Photo 2 illustrates the primary and secondary debris zones.


**Photo 2:** This single story fibro clad house was extensively damaged by fire. Confirmed asbestos containing material, from the roof, soffits, external and internal walls was found both internal to the structure and in a radius of approximately 20 metres from the structure.

Regardless of the low risk, the presence of fire damaged ACM can cause anxiety to people living nearby to the damaged structure. Therefore, **optional encapsulation and wetting of the ACD and damaged ACM** within the primary and secondary debris zones can be performed as follows:

- encapsulated by low pressure spray canister or by an airless spraying equipment using products such as polyvinyl acetate (PVA) glue mixed with water to a consistency of 5 parts water to 1 part PVA, or
- kept moist with gentle spraying of water, or
- wetted down with water and then covered with tarps or similar and firmly secured.

Tarps and similar (such as sand) can be used to temporarily encapsulate ACD whilst awaiting removal.

### 5.2.1 Primary debris zone

**Prevent access.** Possible risk is associated with physical disturbance of the ACD, particularly any thin, delaminated pieces of ACM. There is also a risk of people being

[12] Smith, KR and Saunders PJ, *The Public Health Significance of Asbestos Exposures from Large Scale Fires* http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1204013002817

injured from collapse of the fire damaged building because it is no longer structurally sound. Measures to prevent people from entering the primary debris zone may include the following precautions:

- Putting up warning signs cautioning people from entering the boundaries of the property containing the fire damaged building. An existing fence around the boundary of the property may be used to affix the required signage and aid in preventing persons from entering the debris area.
- If signage is not sufficient to keep people out of the debris zone consideration should be given to erecting a fence, which can include temporary fencing.

Photos 3 and 4 illustrate the above.


**Photos 3 and 4**: Examples of barriers and signage that may be required if there is a need to prevent people from entering the fire damaged property

### 5.2.2 Secondary debris zone

ACD in the secondary debris zone, including neighbouring properties and/or public land, should be contained and disposed of, as soon as reasonably practicable, because of the likelihood of people disturbing the debris. Activities such as mowing grass should be avoided until ACM debris has been disposed of.

## 6. Removal of debris, and demolition of fire damaged structures

The first step for any affected site is the removal of all visible surface ACD. This can be achieved by hand picking and raking if practical to uncover near surface fragments.

Depending on the extent of fire damage, ACD will be present in varying quantities. Where the ACD is more than minor contamination[13], removal from a business

[13] Guidance on what constitutes minor asbestos contaminated dust and debris can be found in the 'Minor contamination' of asbestos-containing dust or debris fact sheet.

premises must be performed by a business holding a class A asbestos removal licence, issued under the *Work Health and Safety Regulation 2011.* Air monitoring will need to be performed by a person holding an Asbestos Assessor Licence (i.e. a Licensed Asbestos Assessor) issued under the *Work Health and Safety Regulation 2011.* The Licensed Asbestos Assessor must carry out the air monitoring during the removal of the ACD, and then at the completion of the removal, as part of the clearance inspection. The Licensed Asbestos Assessor must also carry out a visual clearance after the class A licensed asbestos removal work has been completed to verify that the area is safe for normal use, and provide a clearance certificate. Removal of major ACD from a domestic property should also be performed in a similar manner.

Where the ACD is 'minor contamination', removal of the ACD from a business premises by a licensed asbestos removalist or air monitoring is not mandated by the *Work Health and Safety Regulation 2011*. At both business and domestic premises, a competent person should remove the ACD in accordance with the *How to Safely Remove Asbestos Code of Practice 2011*, and the content of this Guidance Note.

If demolition of a fire damaged ACM structure is required, the person performing the demolition may require a demolition licence issued under the *Work Health and Safety Regulation 2011*. Business operators performing demolition are regulated under the *Work Health and Safety Regulation 2011*.

If, following or during the demolition of the building, greater than $10m^2$ of non-friable ACM is to be removed from a business premises, the business operator must also hold either an A or B class asbestos removal licence, issued under the *Work Health and Safety Regulation 2011.* Additional guidance is provided in the *How to Safely Remove Asbestos Code of Practice 2011.*

A homeowner who is removing greater than $10m^2$ of non-friable ACM from their domestic property must hold a relevant certificate issued by Queensland Health.

An asbestos removal control plan must be prepared by the licensed asbestos removalist and include at least the following measures:

- A description of the methods of demolition proposed to be used and type of major equipment proposed for implementing those methods.
- A description of the methods proposed for handling and disposing of demolished materials and, in particular, ACM.
- A description of the proposed sequence of carrying out the demolition works and an estimate of the time, in days, that it is likely to take to complete all or each of the stages of the work.
- Methods adopted to control the release of dust by using water to suppress the site residue and debris, for example, continuous mist water sprays covering the whole site.
- Securing the site and erecting warning signs.
- Provision of barricading and fencing to prevent unauthorised site access.
- Controls used to capture water runoff from the site.

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http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/minor-contamination-asbestos-factsheet

- Methods to decontaminate plant and equipment whilst on site. This includes the changing of the pre filters on the mobile plant air conditioning system, and engine air filter, prior to the relocation of this equipment to another site.
- Selection of appropriate PPE for workers.
- Conducting air monitoring on site.
- Allowance for weather conditions on site and monitor any changes like wind directions.
- Details of protective measures, including overhead protection and scaffolding required.
- Management of traffic in and out, and on-site.
- Informing the neighbouring properties of the activities prior to the commencement of the demolition.
- Details on waste storage and disposal.

Demolition work and licensed asbestos removal work must also be notified to Workplace Health and Safety Queensland before work starts. See the Asbestos notifications page (https://www.worksafe.qld.gov.au/injury-prevention-safety/asbestos/asbestos-demolition-notifications) for more information.

Diagram 1 illustrates the set-up of the site, including position of equipment such as dust suppression devices, for example, sprinklers, used to minimise the release of dust during demolition.

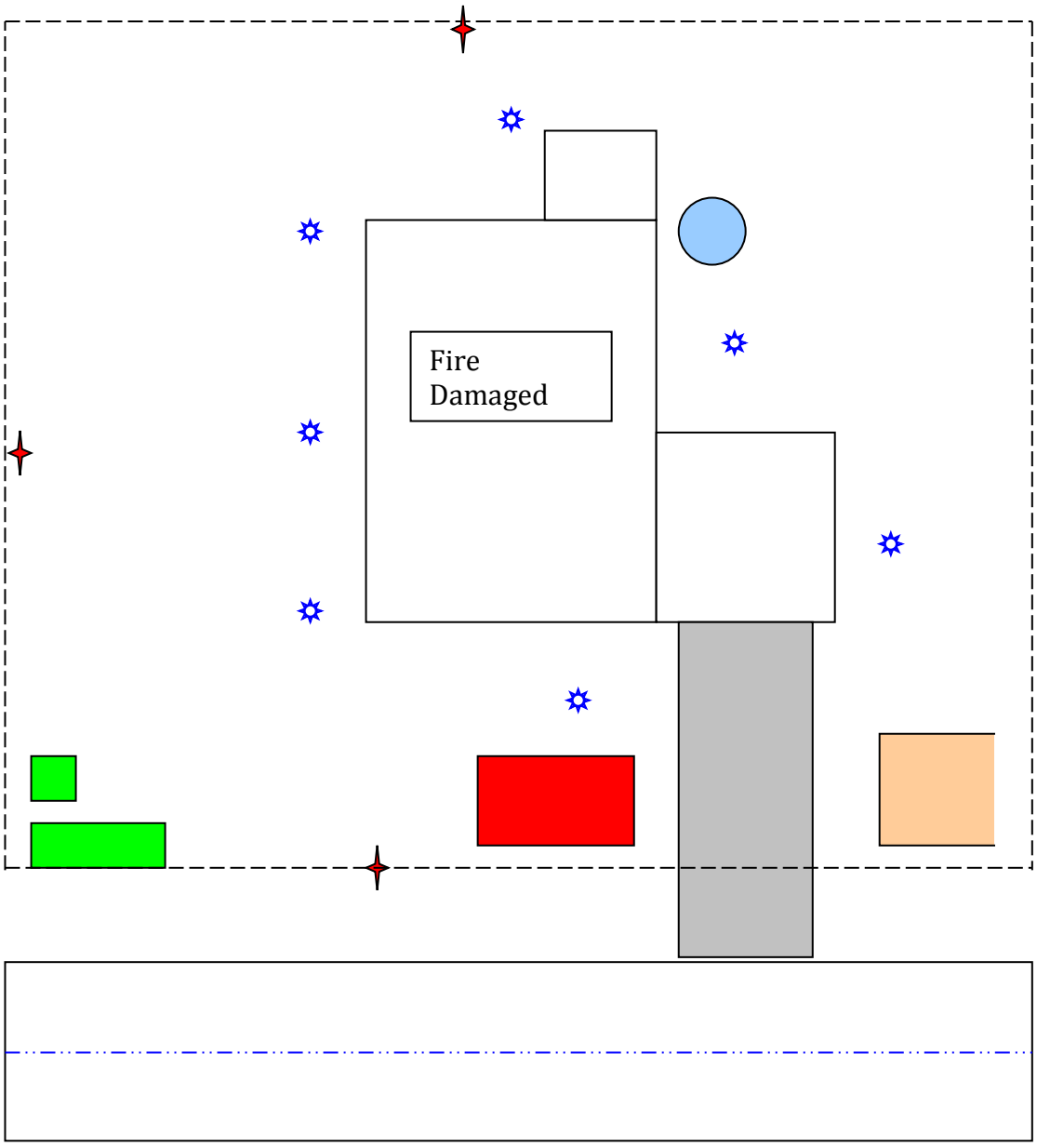


**Diagram 1:** Example of site set up for demolition of a building with ACM

Legend

Air monitoring positions……

Perimeter Fencing and signage……

Dust suppression devices (sprinklers)……..

Decontamination area of plant……..…

Toilet and staff amenities and decontamination Area…….

Waste management area……..

Traffic management controls in place……

Appendix 2 contains the results of air sampling conducted during actual demolition of a fire damaged building whilst a range of dust suppression techniques were in operation.

## Managing soil impacts[14]

It is important to note asbestos soil contamination from fire events is confined to soil surface impacts only. Therefore, there is no requirement to excavate the soil in the secondary debris zone. All visible ACM should be removed. Photos 5 and 6 illustrate typically visible debris on the ground in the secondary debris zone following a fire.

**Photos 5 and 6:** Residue showing typical visible soil surface debris

Soil scraping and excavation would only be required in the primary debris zone in the event the fire damaged structure required demolition, and then only under the immediate area of the fire damaged structure. In this case the depth of soil removed could be approximately 30-50mm, as the impact of fire debris is limited to the surface of the soil only. Surface soil containing asbestos material should be safely contained, wetted down, and wrapped in two layers of 200 micrometre (µm) polythene and disposed of as asbestos waste to an approved landfill.

If all visible ACM debris has been removed, sampling of the soil and analysis for asbestos is not required.

**Personal protective equipment (PPE) Persons** engaged in the containment and disposal of fire damaged ACM should use a range of PPE as outlined below.

- P2 disposable respirator or a half-face reusable respirator
- disposable coveralls suitable to the task, for example, European Standards Type 5 or Type 6, and
- boot covers, or gumboots, or shoes without laces.

The above are illustrated in photo 7.

[14] Queensland Department of Heritage and Environmental Protection, 2014.


**Photo 7:** PPE that should be worn during clean-up of debris

**For ACM debris on the lawn**– Put on a P2 respirator and coveralls. Wet the debris with light water pressure from a garden hose or spray bottle. Large pieces can be picked up and placed in a sturdy plastic bag or container[15]. Very small pieces and/or significantly damaged pieces can be shovelled up along with the soil immediately below, and placed into the bag or container. Photo 8 shows a picture of significantly fire damaged ACM that should be shovelled up along with the soil immediately below.

**Photo 8:** delaminated thin pieces of ACM should be shovelled up along with soil immediately below

**For debris on roofs** - Put on a P2 respirator and coveralls. Disconnect the downpipe from the stormwater line and tape a filter medium product, for example Bidim

[15] 200 micrometre thickness and labelled with the words “asbestos waste, do not open”. Waste bins and or skips can be supplied with a liner from waste removal companies.

Geofabric™ [16], or a filter sock filled with fine sand, over the open end of the down pipe to collect residue that may be dislodged during rain events. This also prepares the roofs and gutters to be washed down by a garden hose applied at low pressure. The collected residue from the roof will be contained in the filter medium and must be disposed of as asbestos waste once the work is completed. Photo 9 illustrates an example of a filter medium. Photo 10 illustrates debris on a neighbouring roof.

**Photo 9**: Filter medium

**Photo 10**: small pieces of fire debris on a neighbouring roof

**For visible debris on hard surfaces such as window and door sills**, **ledges** - Put on a P2 respirator and disposable coveralls in preparation for wet wiping visible dust and debris off hard surfaces. Wet wiping involves using a moistened cloth to wipe dust from a surface, as shown in photo 11. To ensure the surface of the wipe is used only once, the wipe is folded after each wipe so as to expose a clean wipe surface. When folding of the wipe cannot expose any further clean wipe surfaces, the wipe is disposed of as asbestos waste.

A wetted wipe

A wetted wipe being used on a surface once only

**Photo 11**: wet wiping of hard surfaces

Although Workplace Health and Safety Queensland (WHSQ) have not developed a specific video that illustrates the use of PPE, removal of debris from lawn areas, and

[16] Can be purchased from industrial product suppliers

wet wiping of surfaces specifically for fire damage to ACM, these concepts are illustrated in the following films - 1) Asbestos Safe Work Procedure Storm and Wind Damage Clean-up, and 2) decontamination procedures. These films can be found on the WHSQ website.

**For visible debris on plants and gardens**, put on a P2 respirator and coveralls, roll out some filter medium or plastic sheeting under the plants or trees, and then lightly wash down these plants with a garden hose at low pressure. If the debris is hard to dislodge from the plant foliage then use a wet rag or wet wipe, or alternatively cut off the foliage. Dispose of the filter medium, wipes and foliage as asbestos waste.

**If there is a need to wash down driveways, concrete paths etc**, put on a P2 respirator and coveralls, and using a post-hole shovel, dig an earthen channel to the shovel width and the full length of driveway and or path. Then lay some filter medium in the channel/s. Using water at low pressure from a garden hose, wash the debris into the channel so the debris collects in the filter medium. Once the surfaces are visibly clean, carefully roll up the filter medium and dispose of as asbestos waste. Replace the soil in the channel. This is illustrated in Diagram 2. Photo 12 illustrates debris on a paved pathway, and photo 13 illustrates the filter medium taped in place.

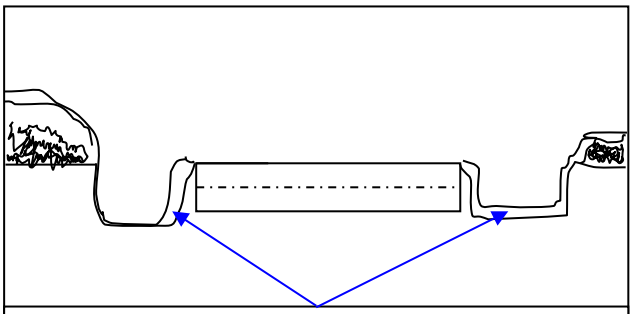

**Diagram 2:** showing the earth channel with the filter medium duct taped in place on either side of a path.

**Photo 12**: small piece of debris on paved pathway

**Photo 13:** Filter medium in a channel in place in readiness to capture residue and filter out the water.

## Bagging of debris

Before the debris is placed in the bags you must first ensure that it has been wetted down. Once the bag is one third full, twist the remainder of the bag to form a long section which is then ducted taped to secure the bag. Place this bag inside another bag. This is called double bagging. This is illustrated in photo 14. Alternatively, place the single bag in a polyethylene[17] lined bin or container and then seal the lid on completion. The waste is then taken to an approved waste disposal site.


**Photo 14:** ACM debris correctly sealed in an approved bag.

## Decontamination of people

Following completion of the containment and removal of the debris, or prior to taking a break during the process, the following decontamination steps are the minimum that should be followed.

[17] 200 micrometre thickness. Waste bins and or skips can be supplied with a liner from waste removal companies

Step 1: Standing on a plastic sheet (a decontamination facility), use an atomiser bottle of water to wet the coveralls.

Step 2: Wet wipe boots

Step 3: Remove the moistened coveralls

Step 4: Place the coveralls and wipes in an approved waste bag.

Step 5: Fold up the plastic sheet.

Step 6: Place the folded sheet in the waste bag.

Step 7: Tape the first bag shut

Step 8: Place the first bag inside a second bag. Now remove disposable respirator and place in the second bag.


Step 9: Seal the second bag


Step 10: All waste properly sealed in the approved bag.
Step 11: Wash hands thoroughly under running water.

# 7. Transport and disposal of ACM debris

You must hold an environmental authority for regulated waste transport and submit waste transport certificates[18] to transport ACM if:

- the load is 250 kg or more or
- the load is less than 250 kg and you are transporting it on a commercial basis.

Under the Environmental Protection Regulation 2008, regulated waste includes any waste that contains a constituent of a regulated waste. Therefore 250 kg of soil which is contaminated with asbestos is classed as 250 kg of ACM[19].

Application for an environmental authority to transport regulated waste is made to the Department of Environment and Heritage Protection (DEHP) - contact 13 QGOV. Alternatively, you can engage a commercial business whose business undertaking is the transport of asbestos waste. This business must also hold an environmental authority to transport regulated waste in a vehicle and waste transport certificates must be completed and submitted to EHP.

Contact your local Council for information about where you can dispose of asbestos waste.

# 8. The role of government health, safety, and environmental regulators and local council

Depending upon the location and circumstances of a fire damaged property, workplace health and safety, public health, and environmental legislation may apply.

To minimise public concern and confusion following fires involving asbestos containing materials, the relevant State government authorities (such as the Department of Health, Workplace Health and Safety Queensland, the Department of Environment and Heritage Protection) and local government authorities may coordinate a response to address public concern or health risk.

Workplace Health and Safety Queensland has responsibilities under the workplace health and safety legislation to manage events related to persons conducting a business or undertaking, and for business premises.

The Department of Environment and Heritage Protection (DEHP) has responsibilities under the *Environmental Protection Act 1994* to manage incidents where there is release of hazardous materials causing or having the potential to cause environmental harm.

When a building is dangerous, dilapidated or unfit for use of occupation, (perhaps because of fire) the relevant local government may take action under the *Building Act 1975*.

[18] Submit to Department of Environment and Heritage Protection (DEHP)
[19] Department of Environment and Heritage Protection 2014

Local government has responsibilities under the *Public Health Act 2005* to protect community against health risks from exposure to asbestos arising from the handling and removal of asbestos by home owners at domestic premises.

# 9. Who to contact

Ultimately, the owner of a fire damaged building is responsible for ensuring any public health and safety issues arising from their building or their property are managed. The local council and a number of state government departments may oversee the owner's actions to ensure that public health and safety is protected.

If there is a concern that the fire damaged building may not be structurally sound and could collapse, the local council should be contacted.

For fire-damaged domestic premises, if there is a concern that the homeowner is not taking precautions to stop asbestos getting into the air when containing and removing debris after the fire, the local council should be contacted in the first instance. The local council may seek assistance from the Department of Health on this issue.

If there is a concern that a business, contractor or tradesperson is not taking precautions to stop asbestos getting into the air when cleaning up after the fire, please contact Workplace Health and Safety Queensland on 13QGOV (13 74 68).

For significant building fires involving asbestos (e.g. large commercial or industrial buildings), a coordinated government response may be carried out to manage public health and safety issues.

## For further information

General information about asbestos can be found at asbestos.qld.gov.au.

## References

Bennetts, ID., Hunter, C., Fabiny, M., and Fazio, E, *A study on the effect of fire on asbestos cement roofing*. J Health Saf Environ, 2013, 29(3), p:175-189

EnHealth (2005) *Management of asbestos in the non-occupational environment*, www.health.gov.au/internet/main/publishing.nsf/Content/ohp-enhealth-asbestos-cnt.htm

Noel Arnold and Associates Pty Ltd, *Report on the Investigation of the Effect of Fire on Asbestos Fibre Contamination* for the Victorian Department of Human Services. November 2006

Smith, KR and Saunders PJ, *The Public Health Significance of Asbestos Exposures from Large Scale Fires*
www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1204013002817

## Appendix 1: Results of fibres in air monitoring conducted at fire damaged buildings [20]

| Pictures of the fire damaged houses at which airborne fibre measurements were conducted | Fibre in air monitoring conditions | Results of airborne fibre monitoring | Reference |
|---|---|---|---|
|  | (a) 5 x sampling filters connected to pumps were located within the damaged buildings, and at approximately five, ten and 20 metres away from the damaged buildings, on the four fence boundaries of the properties, and upwind and downwind. The day of sampling was sunny, with a light breeze blowing. The debris was dry. Fibre sampling and analysis was conducted in accordance with the *Guidance Note on the Membrane Filter Method for estimating Airborne Asbestos Fibres 2nd Edition [NOHSH 3003 (2005)]*.<br>Sampling was conducted for approximately four hours at a pump flow rate of 2.0 litres/minute. | Fibre concentrations were found to be < 0.01 fibres per millilitre of air, which is below the limit of detection of the measurement procedure. To put this into a risk content, the occupational exposure standard for asbestos fibres is 0.1 fibres per millilitre, and the lowest action level for reviewing risk management procedures under workplace health and safety legislation is 0.01 fibres per millilitre of air. Therefore the likelihood of asbestos fibres being blown off-site in measurable concentrations likely to cause exposure significant enough to cause asbestos related disease is extremely low. | Sampling conducted by WHSQ 2011 |

[20] Workplace Health and Safety Queensland 2012

| | | | |
|---|---|---|---|
|  | (b) 5 x sampling filters connected to pumps were located within the damaged buildings, and at approximately five, ten and 20 metres away from the damaged building, on the four fence boundaries of the properties, and upwind and downwind. The day of sampling was sunny, with a strong breeze blowing. The debris was dry. Fibre sampling and analysis was conducted in accordance with the Guidance Note on the *Membrane Filter Method for estimating Airborne Asbestos Fibres 2nd Edition [NOHSH 3003 (2005)]*.<br>Sampling was conducted for approximately four hours at a pump flow rate of 2.0 litres/minute. | Fibre concentrations were found to be < 0.01 fibres per millilitre of air, which is below the limit of detection of the measurement procedure. To put this into a risk content, the occupational exposure standard for asbestos fibres is 0.1 fibres per millilitre, and the lowest action level for reviewing risk management procedures under workplace health and safety legislation is 0.01 fibres per millilitre of air. Therefore the likelihood of asbestos fibres being blown off-site in measurable concentrations likely to cause exposure significant enough to cause asbestos related disease is extremely low. | Sampling conducted by WHSQ 2011 |

## Appendix 2: Results of fibre in air monitoring conducted during demolition of a fire damaged house [21]

| Pictures of approved fire damaged house demolition practices during which airborne fibre measurements were conducted | Fibre in air monitoring conditions | Results |
|---|---|---|
| | Sampling for airborne asbestos fibres was conducted over three days during demolition of a fire damaged house. 18 x sampling filters connected to pumps were located within the property, within neighbouring properties, and on the property boundaries. During the three days of sampling the weather was sunny, with a light breeze blowing. Methods to minimise dust generation were implemented and included the debris being kept damp during the demolition process and dust barriers erected along all boundaries of the property. Fibre sampling and | Fibre concentrations were found to be < 0.01 fibres per millilitre of air, which is below the limit of detection of the measurement procedure. To put this into a risk content, the occupational exposure standard for asbestos fibres is 0.1 fibres per millilitre, and the lowest action level for reviewing risk management procedures under workplace health and safety legislation is 0.01 fibres per millilitre of air. Therefore the likelihood of asbestos |

[21] Workplace Health and Safety Queensland (WHSQ), and independent air monitoring under the supervision of WHSQ 2012

Water spraying during machinery demolition

Dust barriers on boundaries of the demolition area

analysis was conducted in accordance with the *Guidance Note on the Membrane Filter Method for estimating Airborne Asbestos Fibres 2nd Edition [NOHSH 3003 (2005)]*.
Sampling was conducted for approximately four hours at a pump flow rate of 2.0 litres/minute.

fibres being blown off-site in measurable concentrations likely to cause exposure significant enough to cause asbestos related disease is extremely low.

Water mist spraying during machinery demolition