



PATTLE DELAMORE PARTNERS LTD

Hobsonville Point, Sunderland B and C Precincts – Remedial Action Plan

Hobsonville Land Company Limited



Hobsonville Point, Sunderland B and C Precincts – Remedial Action Plan

• Prepared for

Hobsonville Land Company Limited

• September 2015



PATTLE DELAMORE PARTNERS LTD
Level 4, PDP House
235 Broadway, Newmarket, Auckland 1023
PO Box 9528, Auckland 1149, New Zealand

Tel +64 9 523 6900 Fax +64 9 523 6901
Website <http://www.pdp.co.nz>
Auckland Tauranga Wellington Christchurch



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DOCUMENT CONTRIBUTORS

Prepared by

SIGNATURE



James Conway

Reviewed by

SIGNATURE



Nerena Rhodes

Approved by



Keith Delamore

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Executive Summary

Pattle Delamore Partners Limited has been engaged by Hobsonville Land Company Limited to prepare a Remedial Action Plan for soil contamination at the Hobsonville Point, Sunderland B and C development site.

This RAP document provides a detailed methodology and specification for The Contractor, for the remediation of lead, arsenic, asbestos and benzo(a)pyrene impacted soils. It includes a discussion of the remediation objectives and rationale, detailed work specification and methodology, remediation plans and health and safety and environmental protection measures.

The RAP has been prepared in accordance with the Ministry for the Environment Contaminated Land Management Guidelines (No.1) (MfE, 2011a) and the ACRP:ALW Schedule 13.

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1.0 Introduction

Pattle Delamore Partners Limited (PDP) has been engaged by Hobsonville Land Company Limited (HLC) to prepare a Remedial Action Plan (RAP) for soil contamination at the Hobsonville Point, Sunderland B and C development site (the site). The proposed development consists of Block 8, Block 9 and Block 10 and is located in the north of Hobsonville Point, along Buckley Avenue, Marine Parade and Hudson Bay Road (Figure 1).

This RAP details requirements for the remediation of contaminated soil identified in the Preliminary Site Investigation (PDP, 2015) and the asbestos register prepared by Thomas Civil and Engineering Consultants (TCEC).

2.0 Summary of Soil Sampling and Previous Investigations

Previous investigations involving soil sampling and laboratory testing undertaken across the site (summarised in PDP, 2015) have shown elevated levels of benzo(a)pyrene equivalence (BaP eq.)¹ in two ‘hotspot’ areas, elevated lead and/or arsenic concentrations in nine ‘hotspot’ areas and the presence of asbestos containing material (ACM) in soil at Blocks 8 and 10. Sampling has also shown elevated levels of lead in soil around the perimeter of buildings as a result of the flaking of lead paint, the ‘lead paint flake zone’.

Previous investigations across the wider Hobsonville Point have shown ACM is used as cladding on some buildings, is present in construction fill and is used in pipework associated with underground services.

3.0 Scope and Purpose

The principle purpose of the remedial works is to mitigate the potential exposure risk from lead, arsenic, BaP eq. and ACM in soil within the site area for people using the site for future residential purposes.

The purpose of the RAP document is to provide a detailed methodology and specification for The Contractor, for the remediation works to be undertaken. It includes a discussion of the remediation objectives and rationale, detailed work specification and methodology, remediation plans and health and safety and environmental protection measures.

The RAP has been prepared in accordance with the Ministry for the Environment (MfE) Contaminated Land Management Guidelines (No.1) (MfE, 2011a) and the

¹ BaP equivalent measures the relative toxicity of nine carcinogenic polycyclic aromatic hydrocarbon (PAH) compounds, relative to benzo-a-pyrene. A toxicity equivalence factor (TEF) is ascribed to each of the nine compounds, relative to benzo-a-pyrene which has a TEF of 1. When these TEFs are added together, the toxicity of the mixture of PAHs, and their risk to human health, may be assessed.

ACRP:ALW Schedule 13, which sets out the information to be included in a site RAP.

This RAP will be used as a supporting document to accompany resource consent applications for the remediation of contaminated land.

3.1 Regulatory Consent Requirements

Past land use activities conducted at the former Air Force Base are listed on the MfE Hazardous Activities and Industries List (2011), and therefore the site area is subject to the Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health (MfE, 2012)) (NES). Due to the detections of BaP eq., lead and arsenic concentrations above the health criteria, the presence of ACM in some of the soil samples and the volume of soil to be disturbed during proposed remediation site works, consent is required with respect to the NES.

In addition, due to the elevated BaP eq., lead and arsenic concentrations in the soil, under the Auckland Council Regional Plan: Air, Land and Water (ACRP: ALW) (AC, 2013a), and the Proposed Auckland Unitary Plan (AC 2013b) a consent is required for the remediation of contaminated soil.

Regulatory requirements with regard to the use, handling, removal and disposal of asbestos containing materials (ACM), including asbestos in soil, are contained within the Health and Safety in Employment (Asbestos) Regulations 1998.

The New Zealand Demolition and Asbestos Association (NZDAA) has published an associated guideline: *New Zealand Guidelines for the Management and Removal of Asbestos (revised March 2011 edition)*. These Guidelines set out the minimum best practice procedures that should be followed in asbestos work, including the remediation of asbestos contaminated soil. Remediation of asbestos contaminated soil is considered to be restricted work under the Asbestos Regulations (1998) and, as such, must be undertaken or supervised by a person holding a current Certificate of Compliance for this type of work.

4.0 Overview of Remedial Strategy

4.1 Remediation Rationale

As discussed in Section 2, previous investigations and PDP's wider site knowledge have shown that contamination due to lead, arsenic and ACM is present in surface and shallow soils across the site associated with building materials and underground asbestos pipework. In addition BaP eq., lead and ACM have been identified in hotspots in some areas of the site. Therefore HLC has decided that, during development of the site, the shallow soil across the majority of the site, including the soil associated with the identified hotspots, will be removed and disposed of to an appropriate landfill.

4.2 Remediation Criteria

For lead, arsenic and BaP the “remediation criteria” is the lesser of:

- ∴ Human Health Criteria, (National Environmental Standard for Assessing and Managing Soil for Human Health – Soil Contaminant Protection Standards for the Protection of Human Health – Residential 10% produce (10 mg/kg for BaP eq; 210 mg/kg for lead; 20 mg/kg for arsenic) (MfE, 2011b)); and
- ∴ Soil Discharge Criteria (Auckland Council Regulatory Requirements (Auckland Council Regional Plan: Air, Land, Water (ARP: ALW (AC, 2013a)) and the Proposed Auckland Unitary Plan (2.15 mg/kg for BaP eq; 250 mg/kg for lead; 100 mg/kg for arsenic) (PAUP (AC, 2013b)).

There are no current New Zealand guidelines for ‘safe’ concentrations of asbestos in soil for residential land use. As a result, the remediation criteria adopted by HLC for asbestos in soil at Sunderland B and C is; no detectable asbestos.

There are no reserves or playgrounds proposed within Blocks 8, 9 or 10 of Sunderland B and C, and therefore residential (10 % produce) criteria were considered appropriate for the entire site.

4.3 Remediation Objectives and Strategy

The key objective of the remedial strategy is to remove all shallow soils in the site area, particularly those that contain asbestos and/or have reported soil concentrations of lead, arsenic and BaP eq. that exceed the nominated remediation criteria.

The proposed lateral and vertical extent of the remedial works are based on the results of the PSI (PDP, 2015), the extent of weatherboard buildings and on the results of the asbestos register compiled by TCEC (see Figure 1).

All soil removed will be disposed of to a landfill. Following validation sampling by the Environmental Consultant, the cut surface of the excavated areas can be mulched over to prevent soil erosion, pending further development.

Rather than remediate the whole site all at once, the remediation works will be carried out in stages across the site, roughly corresponding to the block numbers 8, 9 and 10. Each block (or section of a block) will be remediated and validated independently of the other blocks.

Refer to Section 5.0 for further detail on proposed remedial works.

4.4 Outline of Works

An outline of the key physical works required at each block to implement the remedial strategy is summarised in the following steps (in the order given).

1. Removal/demolition of the buildings on site, undertaken prior to commencing the remediation works;
2. Contractor completion of Health and Safety requirements and protocols for subsurface excavation activities;
3. Notification to Work Safe NZ for asbestos removal;
4. Contractor mobilisation and implementation of Health and Safety and environmental protection measures onsite (i.e. silt fences);
5. Site inspection by PDP and the Contractor, and remedial area mark out for hotspot areas identified in the PSI;
6. Asbestos soil scrape in the vicinity of removed/demolished buildings and services and disposal of contaminated soils to the selected landfill facility;
7. Excavation and disposal of contaminated soils from open areas to the selected landfill facility;
8. Collection of transport manifests and disposal receipts (including dates and volumes) from the landfill;
9. Soil validation sampling from base and lateral extents of excavations (undertaken by The Environmental Consultant);
10. Mulching of cut surfaces to prevent soil erosion;
11. Final site reinstatement, clean up and disestablishment;
12. Mobilisation to the next block.

5.0 Detailed Remediation Specification

5.1 Scope of Remediation Works

Figure 1 shows the predicted extent of the areas to be remediated superimposed on a site plan with the relevant former soil sampling investigation locations.

Following the demolition and/or removal of buildings on site, visible and underground ACM (associated with structures) will be removed by conducting a 0.15 m soil scrape across the contaminated areas (with the exception of the areas identified in blue as preliminary investigation areas on Figure 1). The remediation area is approximately 9.05 ha.

Prior to the works commencing, the Environmental Consultant will also mark out on site areas that require remediation that are not identified in the asbestos register and subject to preliminary sampling (identified in blue on Figure 1). These remedial areas include:

Block 8

- ∴ Area around samples SS20.9, SS20.11, SS20.13 and HA20.1/1, ACM present in soil. Exact remediation area will be delineated prior to commencement of works by collecting additional samples in a 10 m radius around the asbestos containing sample. Soil disposal to landfill.

Block 10

- ∴ Area around samples SS21.7, SS21.17 and SS21.20, ACM or lead contamination in soil. Exact remediation area will be delineated prior to commencement of works by collecting additional samples in a 10 m radius around the asbestos containing sample. Soil disposal to landfill;
- ∴ Lead contamination associated with sample SS21.28. Remediation area approximately 55 m², volume approximately 11 m³ (delineated by the extent of the garden the sample was collected in). Soil disposal to landfill.

Following excavation of the remediation areas, and once validation sampling has been conducted, the excavations will be stabilised with mulch.

5.2 Permits/Consents

The works are to be undertaken in accordance with the Auckland Council resource consents, and the Contractor shall ensure that all activities are undertaken in accordance with the conditions of the resource consents at all times. The Contractor shall be responsible for obtaining any additional consents/permits as required to undertake the works. All work to remove asbestos will be under the supervision of a person holding a Certificate of Competence for restricted work (the COC) following the procedures outlined in this RAP and in the *Guidelines for the Management and Removal of Asbestos Contaminated Material for Hobsonville Land Company* (TCEC, 2014).

5.3 Offsite Disposal Facility

All excavated material shall be disposed of to a 'licensed landfill' (e.g. Redvale Landfill) consented to accept soil impacted with asbestos, lead, arsenic and BaP residues at the concentrations detected and reported in the appended laboratory reports (Appendix A). The Contractor shall organise the landfill disposal permit for the material. A manifest system will be used to document the removal of the soil from the site and disposal location. The Landfill Manifest Form is attached in Appendix B.

5.4 Site Supervision

The proposed asbestos removal works at the site must be placed under the control of a single responsible person, i.e. a Site Supervisor, who shall ensure that the requirements within this RAP, and all consent conditions, are adhered to. The Site Supervisor shall be a person holding a certificate of competence issued by Work Safe NZ.

The work-scope for excavation and removal of the asbestos contaminated soil involves a risk management approach. Registered contractors will be required to remove the asbestos impacted soil and dispose of under permit to an approved landfill such as the Redvale Landfill in compliance with the Asbestos Regulations (1998) and other relevant guidelines.

During the excavation work, The Environmental Consultant will be onsite as required to undertake the following:

- ∴ Provide assistance, as necessary, to the Contractor on the works;
- ∴ Benchmark soils remaining on site.

5.5 Site Establishment

The Contractor shall mobilise to site with appropriate plant and equipment necessary to undertake the works in a safe and efficient manner. This shall include a site wash station for staff, and any necessary environmental protection measures.

Copies of all health and safety protocols for subsurface excavation work shall be completed and forwarded to the Environmental Consultant prior to commencement of works.

Prior to earthworks beginning, effective sediment and erosion control measures (i.e. silt fences) are to be installed as detailed in Section 7.6 and the site specific sediment and erosion control plan/s.

The Contractor shall be responsible for locating all underground services on the site, and shall take appropriate measures to identify, isolate and protect these services (where applicable).

The Contractor shall ensure the sites are secure to exclude the public at all times (including prevention of access by children). Any temporary site access points need to be managed to restrict access to the site at all times for the duration of the works.

The Contractor shall position a portable site toilet and wash facilities within an appropriate area on the site as approved by the Environmental Consultant.

5.6 Sequence and Timing of Remediation Works

HLC has engaged TCEC to identify visible and underground ACM on site (associated with structures) and oversee the removal of ACM contaminated soil by contractors in accordance with applicable legislation. TCEC have advised that, in line with the '*Guideline for the Management and Removal of Asbestos Contaminated Material*' report prepared by TCEC for HLC in 2014, the identification and removal of visible ACM will involve the following tasks.

For buildings:

- ✦ undertaking a survey of site buildings and structures;
- ✦ compiling a full asbestos register of all identified ACM which details the location, condition, quantity, type and whether it is friable or non-friable;
- ✦ removing all visible ACM from buildings and structures such as fences prior to demolition;
- ✦ conducting removal of ACM in isolated blocks of 6 – 10 units (cross contamination is intended to be contained by restricting access to completed areas);
- ✦ demolishing all houses to floor level and removing all rubble in the contaminated zones; and
- ✦ removing floors and inspecting sites for visible ACM (to be logged and removed following identification).

The identification and removal of underground ACM will involve:

- ✦ locating and excavating lateral soil from water main, stormwater and sewer lines to remove ACM and contaminated backfill;
- ✦ identifying cables in road crossings and checking for ACM conduits;
- ✦ tracing and scraping fence lines;
- ✦ removing concrete stairs, footpaths, slabs and piles and sending to a crusher if clear of ACM;
- ✦ scraping scoria rocks to check for buried ACM stockpiles; and
- ✦ inspecting property boundaries for sites where ACM may have been buried ('dump sites').

In all instances where ACM is identified in the ground, work is to stop, the location and extent of ACM contamination is to be logged, and then ACM is to be removed such that no visible remnants remain.

The removal of contaminated soil will involve:

- ∴ 150 mm scraping of sites where buildings have been demolished or removed to remove potentially contaminated soils;
- ∴ inspection of property boundaries for 'dump sites' and fence line contamination;
- ∴ scraping scoria hardfill from beneath footpaths and concrete slabs to check excavated ground surface for buried ACM stockpiles.

In effect, the surface of all unpaved areas within Blocks 8, 9 and 10 will be excavated to an initial depth of 150 mm bgl pending validation sampling (see Section 5.7), with the exception of the areas shaded blue on Figure 1 and discussed in Section 5.1.

The Contractor shall be responsible for continual monitoring of the soils excavated from the remedial areas. Each truck load of soil removed from the site must have a completed soil movement manifest form (Appendix B).

The material is to be excavated and removed from site by trucking.

Regarding the excavation of surface materials, the Contractor shall:

- ∴ Coordinate excavation of the 'contaminated' materials with the Environmental Consultant such that the 'contaminated' materials are identified and certified for removal by the Environmental Consultant;
- ∴ Not stockpile any excavated contaminated soil on areas previously scraped and validated as 'clean' within the site area;
- ∴ Load the 'contaminated' materials directly from the excavation into trucks without stockpiling on or off site;
- ∴ Be responsible for continual monitoring of the quantities of all excavated materials for offsite disposal;
- ∴ Ensure no excavated materials shall be reused as fill materials in the pits or elsewhere onsite.
- ∴ Maintain landfill weighbridge receipts for each and every truckload disposed of at the facility and notify and provide copies of these receipts to The Consultant at the close of the remediation project.

The Contractor shall undertake the excavation works in accordance with all special site management practices detailed in Section 6.0 below, the *Guidelines for the Management and Removal of Asbestos Contaminated Material for Hobsonville Land Company* (TCEC, 2014) and any Resource Consent conditions.

5.7 Validation Sampling by the Environmental Consultant

During the remediation works, validation sampling and testing of the remaining in-situ materials shall be undertaken by the Environmental Consultant.

The Contractor shall be responsible for co-ordinating with the Environmental Consultant regarding validation sampling and shall make the site available as requested.

Validation sampling shall be undertaken in accordance with the principles outlined in the MfE Contaminated Land Management guideline No. 5 (MfE, 2011b).

After the soil to be remediated has been removed, the Environmental Consultant shall inspect the excavation and soil validation samples will be collected for analysis by an IANZ accredited laboratory to confirm that the remaining soil does not contain asbestos and that chemical contaminant concentrations (including beneath the 'hotspot' areas) comply with the soil acceptance criteria.

A Site Validation Report (SVR) shall be prepared in accordance with the requirements of Auckland Council requirements (Schedule 13 ARCP:ALW) and with MfE Contaminated Land Management Guidelines Number 1 (MfE, 2011a). The SVR will be prepared to confirm that the objectives of the RAP have been met. SVRs may be prepared for each individual block (or part of a block) to facilitate staged development of the blocks.

5.8 Remediation Area Reinstatement

Once the remediation excavation is complete, the cut surface should be stabilised and mulched to prevent soil erosion from the excavation site. It is proposed that the erosion and sediment controls, such as silt fences, remain installed until development of the site is completed.

5.9 Final Site Clean Up and Disestablishment

Following reinstatement, the Contractor shall 'make good' the surface of any area (outside of the remediation areas) damaged or disturbed by the Contractor during the course of the works. The Contractor shall be responsible for minimising the area of activities (i.e. traffic and machinery access) within the site boundary to minimise disturbance to site.

Following completion of the works, any rubbish remaining on the site will be removed so that the site is left in a tidy condition. The Contractor shall remove all plant and facilities from the site.

6.0 Site Management Strategies

6.1 Supervision

All work to remove ACM will be under the supervision of a person holding a Certificate of Competence for restricted work (the COC). The COC must remain on the site at all times and shall be responsible for control of the ACM remediation works, and ensuring that the measures and objectives set out in this RAP and in the *Guidelines for the Management and Removal of Asbestos Contaminated Material for Hobsonville Land Company* (TCEC, 2014), are adhered to. The COC shall report to the Environmental Consultant who will undertake regular site visits during the works at key stages of the project.

If a different contractor is to undertake the remediation where ACM has not been identified, the Contractor shall be responsible for control of the remediation works, and ensuring that the measures and objectives set out in this RAP are adhered to. The Contractor shall nominate a Site Supervisor to be the Contractor's representative and be responsible for the site and contract works. The Site Supervisor shall report to the Environmental Consultant who will undertake regular site visits during the works at key stages of the project.

7.0 Health and Safety and Environmental Protection

The Contractor shall undertake the works in accordance with the Health and Safety in Employment Act 1992 (and amendments), and the RMA (and amendments).

Work procedures and safety measures to be adopted for the excavation of ACM contaminated soil are summarised in Section 7.26 of the NZDAA Guidelines (NZDAA, 2011). These measures, along with the further measures below, should be followed and integrated with standard health and safety procedures. These procedures are to be implemented at all times until the ACM contaminated soil has been removed, the excavation cavities stabilised and site validation has been completed.

The main potential hazards associated with excavating contaminated soils at the site are personal physical injury, inhalation of asbestos fibres and the release of contaminants into the environment.

7.1 Personnel and Access

- i. A registered asbestos removal contractor shall be employed to carry out the transport and disposal of all ACM from the site;
- ii. All contaminated soil will be disposed at an approved registered landfill facility under manifest documentation. The Contractor shall be responsible for returning completed manifest forms and landfill

acceptance dockets to the Environmental Consultant at the completion of the works;

- iii. Appropriate signage shall be erected, 'ASBESTOS HAZARD AREA – KEEP OUT' and placed so that they are clearly visible at all entrances to the work areas;
- iv. All personnel must sign in prior to entry onto the site, with no unregistered personnel allowed onsite;
- v. Outside normal working hours, access to the site is to be blocked by temporary fencing or other suitable barriers.

7.2 Personal Protective Equipment (PPE)

Protective safety equipment must be available and used by those workers involved in the excavation and handling of the soils impacted by asbestos to minimise exposure. Personal protection equipment (PPE) shall include but not be limited to the following:

- ✧ Safety boots;
- ✧ Tyvek disposable overalls;
- ✧ Protective gloves for any personnel handling potentially affected soils;
- ✧ Safety glasses; and
- ✧ Appropriate asbestos dust masks (P2 grade minimum).

At the conclusion of each working day, the Tyvek disposable overalls and masks are to be placed in a plastic bag (200 µm thick) and sealed. These bags shall be labelled in accordance with the Asbestos Regulations 1998 and disposed of together with the ACM by the registered contractor, and shall be treated as asbestos contaminated waste.

The Contractor shall ensure that all personnel working with or coming into contact with chemical contaminated soil are wearing standard PPE. The PPE shall include, but not be limited to the following:

- ✧ Sturdy waterproof, steel cap footwear (not exposed steel cap);
- ✧ High-visibility clothing;
- ✧ Nitrile gloves;
- ✧ Safety glasses;
- ✧ Cotton overalls;
- ✧ Hard hats.

The soil to be excavated and removed is not expected to be hazardous to workers and/or other receptors in the site vicinity. Should the encountered soils exhibit excessive odour and/or other visual properties that might indicate conditions are not as expected, the Site Supervisor shall immediately stop work at the site and notify the Environmental Consultant.

7.3 Personal Hygiene

Site personnel involved in the excavation and handling of contaminated soil will be made aware of the importance of personal hygiene. Inhalation of ACM must be avoided during the excavation works. The following measures will be implemented during the excavation of contaminated soil at the site:

- ∴ The designation of separate areas for eating, located away from the excavations, will be clearly delineated;
- ∴ No eating, drinking or smoking will be allowed within the immediate vicinity of the excavation and outside of the designated eating areas;
- ∴ Personal protection equipment must be removed prior to entering the designated eating area; and
- ∴ Hands and other exposed parts of the body are to be washed prior to entering the designated eating area and on leaving the site following excavation works.

7.4 Plant

All plant working within the contamination excavation areas shall remain within these areas throughout the duration of the works. Any plant being removed offsite (that has been in contact with the contaminated soils) shall be washed clean prior to removal. The Contractor shall ensure that any wash-down water is diverted back into the excavation pits, to ensure that no potentially contaminated water or water containing contaminated sediments leaves the site.

7.5 Site Traffic

The remediation areas will be accessed off Hudson Bay Road as shown on Figure 1. The Contractor shall be responsible for obtaining any necessary traffic permits from the local roading utility providers and/or local authority. The trucks shall be kept to paved or stabilised surfaces to avoid 'tracking' contaminated soil around the site.

All trucks used to carry impacted soils will have grain locks with water-tight tail gates, in order to ensure that no water is able to leak from the trucks during transportation of the material to the landfills. In addition, the loads shall be wetted down prior to transportation and covered during transportation.

The Contractor shall ensure that truck drivers are suitably qualified and competent to transport ‘contaminated materials’. Each truck load will be transported to the landfill under manifest documentation with relevant sections to be completed by the truck driver and landfill operator (a copy of the manifest form is appended in Appendix B).

7.6 Stormwater and Sediment Control Measures

The Contractor shall be responsible for implementing measures to control site storm water runoff so that no silt/sediment laden runoff is able to leave the remediation areas. The remediation areas are to be excavated to a depth as per the instructions of the Environmental Consultant. Any rainwater collecting in the pits once excavations are complete will be allowed to soak directly into ground. Sediment control/runoff measures shall be designed and implemented in accordance with Auckland Regional Council Technical Publication 90: Erosion and Control: Guidelines for Land Disturbing Activities in the Auckland Region 1999 (TP90) and the site specific sediment and erosion control plan/s.

The Contractor shall load ‘contaminated’ materials directly from the pits into waiting trucks so that no silty or chemical or ACM impacted stormwater generated during the remediation works is able to drain away from the site.

Given the shallow excavation depth, no continuous dewatering will be necessary for the excavation works.

7.7 Dust Control Procedures and Monitoring

7.7.1 Dust Control Procedures

During the ACM removal works, there is potential for generation of airborne dust which may contain asbestos fibres. The control and mitigation of dust at all stages during the works is critical in terms of preventing the potential health risks to site workers involved in the works, other workers in the greater site area and site neighbours. To prevent dust generation during the works the Contractor shall implement the following:

- ✧ Apply protective covers over excavated surfaces when left overnight.
- ✧ Dampen down work areas using a variable spray nozzle capable of producing a fine spray, i.e. not heavy drops that may raise dust when first striking dry earth, by permanently engaged personnel.
- ✧ Wetting of the loaded material once placed onto the trucks and covering loaded trucks prior to transporting.
- ✧ Keeping trucks to nominated site access tracks/routes to avoid dust generation from tracking.

Water spray rates shall be managed by the Contractor to keep surface conditions adequately damp while avoiding any ‘runoff’ of contaminants and/or silt offsite.

Dust control measures shall comply with the Ministry for the Environment, Auckland Council and ARC Technical Publication 152 (TP 152) guidance documents.

7.7.2 Air Quality Monitoring

Air quality monitoring to measure airborne asbestos fibre concentrations during the remedial works will be undertaken in accordance with the *Guidelines for the Management and Removal of Asbestos Contaminated Material for Hobsonville Land Company* (TCEC, 2014).

7.8 Hours of Work

The remediation works shall be restricted to the following work hours:

- | | |
|--------------------------------|--------------|
| ∴ Monday to Friday: | 7:00 – 18:00 |
| ∴ Saturday: | 8:00 – 18:00 |
| ∴ Sundays and Public holidays: | No work |

7.9 Excavation Records

The Site Supervisor shall ensure that records are kept of all excavation and filling works at the site. The Site Supervisor shall prepare a detailed final site plan showing final extent and dimensions of the excavation areas. The final site plan will be included in the validation report as detailed below. ***The Site Supervisor shall notify the Environmental Consultant and allow for inspection of the final excavations prior to any backfilling.***

8.0 Contingency Measures

If unexpected materials are identified during the remediation earthworks, which differ from the nature of the site contamination already identified in the previous PDP reports (e.g. odorous or unusually coloured soils or refuse, suspected ACM), the Contractor shall immediately notify the Environmental Consultant and stop work in the potentially contaminated area. The Environmental Consultant will inspect the potentially contaminated material and provide advice as to any additional sampling or any specific management actions which may be required. In the event that the scale or nature of an unexpected contamination issue encountered onsite differs significantly from the existing site information, then Council will be informed and the suitability of the controls and procedures in this RAP will be assessed. Further controls may be necessary to ensure that health, safety and environmental issues are managed appropriately.

9.0 Site Validation

Following completion of the remedial works, a Site Validation Report (SVR) shall be prepared by the Environmental Consultant to confirm that the works have been completed in accordance with this RAP. Due to the staged nature of the remediation, more than one SVR may be prepared. The SVR shall include:

- ∴ Records of observation of the removal works by the Environmental Consultant, including photographic records.
- ∴ Soil movement manifest forms and/or landfill dockets showing proof of contaminated soil disposal.
- ∴ Declaration by the Environmental Consultant that the works have been completed in accordance with this Plan.
- ∴ Site plan showing final extent and dimensions of the excavated areas.
- ∴ Details of site validation inspections and testing.

10.0 References

- AC, 2012. *Auckland Council Regional Plan: Air, Land and Water*. Auckland Council.
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- ARC, 1999. *Auckland Regional Council Technical Publication No. 90, Erosion and Sediment Control: Guidelines for Land Disturbing Activities in the Auckland Region*. Auckland Regional Council. Revised December 2007.
- ARC, 2002. *TP152: Assessing Discharges of Contaminants into Air*. Auckland Regional Council.
- MfE, 2011a. *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand*. Ministry for the Environment.
- MfE, 2011b. *Contaminated Land Management Guidelines No. 5: Investigation and Analysis of Soils*. Ministry for the Environment.
- NZDAA, 2011. *Guidelines for the Management and Removal of Asbestos*. New Zealand Demolition and Asbestos Association.
- PDP, 2015. *Hobsonville Point, Sunderland B and C – Preliminary Site Investigation Report (Draft Version)*. Pattle Delamore Partners Ltd.
- TCEC, 2014. *Guidelines for the Management and Removal of Asbestos Contaminated Material for Hobsonville Land Company*. Thomas Civil and Environmental Consultants Ltd.



SITE LOCATION

KEY

- **SS21.7** SAMPLE CONTAINS ASBESTOS FIBRES
- **SS21.28** ANALYTICAL RESULT EXCEEDS NES RESIDENTIAL CRITERIA AND/OR AC PERMITTED ACTIVITY CRITERIA FOR LEAD
- INDICATIVE REMEDIATION AREA
- PRELIMINARY SAMPLING AREA
- SUNDERLAND B AND C DEVELOPMENT BLOCKS ²

NOTES:

1. AERIAL IMAGERY (FLOWN FEB/MAR 2012) PROVIDED UNDER LICENCE FROM AUCKLAND COUNCIL WHO MAKES NO CLAIMS AS TO ITS RELIABILITY, ACCURACY OR ADEQUACY FOR ANY PARTICULAR PURPOSE
2. DEVELOPMENT BLOCKS: IGL_Marine Village Base_Master.dwg, SUPPLIED BY ISTHMUS GROUP LTD., RECEIVED 19/01/2015.

0 20 40 60 80 100m

SCALE 1:2,000 (A3)

FIGURE 1 : REMEDIATION PLAN

Appendix A
Laboratory Reports



ANALYSIS REPORT

Client:	Pattle Delamore Partners Limited	Lab No:	1457561	SPV1
Contact:	J Conway C/- Pattle Delamore Partners Limited PO Box 9528 Newmarket AUCKLAND 1149	Date Registered:	01-Aug-2015	
		Date Reported:	11-Aug-2015	
		Quote No:		
		Order No:		
		Client Reference:	A01964152	
		Submitted By:	Scott Nicol	

Sample Type: Soil						
Sample Name:		HA20.1/1	HA20.1/2	HA20.1/3		
		29-Jul-2015	29-Jul-2015	29-Jul-2015		
Lab Number:		1457561.1	1457561.2	1457561.3		
Individual Tests						
Dry Matter	g/100g as rcvd	70	78	76	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	-	-
Acenaphthylene	mg/kg dry wt	0.04	< 0.03	< 0.03	-	-
Anthracene	mg/kg dry wt	0.10	< 0.03	< 0.03	-	-
Benzo[a]anthracene	mg/kg dry wt	0.37	< 0.03	< 0.03	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.42	< 0.03	< 0.03	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	0.52	< 0.03	< 0.03	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	0.35	< 0.03	< 0.03	-	-
Benzo[k]fluoranthene	mg/kg dry wt	0.20	< 0.03	< 0.03	-	-
Chrysene	mg/kg dry wt	0.39	< 0.03	< 0.03	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	0.08	< 0.03	< 0.03	-	-
Fluoranthene	mg/kg dry wt	0.92	< 0.03	< 0.03	-	-
Fluorene	mg/kg dry wt	< 0.04	< 0.03	< 0.03	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.33	< 0.03	< 0.03	-	-
Naphthalene	mg/kg dry wt	< 0.16	< 0.14	< 0.14	-	-
Phenanthrene	mg/kg dry wt	0.50	< 0.03	< 0.03	-	-
Pyrene	mg/kg dry wt	1.13	< 0.03	< 0.03	-	-

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample. [KBIs:5786,2805,2695]	0.010 - 0.05 mg/kg dry wt	1-3
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	1-3



These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

This report must not be reproduced, except in full, without the written consent of the signatory.

A handwritten signature in blue ink that reads "Carole Rodgers-Carroll". The signature is written in a cursive style with a large initial 'C'.

Carole Rodgers-Carroll BA, NZCS
Client Services Manager - Environmental Division



ANALYSIS REPORT

Client:	Pattle Delamore Partners Limited	Lab No:	1459334	SPV1
Contact:	J Conway C/- Pattle Delamore Partners Limited PO Box 9528 Newmarket AUCKLAND 1149	Date Registered:	06-Aug-2015	
		Date Reported:	12-Aug-2015	
		Quote No:		
		Order No:		
		Client Reference:	A01964152	
		Submitted By:	Scott Nicol	

Sample Type: Soil						
Sample Name:		SS20.1	SS20.3	SS20.8	SS20.11	SS20.17
		29-Jul-2015	29-Jul-2015	29-Jul-2015	29-Jul-2015	29-Jul-2015
Lab Number:		1459334.1	1459334.2	1459334.3	1459334.4	1459334.5
Total Recoverable Arsenic	mg/kg dry wt	4	5	4	2	3
Total Recoverable Lead	mg/kg dry wt	18.3	89	36	22	12.7
Sample Name:		SS20.20	SS20.21			
		29-Jul-2015	29-Jul-2015			
Lab Number:		1459334.6	1459334.7			
Total Recoverable Arsenic	mg/kg dry wt	3	4	-	-	-
Total Recoverable Lead	mg/kg dry wt	15.6	54	-	-	-

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-7
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-7
Total Recoverable Arsenic	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	1-7
Total Recoverable Lead	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.4 mg/kg dry wt	1-7

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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Ara Heron BSc (Tech)
Client Services Manager - Environmental Division



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised. The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.



ANALYSIS REPORT

Client:	Pattle Delamore Partners Limited	Lab No:	1459677	SPV1
Contact:	J Conway C/- Pattle Delamore Partners Limited PO Box 9528 Newmarket AUCKLAND 1149	Date Registered:	06-Aug-2015	
		Date Reported:	13-Aug-2015	
		Quote No:		
		Order No:		
		Client Reference:	A01964152	
		Submitted By:	Scott Nicol	

Sample Type: Soil

Sample Name:	SS21.1	SS21.3	SS21.9	SS21.14	SS21.17
29-Jul-2015	29-Jul-2015	29-Jul-2015	29-Jul-2015	29-Jul-2015	29-Jul-2015
Lab Number:	1459677.1	1459677.2	1459677.3	1459677.4	1459677.5
Total Recoverable Arsenic mg/kg dry wt	4	3	3	< 2	24
Total Recoverable Lead mg/kg dry wt	50	17.5	54	16.5	210

Sample Name:	SS21.20	SS21.25	SS21.26	SS21.27	SS21.28
29-Jul-2015	29-Jul-2015	29-Jul-2015	29-Jul-2015	29-Jul-2015	29-Jul-2015
Lab Number:	1459677.6	1459677.7	1459677.8	1459677.9	1459677.10
Total Recoverable Arsenic mg/kg dry wt	8	5	3	12	8
Total Recoverable Lead mg/kg dry wt	27	17.7	52	43	490

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-10
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-10
Total Recoverable Arsenic	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	1-10
Total Recoverable Lead	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.4 mg/kg dry wt	1-10

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

This report must not be reproduced, except in full, without the written consent of the signatory.

Martin Cowell - BSc
 Client Services Manager - Environmental Division



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised. The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.



BULK SAMPLE IDENTIFICATION CERTIFICATE

Job Number: 15-010782 Certificate Issue Date: 6/08/2015

Date Samples Received: 04/08/2015
No of Samples: 28

Sampled By: Client
Obtained: Submitted by client

Date Analysed: 05/08/2015, 06/08/2015
Analyst: Laura Thomas, Adam Ngawati
Method: AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples

Client: Pattle Delamore Partners Ltd
Client Address: Level 4, 235 Broadway, Newmarket, Auckland 1023

Client Ref No: A01964152
Contact: James Conway
Site Address: -

We examined the following sample(s) using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including Dispersion Staining Techniques. The result(s) in this certificate relate(s) to the sample(s) as received.

GLOSSARY

CHRYSTOLITE (WHITE ASBESTOS) - CROCIDOLITE (BLUE ASBESTOS) - AMOSITE (BROWN ASBESTOS) - TREMOLITE, ANTHOPHYLLITE & ACTINOLITE (LESS COMMON ASBESTOS FIBRE TYPES)

Where non-asbestos fibres and the product type are listed, this is to help in the interpretation of results and are the opinion of the analyst only.

Where the sampling is not conducted by Dowdell & Associates Ltd, the information indicated is that supplied by the client. Dowdell & Associates Ltd cannot be held responsible for sampling errors where the sample is taken by others.

For soil samples, note that New Zealand has no specific guidelines with regard to asbestos content in soils. However, we recommend that the Australian Government's enHealth Council's Document 'Management of Asbestos in the Non-Occupational Environment' – 2005 and the (DOH) WA's 'Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia – May 2009 be consulted.

NOTE: This report must not be altered, or reproduced except in full.



Analyst: <i>L Thomas</i> <i>Adam Ngawati</i>	Name: Laura Thomas, Adam Ngawati
--	----------------------------------

Approved By: <i>E Sheldon</i>	Name: Emrhys Sheldon
-------------------------------	----------------------

15-010782 Results

Laboratory Reference	Sample Ref / Description	Sample size as received	Sample Weight Analysed	Result	Comments
45650	1. SS21.1 Soil	105 g	104.3g	No Asbestos detected	n/a
45651	2. SS21.2 Soil	115 g	98.6g	No Asbestos detected	n/a
45652	3. SS21.3 Soil	230 g	114.4g	No Asbestos detected	n/a
45653	4. SS21.4 Soil	155 g	99.6g	No Asbestos detected	n/a
45654	5. SS21.5 Soil	175 g	100.4g	No Asbestos detected	n/a
45655	6. SS21.6 Soil	130 g	100.3g	No Asbestos detected	n/a
45656	7. SS21.7 Soil	90 g	90.0g	Chrysotile	Loose fibre bundle, Sample re-analysed by Adam Ngawati with similar results obtained.
45657	8. SS21.8 Soil	170 g	100.0g	No Asbestos detected	n/a
45658	9. SS21.9 Soil	180 g	99.6g	No Asbestos detected	n/a
45659	10. SS21.10 Soil	100 g	100.0g	No Asbestos detected	n/a
45660	11. SS21.11 Soil	182 g	99.7g	No Asbestos detected	n/a
45661	12. SS21.12 Soil	140 g	104.0g	No Asbestos detected	n/a
45662	13. SS21.13 Soil	112 g	100.0g	No Asbestos detected	n/a
45663	14. SS21.14 Soil	170 g	100.6g	No Asbestos detected	n/a
45664	15. SS21.15 Soil	210 g	100.7g	No Asbestos detected	n/a

15-010782 Results

Laboratory Reference	Sample Ref / Description	Sample size as received	Sample Weight Analysed	Result	Comments
45665	16. SS21.16 Soil	145 g	101.5g	No Asbestos detected	n/a
45666	17. SS21.17 Soil	160 g	100.0g	No Asbestos detected	n/a
45667	18. SS21.18 Soil	180 g	102.4g	No Asbestos detected	n/a
45668	19. SS21.19 Soil	180 g	101.0g	No Asbestos detected	n/a
45669	20. SS21.20 Soil	165 g	99.0g	Amosite	Loose fibre bundle, Sample re-analysed by Adam Ngawati with similar results obtained.
45670	21. SS21.21 Soil	185 g	101.2g	No Asbestos detected	n/a
45671	22. SS21.22 Soil	190 g	100.6g	No Asbestos detected	n/a
45672	23. SS21.23 Soil	145 g	104.9g	No Asbestos detected	n/a
45673	24. SS21.24 Soil	145 g	100.9g	No Asbestos detected	n/a
45674	25. SS21.25 Soil	190 g	103.6g	No Asbestos detected	n/a
45675	26. SS21.26 Soil	170 g	103.9g	No Asbestos detected	n/a
45676	27. SS21.27 Soil	170 g	103.0g	No Asbestos detected	n/a
45677	28. SS21.28 Soil	155 g	102.8g	No Asbestos detected	n/a



BULK SAMPLE IDENTIFICATION CERTIFICATE

Job Number: 15-010702 Certificate Issue Date: 4/08/2015

Date Samples Received: 03/08/2015
No of Samples: 22

Sampled By: Client
Obtained: Submitted by client

Date Analysed: 03/08/2015, 04/08/2015
Analyst: Adam Ngawati, Laura Thomas
Method: AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples

Client: Pattle Delamore Partners Ltd
Client Address: Level 4, 235 Broadway, Newmarket, Auckland 1023

Client Ref No: A01964152
Contact: James Conway
Site Address: -

We examined the following sample(s) using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including Dispersion Staining Techniques. The result(s) in this certificate relate(s) to the sample(s) as received.

GLOSSARY

CHRYSTOLITE (WHITE ASBESTOS) - CROCIDOLITE (BLUE ASBESTOS) - AMOSITE (BROWN ASBESTOS) - TREMOLITE, ANTHOPHYLLITE & ACTINOLITE (LESS COMMON ASBESTOS FIBRE TYPES)

Where non-asbestos fibres and the product type are listed, this is to help in the interpretation of results and are the opinion of the analyst only.

Where the sampling is not conducted by Dowdell & Associates Ltd, the information indicated is that supplied by the client. Dowdell & Associates Ltd cannot be held responsible for sampling errors where the sample is taken by others.

For soil samples, note that New Zealand has no specific guidelines with regard to asbestos content in soils. However, we recommend that the Australian Government's enHealth Council's Document 'Management of Asbestos in the Non-Occupational Environment' – 2005 and the (DOH) WA's 'Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia – May 2009 be consulted.

NOTE: This report must not be altered, or reproduced except in full.



Analyst: <i>Adam Ngawati</i> <i>L Thomas</i>	Name: Adam Ngawati, Laura Thomas
--	----------------------------------

Approved By: <i>E Sheldon</i>	Name: Emrhys Sheldon
-------------------------------	----------------------

15-010702 Results

Laboratory Reference	Sample Ref / Description	Sample size as received	Sample Weight Analysed	Result	Comments
45349	1. SS20.1 Soil	200 g	100.9g	No Asbestos detected	n/a
45350	2. SS20.2 Soil	220 g	101.2g	No Asbestos detected	n/a
45351	3. SS20.3 Soil	180 g	103.7g	No Asbestos detected	n/a
45352	4. SS20.4 Soil	160 g	101.9g	No Asbestos detected	n/a
45353	5. SS20.5 Soil	200 g	101.2g	Chrysotile	Loose fibre bundle, Sample re-analysed by Adam Ngawati with similar results obtained.
45354	6. SS20.6 Soil	180 g	100.2g	No Asbestos detected	n/a
45355	7. SS20.7 Soil	200 g	101.9g	No Asbestos detected	n/a
45356	8. SS20.8 Soil	170 g	100.1g	No Asbestos detected	n/a
45357	9. SS20.9 Soil	200 g	100.9g	Chrysotile	Loose fibre bundles
45358	10. SS20.10 Soil	215 g	100.9g	No Asbestos detected	n/a
45359	11. SS20.11 Soil	160 g	102.2g	Chrysotile	Very small fibre bundle. Sample re-analysed by L, Thomas, similar results obtained
45360	12. SS20.12 Soil	175 g	102.9g	No Asbestos detected	n/a
45361	13. SS20.13 Soil	190 g	102.7g	Chrysotile	Loose fibre bundles
45362	14. SS20.14 Soil	150 g	100.9g	No Asbestos detected	n/a
45363	15. SS20.15 Soil	184 g	100.2g	No Asbestos detected	n/a

15-010702 Results

Laboratory Reference	Sample Ref / Description	Sample size as received	Sample Weight Analysed	Result	Comments
45364	16. SS20.16 Soil	170 g	100.5g	No Asbestos detected	n/a
45365	17. SS20.17 Soil	220 g	101.0g	No Asbestos detected	n/a
45366	18. SS20.18 Soil	190 g	100.3g	No Asbestos detected	n/a
45367	19. SS20.19 Soil	220 g	103.9g	No Asbestos detected	n/a
45368	20. SS20.20 Soil	210 g	101.5g	No Asbestos detected	n/a
45369	21. SS20.21 Soil	180 g	100.5g	No Asbestos detected	n/a
45370	22. HA20.1/1 Soil	135 g	100.0g	Chrysotile Crocidolite	Sample re-analysed by L, Thomas, similar results obtained

Appendix B
Landfill Manifest Form

A01964152 Landfill Manifest Form

The truck described below left the site at Hudson Bay Road, Hobsonville, Auckland, at the time shown below to transport soil to the Redvale Landfill.

Signed:on behalf of The Contractor
(Excavator Operator/Truck Driver)

Truck No:.....

Truck Registration Number:

Time: am/pm

Date: / /2015

NO LOAD WILL BE ALLOWED INTO _____ LANDFILL WITHOUT THIS FORM.
(This form must be signed by the Landfill Weighbridge).

LANDFILL WEIGHBRIDGE

Load Weight..... Time Received.....am/pm

Signed..... (Weighbridge Operator) Date.....

NB: If a spillage of this material occurs during transport, phone Nerena Rhodes of PDP immediately at (09) 523 6900.

THIS FORM MUST BE RETURNED TO PATTLE DELAMORE PARTNERS LTD:

235 Broadway, Newmarket, AUCKLAND 1023

PO BOX 9528, Newmarket, AUCKLAND 1149

Truck Drivers Briefing

The material to be transported is comprised of soils that may have been contaminated with lead, arsenic, PAH and asbestos. Each truck must be appropriately sealed and covered with tarpaulins or similar to ensure there is no spillage of material (or any leachate from the material) onto the road during transport.

If a spillage of the material occurs during transport you must immediately notify Nerena Rhodes of Pattle Delamore Partners Limited, phone (09) 523 6900.

ANY SPILLAGE MUST BE REPORTED IMMEDIATELY

If the spilled amount is small, cleanup by shovel will be appropriate. Any spill must be scraped up and collected into a plastic bag for disposal to landfill. A shovel and broom must be kept on each truck to manage spillage. If major spillage occurs the appropriate authorities should be notified immediately.

If you are directly handling the material, you should wear appropriate PPE as described in Section 7.2 of the Remediation Plan.

Appendix C

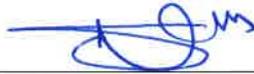
Guidelines for the Management and Removal of Asbestos Contaminated Material for Hobsonville Land Company

■ HOBSONVILLE LAND COMPANY MANAGEMENT REPORT



■ OCTOBER 2014 ■ HOBSONVILLE LAND COMPANY

- HOBSONVILLE LAND COMPANY MANAGEMENT REPORT
- OCTOBER 2014
- PREPARED FOR HOBSONVILLE LAND COMPANY
- AUTHOR: SIMON NESS/ SENIOR CIVIL ENGINEER/ THOMAS CIVIL AND ENVIRONMENTAL CONSULTANTS



28-10-2014

SIGNATURE

DATE

- REVIEWED BY RICHARD THOMAS / MANAGING DIRECTOR / THOMAS CIVIL AND ENVIRONMENTAL CONSULTANTS



28.10.14.

SIGNATURE

DATE

Disclaimer: Thomas Civil and Environmental Consultants Ltd (TCEC) has prepared this report for the use of Hobsonville Land Company in accordance with the usual care and thoroughness of the consulting profession. It is prepared in accordance with the scope of work and for the purpose outlined in the scope of works dated October 2014. This report was prepared for the information obtained and conditions encountered at that time. TCEC disclaims responsibility for any changes that may have occurred after this time. This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioner's.

GUIDELINES FOR THE MANAGEMENT AND REMOVAL OF ASBESTOS CONTAMINATED MATERIAL FOR HOBSONVILLE LAND COMPANY

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GUIDELINES FOR THE MANAGEMENT AND REMOVAL OF ASBESTOS CONTAMINATED MATERIAL FOR HOBSONVILLE LAND COMPANY

This document has been prepared by Thomas Civil and Environmental Consultants to provide guidance for the identification, investigation, remediation and management of asbestos contaminated materials found onsite.

These procedures based on both the SafeWork Australian model code of practice, "how to safely remove asbestos" and the New Zealand Demolition and Asbestos Association guidelines (NZDAA), are at the request of Hobsonville Land Company in order to apply the highest safety standards to ensure a diligent and careful approach to the asbestos management.

Asbestos is a contaminant whose toxicology is such that it primarily affects humans rather than being a risk to the environment and poses a human health risk through the inhalation of its fibres. If deposited in the lungs, the fine fibres can initiate diseases that take many years to produce major health effects. These effects include asbestosis, lung cancer and mesothelioma. These impacts tend to be the result of higher levels of exposure for longer periods, most often occupational, but mesothelioma can also result from low level exposures.

Asbestos will not degrade over time to form less harmful materials and is most dangerous fibres when physically disturbed and fibres can be released.

Friable asbestos is defined as material that can be easily crumbled by hand pressure to release fibres. This may be due to its form (loose insulation) or as a result of damage or deterioration.

Removal of friable asbestos and certain other categories of work must be carried out only by or under the direct supervision of a person fully trained in asbestos removal work and holding a *Certificate of Competence for restricted work*. This person must remain on the site at all times.

Restricted work involving asbestos **must** be notified to the Work Safe New Zealand - *Notification of Particular Hazardous Work*.

Regardless of whether or not it is friable, all forms of asbestos containing materials have the potential to release respirable fibres if handled incorrectly and therefore strict controls are required for all work with asbestos.

PROCEDURE FOR DISCOVERY OR DISTURBANCE OF ASBESTOS CONTAMINATED MATERIAL

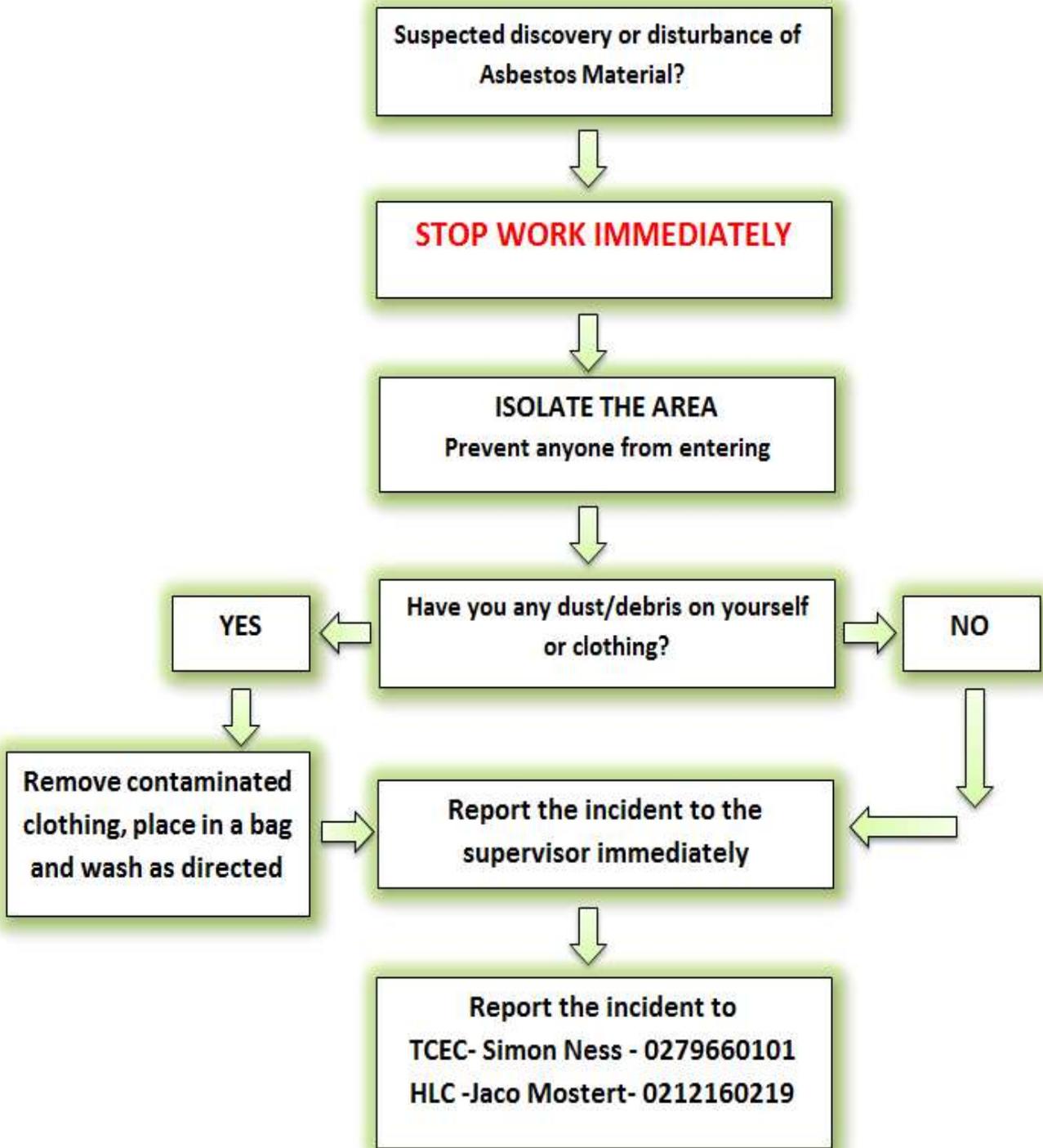
Workers and Operators

- **STOP WORK IMMEDIATELY**
- Isolate the area
- Where any Asbestos Contaminated Material debris or dust is disturbed
 - Contaminated clothing to be removed damp and place in a bag and labelled to indicate the presence of asbestos.
 - Clothing to be sent to a commercial laundering facility equipped to launder asbestos contaminated clothing, and not laundered in homes.
- **Report the incident** to the supervisor
- **Do not** - attempt to remediate the site
- **Do not** - pick-up, remove bury or dispose of Asbestos Contaminated Material in domestic waste.
- **Do not** - break, cut or drill.

Supervisors

- **STOP WORK IMMEDIATELY**
- Isolate the area of possible contamination as to not contaminate the site further.
- Restrict access to all staff until possible Asbestos Contaminated Material has been identified.
- Contact TCEC and HLC
 - > TCEC- Simon Ness – 0279660101
 - > HLC -Jaco Mostert- 0212160219
- No works to continue until validation is received that the site is clear.

Asbestos Contaminated Material (ACM) Discovered Onsite Procedure



Printable version available in the appendix, for use in site offices.

DISTURBANCE AND DISCOVERY OF ASBESTOS ON SITE

To reduce the likelihood of accidental disturbance or discovery of suspected asbestos containing material, the following procedures are to be adhered to.

All excavations, in identified areas, are to make use of a spotter to assist in identifying potential Asbestos Containing Materials.

Spotters are a proven method for identifying hazards, but spotters themselves can be at risk of injury or even death.

The following actions are to help keep spotters safe.

- Ensure that spotters and drivers agree on hand signals before work commences. (examples listed in appendix)
- ***Instruct spotters to always maintain visual contact with the vehicle operator.***
- Spotters to stand close to the area to be excavated, but outside the arc of operation of the excavator.
- Operators to stop work immediately if they lose sight of the spotter.
- Spotters are not to have additional duties while they are acting as spotters.
- Instruct spotters not to use mobile phones, headphones, or other items which could pose a distraction during activities.
- Spotters are to wear the required PPE – safety boots, high-visibility clothing, hardhat, eye protection and a P2 mask.

PLANNING AND PREPARATION FOR THE SAFE REMOVAL OF ASBESTOS

Hobsonville Land Company (HLC) will conduct an independent Asbestos survey including:

- Creating an Asbestos Register
- Location and site plan of all ACM
- Management and control actions and recommendations
- Air monitoring results

Asbestos Removal Company must provide:

- Asbestos removal competency register
- Asbestos removal control plan (see NZDAA guidelines for content)
- Notification of particular hazardous work.
- Who will be removing the asbestos-contaminated materials?
- What equipment will be used to remove the asbestos-contaminated materials?
- How it will be removed safely.
- Decontamination procedures for personnel and equipment.
- Disposal procedures

On completion of the Asbestos removal an independent clearance test will be conducted to certify that all ACM have been removed prior to demolition.

In any activity involving the removal of asbestos-contaminated materials, the procedures adopted must allow for the containment of asbestos. All practicable steps must be taken to ensure that workers, adjoining properties and local residents are not exposed to asbestos fibres.

PERSONAL PROTECTIVE EQUIPMENT

There are **legal requirements** placed on employers to ensure that their employees and others in the vicinity are adequately protected from the effects of exposure to asbestos fibres.

Good occupational hygiene practice requires that all practicable efforts are taken to prevent asbestos fibres from entering the air. In circumstances where it is impracticable to prevent asbestos from entering the atmosphere, suitable protection should be worn.

Respiratory Protection

The **minimum** suitable respiratory protection is a P2 half face-piece respirator with a particulate filter. Particulate filters issued to individuals are for their exclusive use. **Below are examples of suitable respirators.** Those wearing such a mask must be clean shaven and should be face fit tested to ensure a good fit.

NZDAA does not recognise or recommend the use of P1 filters for the removal of Asbestos-contaminated materials.



Protective Clothing

Persons involved in working with asbestos should always wear protective clothing that resists penetration by asbestos fibres and prevents contamination of personal clothing.

Disposable or single-use protective clothing type "P" Particulate Body Protection is to be used for one job and discarded as asbestos waste.

The protective clothing must cover the body and fit snugly at the neck, wrists and ankles and cover the head by having an attached hood.

Protective clothing is to be maintained in good condition and if torn or damaged, is immediately replaced.

Contaminated PPE should not be worn outside the asbestos work area under any circumstances.

NOTE: Because of the impervious nature of this type of clothing the wearer may become affected by heat stress. The employer should ensure that workers are knowledgeable about the signs and symptoms of heat disorders and the means to prevent illness caused by heat.

Footwear

Footwear should be adequate for the type of work being undertaken. Steel-capped work boots or gumboots.

Gloves

Gloves provided should be made of impervious material for ease of cleaning, disposable gloves may be more acceptable, and these are to be taped at the wrists to seal the suit.

NOTE: Extended contact with asbestos can lead to asbestosis, wash hands thoroughly.



CONTAINMENT

This section outlines the steps necessary for the employer to ensure, as far as is practicable, the prevention of contamination by asbestos in any workplace and to ensure that asbestos-containing materials are stored, labelled and disposed of correctly.

- Spray all asbestos sheeting with pigmented PVA sealant with low pressure spray equipment.
- **Do not** break up the sheeting.
- **Do not** throw sheeting to the ground or use chutes.
- **Do not** slide sheeting across other sheets as they may release asbestos fibres.
- **Do not** use angle grinders or other power tools.
- Remove anchoring screws/bolts from the roofing sheets using an oxy-acetylene torch or another suitable method or device that will not damage the sheet.
- High pressure water jets/guns must not be used because of the potential to spread asbestos waste in the surrounding environment
- **Do not** dispose of ACM into domestic waste or bury. (Other than an approved disposal site).

Once the Asbestos waste bags have been removed from the asbestos work area, they should be removed from the site by a person who holds a New Zealand Driver Licence endorsement for Class D (Dangerous Goods).

HANDLING OF NON-FRIABLE ASBESTOS

Non-friable asbestos products have been compounded using asbestos mixed with cement or other hard bonding materials.

These products encountered include, but are not limited to:

- Flat or corrugated compressed asbestos cement sheeting. (Super 6 or Galbestos)
- Asbestos cement pipes
- Floor or wall coverings.
- Malthoid waterproof coatings.

Removal of Asbestos Cement Pipes

In most cases, asbestos cement pipes are considered non-friable. However fibres can be released into the air and surrounding environment when the pipes are crushed, damaged, mishandled or in a poor condition.

To prevent the release of asbestos fibres, the contractor must **not** allow the pipe to be damaged, crushed or shattered in any way during removal.

The contractor must **not** sand, chip, grind or use any power tools on the piping during its removal.

The asbestos cement (AC) piping can generally be removed in sections, split at the collar (or sleeve) or with a chain cutter and removed carefully by lifting out of the excavated shaft. The piping must be kept wet at all times

NOTE: When AC piping is damaged, the removal and remediation work is now defined as "Restricted" and will require the removal and decontamination of the surrounding soil.

Sheeting Removal

AC sheeting is liable to shatter without warning under a person's weight. For this reason, roofs that are sheathed in AC sheeting are known as "brittle roofs".

- The removal of AC sheeting from a roof should only be undertaken by people competent to work safely at heights using appropriate controls such as scaffolding, cherry picker (EWP) or a fall prevention system.
- Identification and protection of all open voids, including clear sheeting, to prevent asbestos workers from falling through.
- Suitable gangways are installed.
- Prior to the removal process, AC sheets should be finely sprayed with PVA using low-pressure spray equipment. The PVA must be dry before sheet removal begins, to eliminate a risk of a worker slipping or falling from a roof.
- Anchoring bolts/screws should be removed from the roofing sheets using an oxy-torch or other suitable device that will not significantly damage the sheet. All nails and bolts removed should be disposed of as asbestos waste.
- AC sheets should be removed with minimal breakage and should be lowered to the ground, **not dropped**.
 - Elevated work platforms (EWPs) to be used to safely access and lower the AC sheets to the ground.
- All asbestos-containing waste should be kept wet, wrapped in plastic sheeting 200µm thick or otherwise sealed in labelled bags and removed from the site as soon as possible using bins pre-lined with a minimum of two layers of 200µm sheeting.
- Identification and protection of all open voids, including clear sheeting, to prevent asbestos workers falling through.
- Suitable gangways being installed if asbestos workers must work from the roof to prevent workers from walking directly on the asbestos sheeting. All asbestos removal workers must wear suitable fall arrest harnessing.

CONTAMINATED SOIL ACTION PLAN

It is the responsibility of the contractor removing the ACM to ensure that all personnel involved are made fully aware of and comply with the requirements of this Action Plan and the AMP.

All identified or suspected ACM shall not be handled in any manner unless by suitably qualified personnel wearing the appropriate personal protective equipment (PPE)

Failure to comply with these requirements may result in the works being halted until HLC and its agents are satisfied that these requirements have been addressed.

The treatment, containment or removal of any ACM shall be undertaken by an approved contractor under the instruction or supervision of HLC or their agent.

This process is suitable for all types of asbestos contamination.

These guidelines are listed below:

Pre-start

- Identify and report on extent of contamination, requirements and register.
- From the Report, management and Action plan's compile a complete remediation methodology.
- Complete a competency register of all personnel conducting works in the restricted area.
- Prepare a sediment control plan.
- Complete a notification of works.

Construction

- Contain the site area to prevent the unintentional entry by members of the public or other non-essential personnel.
- Warning signage is to be erected at all entrances and only removed once work has been completed.
- Carry out air monitoring to confirm the containment procedures are working, if high readings are recorded work is to stop immediately and remediation processes evaluated.
- For dust suppression during soil decontamination, the topsoil should be dampened down to minimise the generation of dust and all visible pieces of asbestos-contaminated materials should be picked up individually so that the risk of asbestos fibre inhalation is effectively eliminated.
- The method of dampening should be such so as not to cause pooling or run-off of contaminated water.
- Truck bins and stockpiles to be poly lined with minimum thickness 200µm.
- Follow all decontamination procedures and use appropriate PPE.
- Site access and egress is to be controlled to avoid further contamination.
- A visual walkover is to be undertaken to confirm site is clear of ACM.

Completion

- Soil sampling and Validation. (may require further removal)
- Contaminated material must be disposed of as Asbestos waste at a registered tip site and Landfill tip dockets to be retained.
- Certification of completion by contractor

POST-BUILDING DEMOLITION ASBESTOS ACTION PLAN

Introduction

The purpose of this action plan is to provide guidelines for the management and safe removal of any asbestos containing material (ACM) from sites where buildings previously identified to contain ACM have been removed from the site but where on-grade slabs, ancillary buildings, building foundations, etc remain.

It is a requirement of Hobsonville Land Company Ltd (HLC) that all ACM identified in the buildings, as detailed in the Asbestos Survey Reports by Dowdall and Associates, is contained or removed, as required, prior to the removal or demolition of any building.

However, the nature of the building construction and maintenance since original construction means that it may be possible that ACM may be present on or within the subsoil layers. While every practicable effort has been made by HLC to identify and remove the ACM, it is possible that ACM may be exposed during the removal of on-grade driveway slabs and sub-surface foundations.

The treatment, containment or removal of any ACM shall be undertaken by an approved contractor under the instruction or supervision of HLC or their agent.

Contractor's Responsibility

It is the responsibility of the contractor removing the on-grade driveways, slabs, foundations, etc to ensure that all personnel involved are made fully aware of the requirements of this Asbestos Management Plan

If the contractor identifies any material that it believes may be ACM then it shall treat the material as such until confirmed otherwise.

All identified or suspected ACM shall not be handled in any manner unless by suitably qualified personnel wearing the appropriate personal protective equipment (PPE)

Failure to comply with these requirements may result in the works being halted until HLC and its agents are satisfied that these requirements have been addressed.

Specific Requirements for Managing and handling ACM

The following specific actions, requirements or procedures shall be followed for the identification, treatment and removal of the ACM and the removal of the slabs, driveways, foundations, etc from site:

- Prior to the commencement of any physical works on site a visual inspection of the site shall be undertaken and any ACM identified shall be pointed out to HLC or their agents.
- HLC or their agents will undertake the appropriate removal of any ACM identified and approval will be given for works to commence.
- If, during the demolition of any structures or uplifting of any concrete slabs or foundations, etc , ACM is exposed or material suspected of being ACM is expose, then that particular operation shall cease and HLC or their agents shall be notified immediately. Under no circumstances shall the ACM be handled, removed, or relocated.
- HLC or their agents will undertake the appropriate removal of the ACM identified and approval will be given for works to continue.
- The footprint area and surrounding slabs are to be scraped clean of any rubble and debris to confirm all ACM has been removed.
- At the completion of any works, the contractor shall undertake a visual inspection of the works area to ensure it is clear of any ACM.
- If any ACM is identified, HLC or their agents will undertake the appropriate removal of the ACM identified.

AIR MONITORING CONCENTRATION LEVELS

It is important to note that there are no safe exposure limits to asbestos fibres and all practicable steps must be taken to ensure that exposure to asbestos is kept and maintained as low as possible.

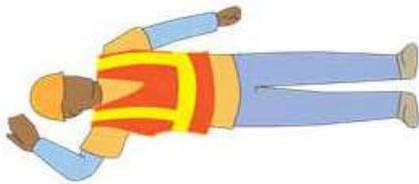
Asbestos fibre - A particle of asbestos that:

- is not less than 5 micrometres and not more than 100 micrometres in length; and
- is less than 3 micrometres in width; and
- Has a length to width ratio of not less than 3 to 1.

For background or environmental monitoring the following trigger action response plan should be applied.

Action level	Control	Action
Less than 0.01 fibres/ml	No new control measures are necessary	Continue with control measures
At 0.01 fibres/ml or more than 0.01 fibres/ml but less than or equal to 0.02 fibres/ml	1. Review	Review control measures
	2. Investigate	Investigate the cause
	3. Implement	Implement controls to eliminate or minimise exposure and prevent further release
More than 0.02 fibres/ml	1. Stop removal work	Stop removal work
	2. Notify regulator	Notify the relevant regulator by phone followed by fax or written statement that work has ceased and the results of the air monitoring
	3. Investigate the cause	Conduct a thorough visual inspection of the enclosure (if used) and associated equipment in consultation with all workers involved with the removal work
	4. Implement controls to eliminate or minimise exposure and prevent further release	Extend the isolated/barricaded area around the removal area/enclosure as far as reasonably practicable (until fibre levels are at or below 0.01 fibres/ml, wet wipe and vacuum the surrounding area, seal any identified leaks (e.g. with expandable foam or tape) and smoke test the enclosure until it is satisfactorily sealed.
	5. Do not recommence removal work until further air monitoring is conducted	<ul style="list-style-type: none"> • Do not recommence until fibre levels are at or below 0.01 fibres/ml

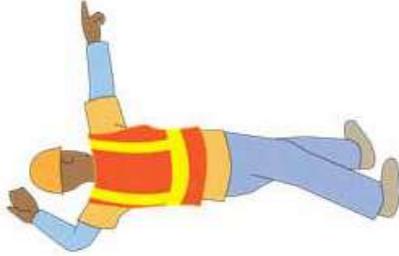
Suggested Spotter Signals



Back up



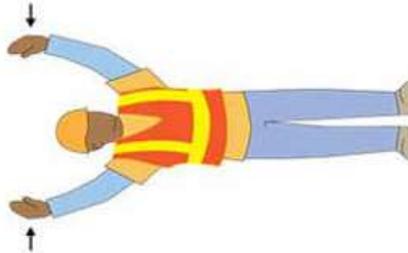
Back, turn left



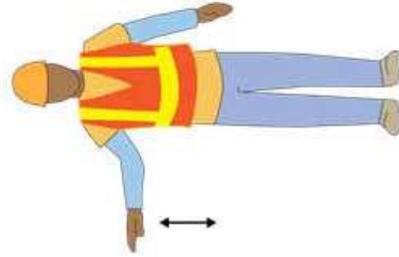
Back, turn right



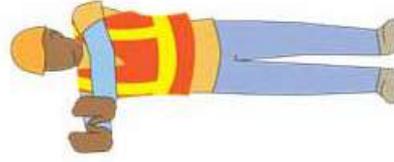
Move forward



Distance left to back



Slow down



Stop

ASBESTOS CONTAMINATED MATERIAL PROCEDURES

