

**JIWG**  
Joint Industry Working Group  
Asbestos in Soil and Construction & Demolition Materials

# ASSESSMENT AND CONTROL OF ASBESTOS RISK IN SOIL

PART 1: PROTECTION OF PERSONNEL  
WORKING ON GROUND INVESTIGATIONS

[www.ags.org.uk](http://www.ags.org.uk)  
[ags@ags.org.uk](mailto:ags@ags.org.uk)  
020 8658 8212

## **EXECUTIVE SUMMARY**

All employers have a duty to provide a safe working environment for their employees. The business of ground investigation is inherently one of discovery, and accordingly there is a possibility of encountering the unexpected, including soils which contain asbestos containing materials (ACMs), as fragments that are visible to the naked eye and/or microscopic fragments and/or fibres which may only be found on inspection in a laboratory. This over-arching legal obligation prompts employers to assess and manage potential risks related to hazardous materials, including ACMs.

Some ground investigations will not encounter Made Ground, and in many cases Made Ground investigation will be a small part of an overall investigation scope. However, ground investigation activities increase the possibility of exposure to asbestos if it is present in the soils and fibres are able to become airborne. This is particularly the case for workers who for example sample, log, prepare and test samples of Made Ground. Nevertheless, where ground investigations are undertaken at sites where there is no recorded evidence of asbestos in soils, or on sites where there is minimal concern arising from previous land use, but the site is still considered to pose a potential risk from asbestos on or in the ground, then those planning and undertaking those investigations must adequately address those risks in the planning and execution stages.

This aim of this guidance is to assist employers in their duty to protect personnel undertaking ground investigations against exposure to asbestos.

Typical ground investigations carried out on asbestos-contaminated sites are unlikely to result in exposures that are not SALI or that exceed the Control Limit. Consequently, ground investigations would only be considered Licensed Work if the work involved clearly identifiable (as determined on site) asbestos coating, asbestos insulation or AIB and, for both the latter, where the work is not Short Duration Work and, in the case of all three, where the planned sampling of soils for asbestos does not form a part of the scope.

If, during the course of routine non-licensed ground investigation work involving excavation/drilling of materials contaminated with asbestos, 'clearly identifiable original form' asbestos coating, insulation or AIB were encountered in significant quantities, work should stop and a reassessment of the site should be carried out before further ground investigation work is undertaken. If the surface of the site is badly contaminated by such ACMs, some preliminary remediation works may be required in order to facilitate safe access.

If works are not considered Licensed Work (LW), whether works are notifiable (i.e. Notifiable Non-Licensed Work - NNLW) depends on whether the work meets any of the exemption criteria set out in regulation 3(2) of CAR 2012. To be exempt from the requirements to notify etc., the work must be either:

- short, non-continuous maintenance activities in which only non-friable materials are handled, or
- removal without deterioration of non-degraded materials in which the asbestos fibres are firmly linked in a matrix, or
- the collection and analysis of samples to ascertain whether a specific material contains asbestos.

The wording of the exemptions is very important. One type of exemption applies to 'maintenance' activities and the other applies to 'removal' activities (in the context of this guidance, this includes activities that may disturb asbestos). All Non-Licensed Work (NLW) (with the exception of sampling – which has its own exemption) will fall into one of these two categories.



Short non-continuous is not defined in CAR 2012 so there are no specified limits on the maintenance work duration or frequency. Short non-continuous work can include small routine maintenance tasks, or a series of similar small tasks, or work that is carried out as part of a larger maintenance activity. (Note the definition of 'short-non continuous work' is not the same as that used for 'Short Duration Work' for the purposes of deciding if work is licensable.)

Non-friable is also not defined. AIB and asbestos cement are regarded as non-friable ACMs in this instance as they have a certain level of integrity to retain fibres. Note that being non-friable does not mean that the material will not release fibres under all circumstances. Non-friable materials may release fibres if damaged or subjected to high intensity processes. Most, if not all maintenance work on "non-friable" materials that is NLW will be non-notifiable.

So, if ground investigations involve collection of samples, they will be NLW, unless the work is not SALI and the Control Limit will be exceeded. If no sampling is planned for the purposes of determining the presence of asbestos, and they take place on land known to be contaminated with 'clearly identifiable original form' asbestos coatings insulation and/or AIB, loose fibrous asbestos debris and materials containing free dispersed fibres/fibre bundles, they are likely to be NNLW as they are friable, especially when there is a significant amount of contamination present.

Prevention of exposure must always be the first thing to consider, before progressing to the decision whether the work is LW, NLW or NNLW i.e. could non sampling work be completed after asbestos remediation or in other areas not known to be contaminated with asbestos? Regardless of whether work is NLW, NNLW or LW these activities should be carried out in such a way that disturbance to ACMs is minimal. The important points to focus on is the approach to planning any investigation work, undertaking a risk assessment, training personnel and implementing controls.

This guidance is split into two parts:

- Part 1 provides information on the assessment and control of asbestos in soil for the protection of personnel working on ground investigations and
- Part 2 provides information for the protection of personnel working in laboratories associated with testing samples obtained from those investigations.

Although every effort has been made to check the accuracy of the information and validity of the guidance given in this document, neither the members of the AGS Working Groups, nor the AGS accept any responsibility for mis-statements contained herein or misunderstanding arising here from.

## Acknowledgements

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### Main Authors

Marian Markham	Jacobs & AGS
Steve Forster	Remedia Group & Joint Industry Working Group on Asbestos in Soil and C&D Materials

### AGS Working Sub-group Members

Julian Lovell	Equipe Group
Steve Everton	Jacobs
Vivien Dent	RSK Group
Hugh Mallett	Buro Happold
Adam Latimer	Ian Farmer Associates
Timon Greenwood	Southern Testing Laboratories

## Contents

Acknowledgements .....	4
1.0 Introduction .....	8
2.0 Legislative framework.....	8
3.0 Application of CAR 2012 .....	9
4.0 Work with asbestos .....	9
5.0 Pathways and routes of exposure .....	10
5.1 Human health .....	10
5.2 Exposure limits.....	10
5.3 Moisture content and drying.....	11
6.0 Risk Assessment.....	11
6.1 Desk study and site walkover survey.....	11
6.2 Site specific asbestos risk assessment.....	12
6.3 Dynamic asbestos risk assessment.....	13
6.4 Asbestos coatings, asbestos insulation and AIB.....	14
6.5 Short duration work .....	14
6.6 Level of likely exposure to asbestos fibres .....	14
6.7 Ground investigation scenarios.....	15
7.0 Plan of Work (Method Statement).....	20
7.1 Designated areas .....	20
7.2 Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE) .....	21
7.3 Personal decontamination and use of decontamination facilities.....	22
7.4 Emergency Procedures.....	23
7.5 Medicals.....	23
7.5.1 Notifiable Non-Licensed Work (NNLW).....	23
7.5.2 Licensable Work (LW).....	23
8.0 Notification and Licensing .....	23
9.0 Training.....	24
9.1 Asbestos Awareness.....	24
9.2 Additional Training .....	24
10.0 Insurance .....	24
11.0 Sampling and Logging.....	25

11.1	Sampling .....	25
11.2	Logging of Made Ground containing asbestos .....	26
11.3	Air monitoring.....	26
12.0	Waste disposal.....	26
13.0	Laboratory management .....	27
14.0	Case studies .....	28
14.1	Geoenvironmental investigation of Made Ground .....	28
14.2	Geotechnical investigation of bedrock below Hazardous Waste landfill .....	30
14.3	Geoenvironmental investigation using trial pits .....	32
15.0	Check List .....	34
16.0	References and Further Reading .....	35
	APPENDIX A: PROCEDURE IF SUSPECTED ASBESTOS IS <b>UNEXPECTEDLY</b> ENCOUNTERED DURING GROUND INVESTIGATION.....	36

## Part 2            Protection of personnel working in geotechnical and geoenvironmental laboratories

### Abbreviations and acronyms

AAT	Asbestos Awareness Training
ACM(s)	Asbestos-Containing Material(s)
ACOP	Approved Code of Practice
AGS	Association of Geotechnical & Geoenvironmental Specialists
AIB	Asbestos Insulating Board
APF	Assigned Protection Factor
BOHS	British Occupational Hygiene Society
BS	British Standard
CAR 2012	Control of Asbestos Regulations 2012
CAR-SOIL	CL:AIRE (2016). Control of Asbestos Regulations 2012 Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials Industry Guidance
CDM 2015	Construction (Design and Management) Regulations 2015
CIRIA	Construction Industry Research and Information Association
CL:AIRE	Contaminated Land: Applications in Real Environments
DCU	Decontamination Unit
DST	Decision Support Tool
EA	Environment Agency
FFP3	Filtering Facepiece with P3 high-efficiency particle filtration
HSE	Health and Safety Executive
HSENI	Health and Safety Executive for Northern Ireland
LARC	Licensed Asbestos Removal Contractor
LW	Licensable Work
NLW	Non-Licensable Work
NNLW	Notifiable Non-Licensable Work
NRW	Natural Resources Wales
PACM	Presumed Asbestos-Containing Material
PPE	Personal Protective Equipment
RPE	Respiratory Protective Equipment
SALI	Sporadic and of Low Intensity
SCA	Standing Committee of Analysts
SEPA	Scottish Environmental Protection Agency
STEL	Short Term Exposure Limit
TNA	Training Needs Analysis
UKAS	United Kingdom Accreditation Service

### Glossary

Desk Study	Office-based collation of historical and current records about a site including maps, photos, previous intrusive investigations, geology, hydrogeology, hydrology etc to inform a ground model or a conceptual site model. This is the Desk Study part of BS 5930 term “Phase 1” and is the Desk Study part of BS 10175 “preliminary investigation”.
Made Ground	From BS 5930 “anthropogenic ground in which the material has been placed without engineering control and/or manufactured by man in some way, such as through crushing or washing, or arising from an industrial process”.
Engineered Fill	From BS 5930 “anthropogenic ground in which the material has been selected, placed and compacted in accordance with an engineering specification”.
Ground Investigation	The wider sense of investigation of the site, which includes desk studies, site walkovers, utilities surveys and intrusive field and laboratory work.

## 1.0 Introduction

The British Standard BS 10175:2011+A2:2017 states that, potentially, 80% to 90% of the United Kingdom's brownfield sites might be contaminated to a degree by asbestos from fly-tipping of wastes, demolition, repair, and importation of fill materials. This may be just one small fragment of ACM, or widespread uncontrolled historical burial of ACMs. Add to this recycled aggregates from demolition and recycled soils used in construction (embankments, landscaping, noise bunds, piling mats etc) and even sediments from urban areas, and it is reasonably foreseeable that anything except genuine greenfield sites without any Made Ground could potentially contain asbestos.

Frequently, no ACMs are seen during fieldwork, but subsequent laboratory testing of geotechnical and geoenvironmental samples then records significant amounts of small or microscopic fragments of ACMs and/or free dispersed asbestos fibres that are invisible to the naked eye. In undertaking ground investigation, disturbance and spreading of ACMs and airborne exposure to respirable asbestos fibres could occur unwittingly because its presence is not presumed and therefore, not managed correctly by trained and competent persons with the right equipment and a safe system of work.

This AGS guidance is for use by trained and competent persons who have a working knowledge of the Control of Asbestos Regulations (CAR 2012), its ACOP L143, CAR-SOIL and its Decision Support Tools (DSTs). Members are advised to take appropriate professional advice wherever and whenever necessary.

## 2.0 Legislative framework

Health & Safety Executive (HSE) legislation and guidance relating to the risk from exposure to asbestos has been principally derived from experience of managing and working with asbestos within or associated with buildings and plant/equipment, and the legal duties are more easily understood when read in that context. As a result, the existing industry guidance cannot be readily applied to asbestos in the ground (or when lying on the surface of the ground) or during a ground investigation.

Nevertheless, Regulation 5 of the Control of Asbestos Regulations (CAR 2012) applies to ground investigations. Before site works commence which involve the disturbance of the ground an employer should first undertake an assessment of historical information to determine if the land likely to be disturbed by works is likely to contain ACM and therefore the location(s), type and condition.

Regulation 6 requires employers to carry out a risk assessment to identify the risks of exposure to asbestos and sets out the requirement to record any significant findings and put in place steps to prevent, or reduce, exposure to employees.

The Joint Industry Working Group (JIWG) guidance CAR-SOIL was prepared by CL:AIRE (2016) with the support and approval of the HSE. This presents, along with certain parts of HSE's Approved Code of Practice L143, an explanation of how the legal requirements of CAR 2012 have been interpreted to apply to work with asbestos-contaminated soil and construction and demolition materials, including Made Ground. It includes definitions of "trace asbestos", to be proven by laboratory analysis, and provides an HSE-agreed risk-based method of working around the rigid definition of otherwise licensable asbestos materials as defined under Regulation 2 of CAR 2012 which are based strictly on product type. This applies only to 'clearly identifiable' original forms of asbestos coatings, asbestos insulation, and asbestos insulating board (AIB).

As with any other work activity, the HSE will expect:

- employers to be aware of their responsibilities;
- to carry out a process of risk assessment prior to commencing work;



- to implement and communicate control measures and safe systems of work in light of the assessment;
- procedures are in place for their employees to react to and deal safely with any unexpected asbestos that may be encountered during ground investigations; and
- employees to have received suitable and sufficient training.

This document provides guidance on how Employers and Employees can meet these obligations in relation to asbestos in soil within a ground investigation context.

### 3.0 Application of CAR 2012

Typically, ground investigation on most Brownfield sites is likely to encounter asbestos containing materials in Made Ground sporadically and at low / trace concentrations such that exposure in air is likely to be sporadic and of low intensity (“SALI” – defined as <0.6 fibres per cubic centimetre (f/cm<sup>3</sup>) in the air measured over a ten-minute period). On sites where the presence, nature and extent of ACMs in the Made Ground together with the nature of the ground investigation activities is such that there is a potential for exposure in air to exceed this limit, the work would fall under the CAR 2012 Regulations. Ground investigation works of this nature may be classified as any of the Asbestos Work Categories from Non-Licensed Work (NLW), Notifiable Non-Licensed Work (NNLW) or even Licensed Work (LW) depending on the nature, degree and condition of the asbestos present on or in the ground and the site activities being performed.

For example, on a site where, on the completion of a robust desk study and Conceptual Site Model (CSM) it is concluded that there is the potential for large caches of buried asbestos insulation to be disturbed or excavated, this would require works to be assessed and managed as NLW, or potentially LW, depending on the planned activities (soil sampling, with asbestos sampling included or strictly geotechnical testing only), the duration of the works and the likely concentration of respirable asbestos fibres in the atmosphere of the breathing zone of workers engaged on the work.

In certain limited scenarios, CAR 2012 may not apply to ground investigations. For example, excavating on a greenfield site with no Made Ground which, on the completion of a robust desk study and CSM indicates that the presence of asbestos is highly unlikely. In this scenario, the potential asbestos risk may be assessed as being negligible and the CAR 2012 Regulations do not apply (see CAR-SOIL Watch Point 2).

Ground investigation activities include site walkovers, trial pits, boreholes, surface surveys using ground penetrating radar, geotechnical and geoenvironmental sampling, in-situ testing, disposal of surplus soils, disposal of drilling fluids and water from developing standpipes, etc. CAR 2012 may apply to all of these activities. Ground investigation work where samples are taken for asbestos testing is always considered NLW unless an asbestos risk assessment indicates that airborne respirable asbestos fibre exposure limits (SALI/the Control Limit) are likely to be, or will be, exceeded.

### 4.0 Work with asbestos

CAR 2012 Regulation 2 describes “work with asbestos” as including:

- work which removes, repairs, or disturbs asbestos.
- work which is ancillary to such work (ancillary work).
- supervising the work referred to in the two bullet points above (supervisory work).

Ground investigation works meet the definition of “work with asbestos” when these activities remove or disturb asbestos. Removal from a site of surplus arisings of Made Ground from trial pits and boreholes for waste disposal could contain asbestos.

CAR 2012 do not provide a definition of ‘disturbance’ and application of the dictionary definition is difficult as it does not take account of asbestos being found within or bound by a soil matrix, but a reasonable approach would be to assess the work recognising the risk of ‘disturbance liable to release fibres’.

Any works which excavate and spread Made Ground and are vulnerable to being walked through and driven through could potentially release asbestos fibres and spread asbestos, e.g. by tracking contaminated material inside vehicles, welfare facilities, off site and into homes, and must be carried out in such a way that uncontrolled disturbance of asbestos and ground matrices containing asbestos fibres is minimised, thus minimising potential inhalation, and spread.

## 5.0 Pathways and routes of exposure

### 5.1 Human health

Activities specific to the ground investigation industry that could potentially disturb asbestos and therefore generate airborne respirable asbestos fibres include walking and driving across Made Ground, trial pitting, drilling boreholes, undertaking in-situ testing and sampling. Activities such as geophysical surveys, site walkovers and UXO clearance could disturb asbestos that is lying at the surface generating airborne respirable asbestos fibres if ACMs are present in dry, loose fibre form and/or if they are crushed. Sites where there is significant surface presence of asbestos may be liable to disturbance and spread of asbestos fibres around and off-site via footwear, equipment, plant, and vehicle movement.

Health risks from asbestos relate principally to the potential for release of respirable fibres into the atmosphere when disturbed and where these are subsequently inhaled. Ongoing exposures to even low concentrations of respirable asbestos fibres may present significant risks to health. Fibres may be released with dust into the air by construction activities or by the movement of pedestrians, vehicles, or construction plant, where they may be inhaled by exposed individuals.

There are also reported potential health risks from ingestion (swallowing) of asbestos, and skin corns can form from direct contact with asbestos fibres, although these risks are not considered significant for land professionals and groundworkers.

The latency period between initial exposure to asbestos and the onset of an asbestos-related disease can be many years. HSG 248 states that “Asbestos is a cumulative hazardous material; the overall risk of developing mesothelioma depends on the number of repeated exposures which occur over a lifetime. However, single occupational exposures are not without risk”. Whilst there is little evidence of known asbestos related diseases occurring in ground practitioners and groundworkers arising directly from ground investigation activities, certain ground investigation activities increase the possibility of exposure (if asbestos is present and is able to be mobilised), and particularly for workers who for example sample, log, prepare and test samples of Made Ground. Earthworks and remediation activities within Made Ground, which involve movement of much larger volumes of soil, potentially pose a higher risk to workers of exposure to airborne asbestos. Undertaking ground investigations with ACM in Made Ground with no control measures could result in repeated low exposures unwittingly.

### 5.2 Exposure limits

In the UK, CAR 2012, which are supplemented by HSE ACOP L143, set a Control Limit (Time-Weighted Average over 4 hours) concentration of 0.1 fibres/cm<sup>3</sup> of respirable asbestos fibres in the atmosphere of the breathing zone of workers engaged on work with asbestos. The Control Limit is not a ‘safe’ level and was set arbitrarily. The UK Government has progressively tightened the control limits since 1970.

Exposure from work activities involving asbestos must still be reduced to as far below the Control Limit as possible.

It is important to recognise that there is no UK level of exposure from work activities involving asbestos that can be identified as being 'safe'. The Employer has a primary duty under CAR 2012 first to prevent exposure of employees to asbestos fibres or, where this is not possible, to reduce exposure not only to below the Control Limit but to a level that is as low as is reasonably practicable (ALARP) by means other than RPE. If exposures cannot be reduced below the Control Limit by the implementation of effective working methods/control measures, PPE, including RPE, must be provided by the Employer and worn by the Employee.

For the purposes of Regulation 2(4) (definition of licensable work), for exposure to be sporadic and of low intensity, the airborne concentration of asbestos fibres should not exceed 0.6 f/cm<sup>3</sup> measured over a ten-minute period. This is sometimes referred to as the Sporadic and Low Intensity (SALI) exposure limit or, Short-Term Exposure Limit (STEL). It refers to the peak concentration for any ten minute period of duration of the work.

Uncontrolled exposure at or above either of these limits is not permitted and would be considered a breach of CAR 2012 and be required to be notified under The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR).

As ground investigation and related work activities involving asbestos are usually carried out outdoors, without standard containment and control measures, e.g. asbestos enclosures, the HSE advise that work activities involving, or potentially involving, disturbing asbestos should be designed and performed in a manner that ensures that respirable asbestos fibre concentrations are kept as far below the Control Limit as possible and that the spread of asbestos is prevented, or at least minimised.

### 5.3 Moisture content and drying

Studies have demonstrated that the addition of water to soil decreases the risk of the potential release of respirable asbestos fibres into the air. The addition of 10% water reduces it by a factor of between 2 and 10. Soil below the surface is often damp when in situ reducing the risk of fibre release. Once excavated and exposed to air, however, it may dry very quickly, significantly increasing the risk of fibre release on disturbance. Locations commonly identified on sites having this potential are excavations or intrusive exploratory hole locations, spoil, areas where any hard surfacing is removed, vehicle routes without hard standing, and open skips. Asbestos fibres can also be carried on muddy boots and clothing.

If the site presents dry soil at the surface, free dispersed asbestos fibres can easily become airborne when disturbed. Likewise, fragments of ACMs on the surface that are badly damaged, weathered and/or highly friable, such as AIB, insulation and coatings, can release large amounts of respirable asbestos fibres when disturbed. In such cases, the presence of any airborne dust is a sign of a potential immediate hazard. The potential for carrying asbestos contaminated soils into desiccating environments should also be considered, for example bringing site equipment, clothing, boots, or dirt on the skin indoors. This potential risk can be controlled by the implementation of well-designed equipment decontamination procedures, as well as robust procedures for the donning and doffing of PPE and RPE prior to entering and leaving asbestos-contaminated areas.

## 6.0 Risk Assessment

### 6.1 Desk study and site walkover survey

CAR 2012 Regulation 5 requires Employers to identify the presence of asbestos and its type and condition before any work liable to disturb asbestos on or in the ground begins. It also sets out the

requirement to arrange a survey if existing information on the presence of asbestos is incomplete or appears unreliable.

Before carrying out any ground investigation work on land involving the potential disturbance of asbestos in soil, an Employer should first undertake a preliminary assessment (desk study) of relevant information to find out if the area of land likely to be disturbed by the ground investigation is likely to contain asbestos and, if so, the likely location, distribution, type and condition of that asbestos.

If the preliminary assessment suggests that asbestos is, on balance, likely to be present in, on or within the ground, the Employer will need to carry out further investigation and analysis of representative samples of the ground to determine the presence, distribution, type, and condition of the asbestos.

For all risk assessments for the investigation of land, a robust desk study conducted by a competent person must precede the ground investigation works. This can identify where asbestos could reasonably foreseeably be present and could potentially be disturbed (BS10175 and LCRM). Local knowledge, historic maps, topography changes, landfill records, previous ground investigation data etc. can indicate previous uses of the land, i.e. brownfield and/or the presence of Made Ground, where there is a possibility that asbestos could be present.

The desk study should in normal circumstances be followed by a site walk-over survey of the site and its immediate surroundings. This would normally be expected to be a reasonably comprehensive and methodical examination of the site's surface. Amongst other things, site walk-over surveys should normally be able to identify areas of disturbed ground, areas of fill and spoil heaps, as well as derelict and demolished structures where the use of asbestos may be confirmed. The desk study information should then be used to create an initial CSM for the site.

Desk studies should include, where these are available in the case of non-domestic premises and shared parts of multiple occupancy residences, details from the Asbestos Register/Management Plan for the site. These should be requested from the premises duty holder, as this documentation may contain useful information about the nature and location of any asbestos that may be present on the site on and/or within the ground. Such documentation may be available on operating industrial sites, for example, as a result of previous asbestos surveys, ground investigations or even previous desk studies. Any Health & Safety Files for previous construction and demolition may also contain useful information. In most cases, however, especially on derelict or vacant land, it is the experience of AGS members that Asbestos Registers/Management Plans are unlikely to be available since these are seldom extended to land surrounding the buildings on any particular site.

Any work which potentially disturb asbestos will be NLW as a minimum as defined in CAR 2012. Sampling and asbestos laboratory analysis should be undertaken to confirm the precise ground conditions. This can provide site specific information for updating the asbestos Risk Assessment and Plan of Work, for informing and developing future risk assessments, Pre-construction Information and for the Health & Safety File.

## 6.2 Site specific asbestos risk assessment

Whenever ground investigation work is to be undertaken, the potential risks to human health from asbestos should be assessed, in relation to those who may be involved directly or indirectly. Works should also be designed so as to minimise the spread of asbestos on site, e.g. from contaminated areas to uncontaminated areas, and off site into the environment. The principal legal drivers for this are the Health and Safety at Work etc. Act 1974, CAR 2012 and the Construction (Design and Management) Regulations 2015.

For all work with asbestos, or where asbestos is potentially present, an asbestos Risk Assessment (CAR 2012 Regulation 6) and Plan of Work (Method Statement) (CAR 2012 Regulation 7) must be prepared and issued by a competent person (CAR 2012 Regulation 10).



This should include an estimate of the level of likely exposure to respirable asbestos fibres before and after control measures have been applied, confirmation of the Work Category, Emergency Procedures and details of how the work activity could disturb asbestos and the measures proposed to prevent or keep release and spread of asbestos to a minimum. If the desk study provides sufficient details of suspected or known asbestos, the CAR-SOIL guidance and DST, aid decision making on the Work Category. This, together with the Receptor Risk Ranking DST, can be used to assist in compiling a suitable safe system of work (Plan of Work).

CAR-SOIL and the Work Category DST present flow charts to explain NLW and>NNLW. [see also Section 6.7 of this document].

Ground investigations that are designated Licensed Works (LW) can only be carried out with the specialist input of a Licensed Asbestos Removal Contractor (LARC).

Where it has been established that work is not LW, CAR 2012 Regulation 3(2) sets out three specific questions in respect of deciding if NLW is exempt from having to comply with Regulations 9 (notification), 18(1)(a) (designating the work site as an Asbestos Area) and 22 (medical examinations and keeping of health records). These questions are:

- Condition 1 – is the exposure to asbestos of employees sporadic and of low intensity (SALI); **and**
- Condition 2 - is it clear the risk assessment that the exposure to asbestos of any employee will not exceed the Control Limit; **and**
- Condition 3 – does the work fall into one of the following categories:
  - Short, non-continuous maintenance activities in which only non-friable materials are handled.
  - removal without deterioration of non-degraded materials in which the asbestos fibres are firmly linked in a matrix.
  - encapsulation or sealing of ACMs in good condition.
  - air monitoring and control and collecting and analysing samples to establish whether a specific material contains asbestos.

If the answer to all of these three Conditions is “yes”, the work with asbestos will be NLW, otherwise it will be>NNLW.

Emergency Procedures to manage exposure to, or uncontrolled release of, unexpected asbestos in the event of ‘materially different conditions’ arising, or in the event of an accident, incident or ‘emergency’ need to be set up.

To prevent inadvertent and/or uncontrolled exposure to respirable asbestos fibres, information about the presence of asbestos/ACMs must be provided to anyone who could potentially disturb it/them. The results of previous ground investigations, therefore, can provide key pre-construction information for future intrusive works, excavation and construction activities where appropriate soil description and testing has been adopted. This needs to be assessed, however. For instance, is the information old, pre-dating current awareness of asbestos risks; was it prepared by suitably trained and competent persons?

### 6.3 Dynamic asbestos risk assessment

The purpose of a ground investigation is to explore the ground and determine previously unknown or refine an understanding of the ground conditions. It is often found that the nature of Made Ground is not as exactly as might have been expected from the desk study information and CSM. The objective of undertaking dynamic risk assessment is to continuously assess the potential hazards present, the risks that these may pose and consequently to verify that the planned and available control measures set out in the Plan of Work sufficiently mitigate the potential risk of asbestos disturbance and exposure of personnel. This may then be used to determine any requirement to implement additional or

supplementary contingency controls, or to determine whether there is a need to safely terminate the works. If, at any stage of a ground investigation, the conditions are not as expected and/or an unexpected situation arises during the investigation, or if the planned controls are not working adequately, the site-specific asbestos Risk Assessment should be immediately reviewed by the designated competent member of the site team, calling on any remote technical support and advice as necessary.

A dynamic asbestos Risk Assessment process is essential to check that the control measures in place, training, supervision, insurances, etc. are suitable for the actual asbestos hazards, potential exposure risks given the ground conditions encountered on site.

### 6.4 Asbestos coatings, asbestos insulation and AIB

Regulation 2 of CAR 2012 requires that work, other than asbestos sampling activities, with asbestos coatings is always LW and work with insulation and insulating board is LW if the work is not sporadic and of low intensity, the control limit will be exceeded and it is not 'Short Duration Work' (see Section 6.5). This is because it is relatively easy to release high levels of asbestos fibres when working with these materials.

If it is possible for a trained and competent person to identify suspected asbestos coatings, insulation or AIB in the field based on contextual indicators, then these materials must be described as 'clearly identifiable original form' asbestos coatings, asbestos insulation, or AIB. If, as is likely to be the case for ground investigations, it is not possible for a trained and competent person to identify these materials as asbestos coatings, asbestos insulation, or AIB, perhaps due to the lack of contextual indicators, or due to the size of fragments or the poor or badly deteriorated condition of the materials encountered during sampling, then the alternative descriptors of "loose fibrous material (asbestos)" or "unspecified fibrous (asbestos) board" may be used.

### 6.5 Short duration work

Short Duration Work is defined in CAR 2012 as work where exposure is SALI and the Control Limit is not exceeded and where the total time spent by two workers working with asbestos insulation or AIB does not exceed two hours in a seven-day period, including time spent setting up, cleaning and clearing up, and no one person works for more than one hour in a seven-day period. This could apply, for example, to excavation and disposal off-site of small volumes of insulation or insulating board found in an exploratory hole.

Note that the Short Duration Work criteria apply to the entire work activity during a ground investigation, not, for example one of a number of exploratory holes taken in isolation.

### 6.6 Level of likely exposure to asbestos fibres

The asbestos Risk Assessment must state the estimate of the level of likely exposure to respirable asbestos fibres (CAR 2012 Regulation 6). 'Exposure' is a function of airborne respirable fibre concentration and time exposed.

Note that the risk of fibre release into the air is increased if the asbestos is present in the form of friable materials or loose fibres. Laboratory studies have shown that significant concentrations of respirable fibres can be released from loose dry sandy soil with asbestos, even where concentrations in soils are as low as 0.001% by weight.

**See Figure 9.4 in CIRIA C733 and RIVM Report (2003) ) and HSG248 (2021) Paragraph 7.21 and 7.22 to help with this part of the risk assessment.**

### 6.7 Ground investigation scenarios

The main risk assessment scenarios for site walkovers and intrusive ground investigation works, and key control measures, are set out in Table 1. A robust desk study and CSM must be in place before referring to this table.

#### SAFETY MOMENT

The following activities enhance the potential for exposure to airborne asbestos during ground investigations within Made Ground where asbestos is present (depending on the extent, location, concentration, form and condition of ACM, how it is bound, how moist the ground is etc.):

- Sampling by hand
- Hand excavation
- Close logging
- Certain in situ tests and preparation
- Allowing spoil heaps and work equipment / work clothes to dry out
- Potentially use of vacuum extraction.

Where unforeseen circumstances occur (including encountering suspected ACM) the arrangements detailed in Table 1, will allow that work to be re-assessed, made safe or continued using additional controls (including specialist personnel and contractors) if required.

**Table 1: Likely asbestos Work Categories and training requirements for site walkovers and intrusive site investigations**

Scenario	Asbestos Work Category	CAR 2012 Procedure Requirements	Safeguards: Basic controls	Safeguards: DCU	Safeguards: RPE	Safeguards: Air Sampling	AA Training	NLW Training
<b>1 Greenfield</b> (no identified or highly unlikely asbestos source). <i>For farm landfills, tracks, gateways, infilled ponds which may contain uncontrolled made ground see Scenario 3, 4 or 5.</i>	Work unlikely to disturb asbestos. Not Work with Asbestos.	Asbestos Response / Emergency Procedures included in Plan of Work and RAMS to detail what to do in the event of disturbing suspected asbestos.	Standard site PPE. RAMS. Water, rags, wet wipes	Not required.	Available for staff on site, but not routinely worn.	Not required.	Required for all staff.	Not required.
<b>2 Quality Controlled Engineered Fill</b> present (evidence of not containing asbestos from laboratory testing, recycled aggregate test certificates, quality control procedures).	Work unlikely to disturb asbestos. Not Work with Asbestos.	Asbestos Response / Emergency Procedures included in Plan of Work and RAMS to detail what to do in the event of disturbing suspected asbestos.	Standard site PPE. RAMS. Water, rags, wet wipes	Not required.	Available for staff on site, but not routinely worn	Not required.	Required for all staff.	Not required.
<b>3 Uncontrolled Made Ground</b> present (asbestos likely to be present but no disturbance e.g. site walkover only and asbestos is unlikely to be present on the surface).	Work unlikely to disturb asbestos. Not Work with Asbestos.	Asbestos Response / Emergency Procedures included in Plan of Work and RAMS to detail what to do in the event of disturbing suspected asbestos.	Standard site PPE. RAMS. Water, rags, wet wipes	Not required.	Available for staff on site, but not routinely worn.	Not required.	Required for all staff.	Not required.
<b>4 Uncontrolled Made Ground</b> present (asbestos likely to be present and disturbance likely e.g. during site walkover where asbestos is likely to be on the surface. Intrusive ground investigation. Sampling for asbestos).  SALI and Control Limit not exceeded.  E.g. Some visible debris of insulating board <sup>1</sup> at surface and free dispersed asbestos fibres / bundles in Made Ground.	Work with Asbestos. NLW for site walkover. If visible identifiable suspected ACMs are present, avoid disturbance during walkover, except for the purposes of taking samples of suspect materials for laboratory asbestos identification analysis. NLW for sampling suspected asbestos during ground investigation.  <i>If ground investigation does not include sampling suspected asbestos, may require Notification of project to appropriate enforcing authority as NNLW.</i>	Asbestos Risk Assessment and Plan of Work. Asbestos Emergency Procedures. Designated Asbestos Work Area.  If NNLW, submit ASBNNLW1 prior to work commencing and after Risk Assessment and Plan of Work finalised. Designated signed and fenced Asbestos Work Area with controlled access and egress. Staff asbestos medicals beforehand (in the last 3 years).	Standard site PPE. RAMS. Minimise disturbance and spread of asbestos. Personal decontamination equipment.	Consider DCU based on anticipated asbestos concentration and site conditions.	Consider based on anticipated asbestos concentration and site conditions.	Consider based on experience of similar work, asbestos concentrations in ground and site conditions. Consider personal monitor, local to excavator / drilling rig and site boundary down-wind.	Required for all staff.	Required for all staff working with asbestos or suspected asbestos and supervisors / managers.
<b>5 Significant friable or Licensable asbestos<sup>1</sup></b> expected (e.g. buried bagged asbestos landfill).	For site walkover, no disturbance. Not Work with Asbestos.	Licensed Asbestos Removal Contractor (LARC) who is familiar with CAR-SOIL to be appointed to	LW: PPE, RPE, RAMS and Emergency	LW: Facilities for changing and washing. Consider DCU	LW: Yes – to be worn during works.	LW: Consider based on experience of similar work,	Required for all staff.	Required for all staff working with asbestos or



**Table 1: Likely asbestos Work Categories and training requirements for site walkovers and intrusive site investigations**

Scenario	Asbestos Work Category	CAR 2012 Procedure Requirements	Safeguards: Basic controls	Safeguards: DCU	Safeguards: RPE	Safeguards: Air Sampling	AA Training	NLW Training
<p>For friable and/or Licensable asbestos, or any other material where SALI limit or Control Limit could be exceeded during intrusive works.</p> <p>E.g. Closed landfill with bags of asbestos waste. Clay capping layer intact with no ACM at surface of site. Intrusive Ground Investigation Works. Sampling for asbestos.</p>	<p>For ground investigation, disturbance expected.</p> <p>Work with Asbestos.</p> <p>Ground investigation (including asbestos sampling operations) will be LW if asbestos coatings, insulation or AIB anticipated (licensable asbestos) where for insulation or AIB the work is not Short Duration Work (defined by whole job, not per GI location).</p> <p>LW for any other asbestos material if disturbance likely to exceed the Control Limit or work not SALI.</p> <p>NLW for any other asbestos material if disturbance unlikely to exceed the Control Limit or work not SALI.</p> <p><i>Note that if actual knowledge of likely asbestos air monitoring data from similar ground conditions and ground investigation work shows SALI and &lt;Control Limit, this ground investigation example could be NLW provided it is undertaken by trained and competent staff with the correct equipment for providing a safe system of work.</i></p>	<p>assist planning and controlling the work if LW.</p> <p>LARC to develop unified Risk Assessment and Plan of Work, supervise and apply appropriate control measures.</p> <p>Asbestos Emergency Procedures.</p> <p>LARC to notify works 14 days in advance using form ASB5.</p> <p>Designated asbestos Respirator Zone.</p> <p><b>If NLW, process as for Scenario 4.</b></p>	<p>Procedures requirements provided by LARC.</p> <p>Minimise disturbance and spread of asbestos.</p> <p>Fenced, signed asbestos work area.</p> <p><b>If NLW, process as for Scenario 4.</b></p>	<p>based on anticipated asbestos concentration and site conditions.</p> <p><b>If NLW, process as for Scenario 4.</b></p>	<p><b>If NLW, process as for Scenario 4.</b></p>	<p>asbestos concentrations in ground and site conditions. Consider personal monitor, local to excavator / drilling rig and site boundary down-wind.</p> <p><b>If NLW, process as for Scenario 4.</b></p>		<p>suspected asbestos and supervisors / managers.</p> <p>Further procedures and licenses for Licensed Work area to be confirmed by LARC.</p>

Note 1) Licensable asbestos is clearly identifiable original-form' coating, insulation and insulating board as per CAR 2012 Regulation 2. Note concession in CAR-SOIL may apply where if significant degradation has occurred in the ground, then it may not be a recognisable licensable material under Regulation 2. For example, on visual inspection by a trained and competent person, it is not possible to identify materials as coatings, insulation or insulating board from field contextual evidence, e.g. very small, deteriorated fragments.

**Table 2: Example activity and likely Work Category**

	<b>Likely Work Category for trained and competent staff with right equipment</b>	<b>Activity</b>
<b>1</b>	<p>Desk study reveals previous GI undertaken, considered suitable and sufficient as per CAR-SOIL.</p> <p>Previous ground investigation report confirms occasional fragments of asbestos cement found in several boreholes/trial pits.</p> <p>Site walkover survey reveals no fragments of ACMs across the surface of the site.</p> <p><b>Trace quantity. CAR 2012 does not apply.</b></p>	<p>Supplementary ground investigation for detailed geotechnical design purposes.</p> <p>Ground investigation confirms occasional fragments of asbestos cement and laboratory analysis confirms several samples with dispersed fibre bundles &lt;0.001% w/w.</p>
<b>2</b>	<p>Desk study reveals no previous GI undertaken and site walkover survey reveals only several random/occasional fragments of insulating board (suspected AIB) AIB and loose fibrous asbestos on surface of the site.</p> <p>No laboratory analysis on soil samples previously undertaken.</p> <p>Desk study confirms that very unlikely that AIB or asbestos insulation will be widespread.</p> <p><b>Trace quantity. CAR 2012 does not apply.</b></p>	<p>Ground investigation for geotechnical design purposes, without sampling of materials for asbestos analysis.</p> <p>No fragments of AIB or loose fibrous asbestos visually confirmed in any boreholes.</p>
<b>3A</b>	<p>Desk study and site walkover survey reveals more than several random/occasional fragments of AIB across the surface of the site.</p> <p>No laboratory analysis on soil samples previously undertaken. Desk study confirms that AIB is likely to be widespread.</p> <p>Project duration 1-5 days (not Short Duration Work).</p> <p><b>Drilling (asbestos sampling or no asbestos sampling) LW. Bagging up and removal LW.</b></p> <p>Note: As surplus arisings would need to be double bagged and disposed of off-site as Hazardous Waste as an integral part of the GI, all GI operations are classed as LW, including drilling.</p>	<p>Ground investigation for geotechnical design purposes, with or without sampling of materials for asbestos analysis.</p> <p>Multiple fragments of AIB found in one or more boreholes.</p> <p>Samples taken for analysis of asbestos. Surplus arisings and excess AIB debris bagged up as hazardous waste at each location, work takes more than one hour in a 7-day period for each of two workers.</p> <p>SALI and &lt;Control Limit.</p>
<b>3B</b>	<p>Desk study and site walkover survey reveals moderate occurrence fragments of AIB across the surface of the site.</p> <p>No laboratory analysis on soil samples previously undertaken. Desk study confirms that suspected loose fibrous asbestos likely to be sporadic and randomly distributed across the site.</p> <p><b>Drilling (no asbestos sampling) NNLW. Bagging up and removal NNLW.</b></p> <p>Note: As for 3A, surplus arisings would need to be double bagged and disposed of off-site as Hazardous Waste as an integral part of the GI, all GI operations are classed as NNLW, including drilling, on account that the GI operations are likely to cause some deterioration of the asbestos (which is not clearly identifiable original form asbestos insulation).</p>	<p>Ground investigation for geotechnical design purposes, without sampling of materials for asbestos analysis.</p> <p>Multiple occurrences of suspected loose fibrous asbestos scattered across the site surface at multiple borehole locations, suspected presence at depth.</p> <p>Samples not taken for analysis of asbestos. Surplus arisings and excess AIB debris bagged up as hazardous waste at each location, work takes more than one hour in a 7-day period for each of two workers.</p> <p>SALI and &lt;Control Limit.</p>
<b>4</b>	<p>Desk study and site walkover survey reveals only more than several random/occasional fragments of AIB across the surface of the site.</p> <p>No laboratory analysis on soil samples previously undertaken. Desk study confirms that AIB is likely to be widespread.</p> <p>Project duration 1-5 days.</p> <p><b>Trial Pitting and sampling NLW.</b></p>	<p>Ground investigation for geoenvironmental purposes, with sampling of materials for asbestos analysis.</p> <p>Ten trial pits, total fieldwork taking 2 days.</p> <p>Made Ground five metres thickness containing recognisable fragments of AIB throughout.</p> <p>Samples taken of AIB fragments and other Made Ground for asbestos analysis.</p> <p>All Made Ground excavated returned into trial pits.</p> <p>SALI and &lt;Control Limit.</p>

**Table 2: Example activity and likely Work Category**

	<b>Likely Work Category for trained and competent staff with right equipment</b>	<b>Activity</b>
<b>5</b>	<p>Desk study and site walkover survey reveals no fragments of ACMs across the surface of the site.</p> <p>No laboratory analysis on soil samples previously undertaken. Desk study confirms that asbestos/ACMs likely to be present across the site at depth.</p> <p>Project duration 1-5 days.</p> <p><b>Drilling and sampling NLW. Bagging up and removal NLW.</b></p> <p>Note: All surplus arisings would need to be double bagged and sent for disposal of off-site as Hazardous Waste.</p>	<p>Ground investigation for geoenvironmental purposes, with sampling of materials for asbestos analysis.</p> <p>Standpipes installed in boreholes for groundwater or ground gas monitoring and therefore surplus arisings required to be sent for disposal off-site.</p> <p>ACMs and/or fibre bundles not visible to naked eye at time of drilling boreholes.</p> <p>Surplus arisings stockpiled and quarantined pending analytical results.</p> <p>Laboratory analysis of Made Ground shows up to 1% by weight degraded free asbestos fibres in several boreholes.</p> <p>SALI and &lt;Control Limit.</p>
<b>6</b>	<p>Desk study and site walkover survey reveals no asbestos or fragments of ACMs across the surface of the site.</p> <p>No laboratory analysis on soil samples previously undertaken.</p> <p>Desk study confirms that site is a hazardous waste landfill with a high likelihood that red United Nations approved bags of asbestos insulation will be encountered at depth.</p> <p>Project duration 1-5 days.</p> <p><b>Drilling and sampling LW. Bagging up and removal LW.</b></p>	<p>Ground investigation for geoenvironmental purposes, with sampling of materials for asbestos analysis.</p> <p>Standpipes installed in boreholes for groundwater or ground gas monitoring and therefore surplus arisings required to be sent for disposal off-site.</p> <p>Insulation is automatically licensable material if not Short Duration Work.</p> <p>SALI and &lt;Control Limit.</p>
<b>7</b>	<p>Desk study reveals no significant likelihood of asbestos being present on site.</p> <p>No laboratory analysis on soil samples previously undertaken.</p> <p><b>Walkover NLW.</b></p>	<p>Site walkover of field adjacent to an industrial installation.</p> <p>Walkover completed by 1 person in &lt;1 hour or 2 persons in &lt;2 hours.</p> <p>Several fragments of AIB debris visually identified at surface. Limited scope bulk sampling of suspected materials for confirmatory asbestos identification analysis.</p> <p>SALI and &lt;Control Limit.</p>
<b>8</b>	<p>Desk study reveals significant likelihood of asbestos being present on site.</p> <p>No laboratory analysis on soil samples previously undertaken.</p> <p><b>Walkover NLW.</b></p>	<p>Site walkover of large open derelict former industrial installation.</p> <p>Walkover completed by 1 person in &gt;1 hour or 2 persons in &gt;2 hours.</p> <p>Significant AIB fragments/debris at surface across whole site. Limited scope bulk sampling of suspected materials for confirmatory asbestos identification analysis.</p> <p>SALI and &lt;Control Limit.</p>

## 7.0 Plan of Work (Method Statement)

The Plan of Work (Method Statement) is a requirement of CAR 2012 Regulation 7, covering how work with asbestos will be carried out. For ground investigations where the regulations do not apply, then a comparable health and safety plan or construction phase plan should be prepared which should include provisions for trace asbestos to be present in the soil. The control measures which need to be set out in the Plan of Work are aimed at preventing or, where this is not practicable, minimising the release of asbestos fibres into the air and the spread of asbestos dust/debris. The asbestos exposure risk depends not just upon the type of soil and material revealed, but also upon the weather conditions as they vary.

The following principles are required to comply with CAR 2012 to prevent/minimise exposure and the spread of asbestos during ground investigations:

- Limit the number of staff on site to those who are essential for completing the works in hand.
- Ensure all staff involved (including operatives) are suitably trained, qualified and competent and have been briefed in advance on the Risk Assessment and Plan of Work and have received specific training in the correct use of equipment and implementation of control measures, including personal decontamination procedures.
- Review Risk Assessment and ensure still valid for prevailing site conditions.
- Check equipment list and ensure all required materials/equipment available as per Plan of Work.
- Define 'clean zones' for access and transit routes to and from the working area(s).
- Set up decontamination station in clean zone using equipment and facilities as per the Plan of Work, preferably close to access point to the work area.
- Define/designate working area(s). NLW, NNLW and LW require some form of demarcation or a barrier and asbestos warning signage as appropriate [see *Section 7.1*].
- Restrict access to the working area(s) only to those required to work in the area(s). Don correct RPE and PPE suitable for the type and duration of work with asbestos as per Plan of Work.
- Conduct work as per Plan of Work.
- Staff to remain up-wind of excavation works and dust generating activities where possible.
- Use of appropriate dust suppression methods, where required, to prevent dust generation which may lead to the spread of asbestos.
- Minimise handling and double handling of arisings to a minimum, i.e. reduce disturbance of ACMs as far as possible.
- Dampen down excavations, stockpiles and arisings as and when needed to reduce airborne dust. Cover stockpiles if storing stockpiles and arisings suspected to contain or containing ACMs.
- Return arisings to the exploratory hole where possible or, alternatively bag up surplus asbestos-contaminated arisings to minimise fibre release and exposure to asbestos for disposal off-site as asbestos waste, ensure no visible ACMs remain on surface on completion of each exploratory hole.
- On completion of shift/work, transit to clean zone decontamination station, clean equipment, wash boots, safely remove other PPE, lastly RPE.
- Contaminated materials to be placed in asbestos waste bags, sealed with duct tape.
- Demobilise, leave site clean and tidy.

### 7.1 Designated areas

CAR 2012 Regulation 18 requires employers to make sure that areas where NNLW and LW asbestos work is being carried out are designated as an Asbestos Area or a Respirator Zone respectively and signed appropriately.



All signage must comply with the Health and Safety (Safety Signs and Signals) Regulations 1996 regarding size, colour and design. The following signage is recommended:

- Prohibition sign – authorised personnel only
- Warning sign - Asbestos Area

and, for licensable work where RPE must be worn:

- Mandatory sign – Respirator Zone



No access for unauthorised persons



General danger



Respiratory equipment must be worn

All areas where asbestos works are carried out, including NLW, NNLW and LW must be separated, clearly marked, and restricted to those required to work in the area. All asbestos work areas are to be physically demarcated and signed as such and access controlled. The types of suitable barriers will depend on the site location, remoteness and other activities and could be a taped/roped off area, Heras fencing, or hoarding.

## 7.2 Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE)

RPE is the last line of defence against exposure to asbestos fibres. Where exposure to asbestos fibres cannot be prevented, or exposures cannot be reduced to level that is considered to be as low as reasonably practicable (ALARP) by other means, e.g. appropriate safe working methods or control measures, RPE must be provided by the Employer and worn by employees. A range of other appropriate PPE may be required. It is the responsibility of Employers to ensure the correct procedures are in place and the correct PPE and RPE is provided and worn as appropriate.

For NLW, whether RPE will be required to be worn depends on the types of work being undertaken, the asbestos Risk Assessment, the Plan of Work and whether or not the safe working practices and control measures that will be applied will be capable of ensuring that respirable asbestos fibres will not be disturbed into the air.

The HSE specify the following adequate PPE and RPE for specific protection against asbestos contamination and inhalation. Selection should be determined by other contaminants present also. These should be provided by Employers and selected based on the work conditions being undertaken and personal needs of staff:

- Type 5 (BS EN ISO 13982-1+A1) disposable coverall with hood.
- Disposable gloves.
- Safety boots without laces e.g. wellingtons or safety footwear that can be easily cleaned.
- Disposable respirators to standard EN149 (Type FFP3) or EN1827 (Type FMP3).
- Half Mask Respirators to standard EN140 with P3 filter(s).
- Full face mask respirator to standard BS EN 136 with P3 filter(s).
- Full face mask powered respirator to standard BS EN 12942 with P3 filter(s) (Type TM3).

A risk assessment should be undertaken to determine the most appropriate RPE for the activities being undertaken, bearing in mind the location, duration, weather, potential for trips or falls due to uneven ground, as well as the presence of other hazards, etc.

All ground investigation staff provided with RPE must be face-fit tested by a competent person for the make and model of RPE in use and supplied with the RPE (make, model and facepiece size) for which they have been face-fit tested. Guidance on face-fit testing can be found at: <https://www.hse.gov.uk/pubns/indg479.htm>.

Anybody responsible for selecting, issuing, using, or maintaining RPE should be competent and should be able to demonstrate this by reference to records of appropriate training. Staff must be trained and competent in the use, inspection, fault-finding, fit checking and, for reusable RPE, maintenance and record keeping for the selected RPE. See HSE guidance document HSG53 'Respiratory protective equipment at work: A practical guide' (4<sup>th</sup> edition, 2013) for more details.

All disposable clothing and equipment potentially contaminated with asbestos, including mask filters and plant filters, should be disposed of as hazardous asbestos waste.

### 7.3 Personal decontamination and use of decontamination facilities

All staff must ensure dirt and dust potentially containing asbestos is not tracked into vehicles, welfare facilities, site cabins, taken home etc where it could dry out, become airborne and potentially be inhaled. Poor decontamination could result in secondary exposures to colleagues, family, and friends. As a minimum, a simple personal decontamination station outdoors for all NLW and NNLW should be set up in a 'clean zone' prior to site work commencing.

#### KEY STEPS

##### Simple personal decontamination procedure

- Clean boots in a large wide bucket containing clean water with stiff wire or bristle brush and wipe with damp rags or rinse with clean water and store in dedicated bag or box.
- Disposable coveralls and gloves should be carefully peeled off and be inside out when they have been removed. They should then be placed in a suitable asbestos waste bag if suspected of having been contaminated with asbestos. *Note that reusable overalls should not be used for asbestos work unless worn under a disposable coverall.*
- If reusable coveralls become partially contaminated with suspected asbestos fibres, first clean with damp rags in a gentle patting action in accordance with EM7 (HSE, 2017 -<https://www.hse.gov.uk/pubns/guidance/em7.pdf>), carefully remove these as above and place in a suitable bag for cleaning at a specialist laundry. Any heavily contaminated clothing should be treated and disposed of as above.
- Finally, remove respiratory protective equipment after first cleaning around the facepiece seal and exposed skin with a damp cloth or wet wipe in accordance with EM6 (HSE, 2017 -<https://www.hse.gov.uk/pubns/guidance/em6.pdf>) and place in clean storage box (if reusable) or dispose of as asbestos waste (if disposable, at the end of the day/shift).
- Dispose of contaminated water to ground and contaminated brushes, cloths/rags as hazardous asbestos waste.

Facilities for changing and cleaning such as a purpose-built mobile decontamination unit (DCU) must be provided for LW but use for NLW and NNLW will depend on the risk assessment. It should be noted that personnel required to use a mobile DCU require specific additional training in its use. If use of a DCU is required prior to exiting an asbestos work area, normal 'street' clothes cannot be worn under disposable coveralls. Alternative disposable clothing should be worn, e.g. sacrificial undergarments (as used by LARCs on removal jobs, or semi-disposable thermals. The reason for this is simple; when you enter the 'dirty' end of a DCU, this area is treated as being contaminated with asbestos. Coveralls and undergarments are removed and placed in the asbestos waste bag. When all clothing is removed, the individual moves to the shower cubicle wearing only their RPE. If 'street' clothes are worn, once coveralls are removed, there is no guarantee that they are not contaminated with asbestos. So, logically, they must be disposed of as asbestos waste as well.

If a DCU has to be used in an 'emergency' situation, the appropriate response procedures should be set out in the Plan of Work.

Further information of cleaning of plant and equipment is provided in CAR-SOIL Section 11.6.

### 7.4 Emergency Procedures

If unexpected contamination (including asbestos) is uncovered during ground investigation works that was not planned for and expected, or 'conditions arise that are not as per the Risk Assessment – materially different conditions' – work must stop and the emergency procedures put into action.

With respect to asbestos, CAR 2012 requires that in the event of an accident, incident or emergency related to the uncontrolled release of asbestos an employer must, amongst other things, take immediate steps to:

1. warn people who may be affected.
2. exclude people from the area, who are not needed to deal with the release.
3. identify the cause of the uncontrolled release.
4. regain adequate control as soon as possible.

The information presented in the HSE asbestos essentials guidance EM1, HSE, 2018 is useful for emergency planning and can be found here: <http://www.hse.gov.uk/pubns/guidance/em1.pdf>

### 7.5 Medicals

Regulation 22(3) of CAR 2012 places duties on employers to maintain health records for employees who carry out 'notifiable' work with asbestos and to ensure they receive statutory medical surveillance as outlined below. Medical records are not required for work with asbestos that is not Notifiable (i.e. NLW does not require medical records).

#### 7.5.1 Notifiable Non-Licensed Work (NNLW)

Medical surveillance should consist of initial and periodic medical examinations. The first medical examination must be conducted no more than three years before beginning of exposure to asbestos and repeated at 3-year intervals while NNLW working continues.

Further details are provided in MS34 (HSE, 2018 <http://www.hse.gov.uk/pubns/ms34.pdf>). Exposure records and health records must be maintained anyone carrying out NNLW, records must be kept by the employer for a minimum of 40 years (CAR 2012 ACOP).

#### 7.5.2 Licensable Work (LW)

The details for medicals for Licensable Work employees are included in Medical Guidance Note MS31.

## 8.0 Notification and Licensing

If it is established at desk study stage that asbestos in the ground, if present, is not or is unlikely to be above 'Trace' levels, CAR 2012 does not apply.

If it is established at desk study stage that asbestos is reasonably foreseeable to be present in the ground above 'Trace' levels, i.e. uncontrolled Made Ground is or could be present, CAR 2012 should be applied and ground investigation works will generally be NLW. Guidance on Notification and Licensing categories are provided in CAR 2012 Regulation 9, CAR-SOIL, and the Work Category DST.

Note, for example, that a solely geotechnical intrusive ground investigation, which does not involve the 'sampling of soils to determine the presence of asbestos', will not benefit from the exemptions provided by CAR 2012 Regulation 3(2) Condition 3 for NLW, and as such will require notification to the Regulator as NNLW. Therefore, it may be prudent to always include sampling of suspected asbestos by personnel that are trained and competent for all ground investigations.

At some exceptional contaminated land sites, ground investigations, where soil sampling for the presence of asbestos is carried out, may need to be considered as LW, due to the expected concentration of fibres in air being likely to approach or exceed the Control Limit or STEL, irrespective of the asbestos material type and/or

whether it is in 'original form'. In these circumstances, a ground investigation would need to be carried out under a Risk Assessment and Plan of Work developed jointly with a LARC who would be responsible for notifying the works to the HSE at least 14 days in advance of the work commencing. In such cases, the ground investigation would be conducted under the supervision of the LARC, who would be responsible for the production and implementation of a unified Plan of Work and the application of appropriate safe working methods and controls.

## 9.0 Training

### 9.1 Asbestos Awareness

CAR 2012 Regulation 10 sets out mandatory training requirements. All staff who could foreseeably encounter or accidentally disturb asbestos during the works, as well as their supervisors and managers, must have basic Asbestos Awareness Training (AAT). AAT is designed to inform people of the history and dangers of asbestos, where it might be found and to identify potential ACMs. They are then in a position where they can immediately stop the work when suspected asbestos is encountered, so the soil is not disturbed further. The AAT for ground investigation should include a module specifically relating to asbestos in Made Ground. Periodic on-going Asbestos Awareness refresher training such as a toolbox talk on asbestos or discussion of a case study is required.

All training should be given or prepared by people who are considered by the Employer as being competent to do so and who have personal practical experience and a theoretical knowledge of all relevant aspects of the work being carried out.

**AAT is not enough on its own to allow individuals to prepare an asbestos risk assessment or if any work with asbestos or suspected asbestos is planned, i.e. carrying out an intrusive ground investigation in Made Ground where asbestos is suspected to be present and is likely to be disturbed. Additional training is then required, as detailed below.**

### 9.2 Additional Training

It is a legal requirement that anyone who will be expected to plan, carry out or supervise ground investigation work and sampling of ground which could contain asbestos liable to be disturbed must have higher level "additional training" beyond AAT. For ground investigations, this must be a training course for NLW for asbestos which is tailored to ground investigation activities. The NLW course should be based on 'Training Needs Analysis' and tailored to ground investigations and ground works in order for the relevant information to be given on our ground-based tasks, rather than standard training about working with asbestos in buildings.

Refresher training including for NLW, NNLW and LW is required at least annually, with the content based on a Training Needs Analysis (TNA). For example, a toolbox talk or discussion of a case study would be sufficient for experienced staff who undertake such work daily. However, for staff who are only sporadically involved in work with asbestos, classroom-based or practical training may be required. Where training needs dictate, refresher training should include an appropriate element of practical training, particularly covering decontamination procedures, use of RPE and Face-Fit Testing.

## 10.0 Insurance

AGS members likely to be involved in activities likely to disturb asbestos and / or to carry out ground investigations etc. that may encounter or sample soils containing asbestos, should ensure that appropriate insurance is in place and is relevant to the activity taking place. This may be specified as an additional named insured activity on the policy.



## 11.0 Sampling and Logging

### 11.1 Sampling

Representative samples of Made Ground suspected to contain asbestos and fragments of suspected ACMs in the ground are to be taken by a competent person who holds NLW training for asbestos in soil/ground works. Samples of suspected asbestos debris such as pieces of insulating board, pipe, rope etc must be double bagged into resealable small sample bags and which can then be placed into a plastic tub for onward transport to the laboratory. All samples must be clearly marked "Suspected Asbestos" and labelled using proprietary asbestos warning stickers (Figure 9.1). Suspected ACM must not be broken up.

For road transport the requirements of the Carriage of Dangerous Goods Regulations 2009 must also be complied with; the requirements for transportation of samples are dependent upon the quantity and likely type of asbestos present. Chrysotile and amphiboles have different Excepted Quantities and Limited Quantities.

Geoenvironmental and geotechnical testing laboratories and sample storage facilities (whether in-house or external) must be provided with advance written warning before samples of suspected asbestos are dispatched from the sampling site.

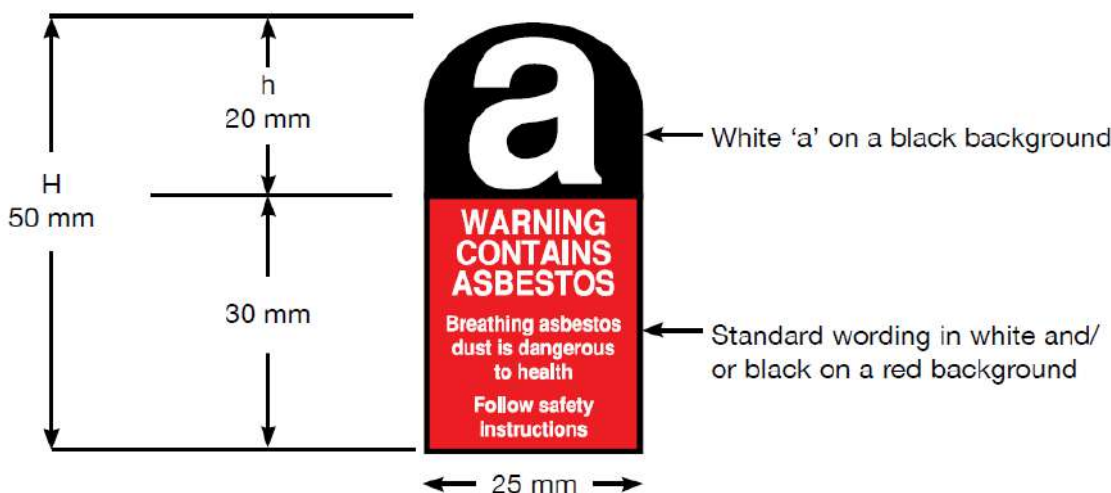
Use the AGS4 sample type (SAMP\_TYPE) code "ES" for soil samples for geoenvironmental testing. It is useful to include in a site investigation Specification a SAMP\_TYPE "ACM" for debris of suspected asbestos separately sampled for geoenvironmental testing. This will be easy to distinguish for scheduling of "asbestos screen and ID of bulk samples".

Any Made Ground samples suspected to contain asbestos are to be submitted for "asbestos screen and ID" at a UKAS accredited laboratory [accredited to ISO/IEC 17025 for the identification of asbestos and ACMs in soils in accordance with a method based on the one outlined in HSG 248].

Once a positive identification is made, the sample may require further testing for asbestos quantification in accordance with a method based on the one outlined in the Environment Agency SCA Blue Book for the quantification of asbestos in soils and associated materials. Note that quantification is not undertaken on recognisable fragments of ACM submitted for ID alone. Quantification is an additional UKAS accreditation, so the laboratory should be suitably accredited to do this analysis also.

Quantification is conducted on Made Ground samples that may contain ACM fragments and dispersed fibre bundles; literature values are used to estimate the percent asbestos in fragments of ACM.

Figure 9.1: Asbestos warning label reproduced from L143





### 11.2 Logging of Made Ground containing asbestos

Descriptions of any Made Ground must follow the BS 5930; see Section 33.4.5 on logging anthropogenic ground.

Description of Made Ground, whether *in situ* or in sample containers at another location, should be carried out using the appropriate PPE and RPE.

Of importance to describing visible suspected ACM fragments and fibrous materials in the ground are:

- Suspected asbestos - product type (cement-bonded roof tile, rope, insulation etc)
- its condition (intact, weathered, degraded, disaggregated)
- Friability - how easily it crumbles (friable or non-friable)
- Depth and distribution in the stratum, estimate of % w/w ACM
- Where free fibres or debris of asbestos is positively identified in the laboratory by Screen and ID, this must be included in the description in the final exploratory hole log in the stratum from which the sample was taken.

### 11.3 Air monitoring

As per Regulation 19 of CAR 2012, personal sampling/air monitoring is required for persons liable to be exposed above the Control Limit for a range of jobs and work methods, to protect the health of employees and to ensure that work practices and controls are adequate. Air monitoring will also help to support future risk assessments. It should be done at regular intervals and when there is a change in conditions that could affect exposure. It is important to ensure the duration and volume of air sampled are appropriate in order to ensure that the appropriate limit of quantification is achieved (see CIRIA C733).

In some cases, personal monitoring may be needed to inform the risk assessment and POW where exposures are unknown e.g. drilling through asbestos waste cells or excavating trial pits in stockpiles of asbestos-contaminated recycled aggregate.

Air sampling and analyses for the purpose of detecting airborne asbestos must be undertaken by a UKAS accredited laboratory and in accordance with HSG 248 The Analyst's Guide and Regulation 20(3) of CAR 2012.

Reassurance or background sampling may be undertaken e.g. when asbestos is exposed on the surface or is being actively disturbed. Monitoring locations could include personal samplers on drilling rig or excavator operators, those taking/logging samples, static samplers near excavations/ stockpiles, site perimeter and upwind of site to provide baseline data. Monitoring close to the works is preferred to monitoring undertaken at the site perimeter at significant distance to where the work activity is being carried out. See CIRIA C733 for more information.

Ground investigations works are not conducted inside asbestos enclosures under fully controlled conditions. This means that spread of asbestos from the workplace during normal operations is a possibility. Therefore, work methods should be implemented to ensure that release of airborne fibres is prevented or levels are kept to a level that is as low as is reasonably practicable. Background monitoring should be conducted upwind of site prior to the commencement of the work to provide baseline data. See also HSG248 (2021).

## 12.0 Waste disposal

All disposable PPE, disposable RPE and clothing that is considered to be potentially or is actually contaminated with asbestos must be disposed of as hazardous asbestos waste.

Waste containing asbestos or ACM at quantities greater than 0.1% by weight, or where fragments of asbestos-containing material are present and visible to the naked eye of a competent person, is a hazardous waste. Further guidance on waste assessment is provided in Environment Agency WM3.

### 13.0 Laboratory management

See AGS Assessment and Control of Asbestos Risk in Soil; Part 2: Protection of personnel within geotechnical and geoenvironmental laboratories.

### 14.0 Case studies

#### 14.1 Geoenvironmental investigation of Made Ground

Risk Assessment Factor	Outcome
Proposed works to be undertaken	Six cable percussion boreholes through approximately six metres thickness of Made Ground potentially containing asbestos into underlying London Clay Formation. Standpipe installations. Geotechnical and geoenvironmental sampling and asbestos analysis. In-situ geotechnical testing.  Removal and disposal of surplus Made Ground.
Anticipated type of asbestos	Uncontrolled land raising of area from adjacent demolition works. Likely to be loose fibres and degraded cement-bonded ACM.  DST Hazard Factors: Medium
Anticipated nature and degree of exposure (Exposure Factor)	SALI and Control Limit unlikely to be exceeded. Anticipated based on previous air monitoring.  DST Exposure Factors: Low
Steps to be taken to reduce fibre release/spread as far as reasonably practicable	<ul style="list-style-type: none"> <li>• Fence off working area and erect signage.</li> <li>• Only trained and competent personnel allowed within working area (Asbestos Awareness and Non-Licensed Work training).</li> <li>• Dampen down arising materials.</li> <li>• Face-fitted RPE available for all staff.</li> <li>• Personal decontamination facilities, spraying down plant.</li> </ul>
Training	Drillers and supervisor AAT and NLW including>NNLW trained.
Actual identified contamination/concentrations	0.5m thickness band of construction and demolition waste encountered in each borehole. Laboratory analysis samples confirmed cement-bonded ACM.
Matrix of material and moisture content	Clayey Made Ground. Moisture Content 10%.
Effect of control measures	Personal monitoring results: <0.01 f/ml

CAR-SOIL Decision Support Tool: Non-Licensed Work:

Stage 3

Risk Assessment Outputs

Probable Licensing Status

RPE\*

Dust Suppression\*\*

Hygiene/Decontamination\*\*\*

Non-Licensed Work

EN149 type FFP3 disposable

Manual/localised dust suppression

Localised and basic personal decontamination facilities

\*Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary.

\*\*Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground)

\*\*\*Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis

## 14.2 Geotechnical investigation of bedrock below Hazardous Waste landfill

Risk Assessment Factor	Outcome
Proposed works to be undertaken	<p>Geotechnical ground investigation only with no sampling for suspected asbestos.</p> <p>3 rotary boreholes (water flush open hole through landfill) to prove bedrock geology. Borehole cased through landfill material.</p>
Anticipated type of asbestos	<p>Hazardous waste landfill. Potential for co-disposal of asbestos. Likely to be all types of asbestos products including coating, insulation and cement-bonded wrapped in UN-approved packaging for disposal to landfill. Random distribution on co-disposal landfill.</p> <p>Disaggregated, friable, dry, gross contamination.</p> <p>DST Hazard Factors: High</p>
Anticipated nature and degree of exposure (Exposure Factor)	<p>Discrete landfill material at 1m to 5m bgl below a clay capping layer so no contact or disturbance at surface.</p> <p>Water flush rotary drilling. Significant deterioration and disturbance of asbestos during drilling.</p> <p>Made Ground and asbestos arisings dampened down and returned into boreholes to prevent spread of material.</p> <p>Not SALI and Control Limit likely to be exceeded.</p> <p>DST Exposure Factors: High</p>
Steps to be taken to reduce fibre release/spread as far as reasonably practicable	<ul style="list-style-type: none"> <li>• Work supervised by LARC.</li> <li>• Fence off working area and erect signage including respirator zone;</li> <li>• Only trained and competent personnel allowed within working area (Drillers: Asbestos Awareness and Non-Licensed Work training, medicals completed. Supervisor LW trained and licensed);</li> <li>• Dampen down arising materials;</li> <li>• half mask with combination filter for various chemicals and asbestos, Tyvek Type 5/6 disposable suit, rubber boots, gloves</li> <li>• DCU, spraying down plant and water flush;</li> <li>• Air monitoring (reassurance &amp; personal);</li> <li>• safe removal and cleaning / disposal of PPE and RPE.</li> </ul>
Training	<p>Drillers and supervisor AAT and NLW including&gt;NNLW trained and&gt;NNLW medicals in date. Supervised by LARC LW Contractor.</p>
Actual identified contamination/concentrations	<p>One red plastic UN approved asbestos waste bag in drilling arisings from landfill material horizon of AIB. ACM likely to contain at least 10% asbestos by volume as a product, and up to 100% if free fibres present. Dry, friable.</p> <p>Landfill capping material – no asbestos found in previous sampling.</p>
Matrix of material and moisture content	<p>Inert cover layer (landfill cap)</p> <p>Loose ACM in UN-approved red bags labelled as asbestos. Friable. Likely to be low moisture.</p>
Effect of control measures	<p>Personal monitoring results: &lt;0.01 f/ml</p>



CAR-SOIL Decision Support Tool: Licensed Work:

**Stage 3**

**Risk Assessment Outputs**

Probable Licensing Status	Licensed Work
RPE*	EN136 with P3 filter full face mask
Dust Suppression**	General mechanical dust suppression
Hygiene/Decontamination***	Mobile self-contained personal decontamination facilities

\*Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary.

\*\*Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground)

\*\*\*Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis

Photograph of site set up (courtesy of S M Associates), rotary drilling rig and operatives in PPE and RPE:



### 14.3 Geoenvironmental investigation using trial pits

Risk Assessment Factor	Outcome
Proposed works to be undertaken	<p>Trial pitting below concrete slabs to investigate historical buried infill contaminated with asbestos.</p> <p>A total of 40 trial pits broken up into parcels of 3-5 to ensure works could be fully controlled. All samples scheduled for asbestos screen and quantification, accompanied by a general chemical contamination suite.</p>
Anticipated type of asbestos	<p>Based on ground investigation of surrounding area of similar land use, expected significant thickness of Made Ground with some disintegrated fibrous ACM).</p> <p>Disaggregated, friable, gross contamination.</p> <p>DST Hazard Factors: High</p>
Anticipated nature and degree of exposure (Exposure Factor)	<p>SALI and Control Limit unlikely to be exceeded - anticipated based on previous air monitoring.</p> <p>Sampling only with no removal or processing but with potential for significant deterioration of ACM.</p> <p><b>DST Exposure Factors: High</b></p>
Training and medicals	<p>AA and NLW training.</p> <p>Face fit testing.</p> <p>Personal decontamination and use of Decontamination Unit training</p>
Steps to be taken to reduce risk/ fibre release/spread as far as reasonably practicable.	<ul style="list-style-type: none"> <li>• Fence off working area and erect asbestos warning signage;</li> <li>• Only trained and competent personnel allowed within working area (Asbestos Awareness and Non-Licensed Work);</li> <li>• FFP3 filtered half mask, Type 5/6 (CAT3) coveralls, steel toe-capped wellington boots and nitrile gloves;</li> <li>• Controlled concrete breaking and excavation techniques;</li> <li>• Dampen down arising materials &amp; atomising sprayer to dampen general area;</li> <li>• Ground protection measures to prevent cross contamination;</li> <li>• Mandatory transit through basic decontamination facilities. Full decontamination facilities (DCU) available for use in emergencies. [NOTE: Although only present for emergency in this case study, all staff on site appropriately trained to use DCU, Emergency Plan in place and clothing to be disposed of if contaminated.]</li> <li>• Air monitoring (reassurance &amp; personals);</li> <li>• All arisings returned to the excavation post works and area/equipment thoroughly decontaminated; and</li> <li>• Each parcel signed off by an independent UKAS analyst post works prior to handing back to Client.</li> </ul>
Actual identified contamination/concentrations	<p>Soil contaminated with visible loose fibrous asbestos debris. Loose fibres identified within the soils from laboratory analyses.</p>
Matrix of material and moisture content	<p>Cohesive Made Ground material with a high frequency of general demolition arisings.</p> <p>High ground water level meant that Made Ground materials maintained a had a high moisture content despite the extensive concrete cover. All arisings were returned to the trial pit immediately after logging was complete to prevent drying out.</p>

Risk Assessment Factor	Outcome
	New/clean concrete capping cover reinstated post works to encapsulate area.
Effect of control measures	All air monitoring was <0.01f/ml (static tests)

**CAR-SOIL Decision Support Tool: Non-Licensed Work:**

Probable Licensing Status	Non-Licensed Work
RPE*	EN149 type FFP3 disposable
Dust Suppression**	Manual/localised dust suppression
Hygiene/Decontamination***	Localised and basic personal decontamination facilities

Photograph of site set-up (courtesy of Hydrock Consultants), signage, barriers and DCU:



### 15.0 Check List

The following prompt list is comprehensive but not exhaustive:

<input type="checkbox"/>	Robust Desk study (see BS 10175) – is asbestos likely to be present?
<input type="checkbox"/>	Assessment of asbestos work category
<input type="checkbox"/>	Insurance for work with asbestos
<input type="checkbox"/>	Risk assessment to include likely fibre concentrations in air
<input type="checkbox"/>	Plan of Work (method statement) to include control measures
<input type="checkbox"/>	Notification of work to HSE as appropriate
<input type="checkbox"/>	Emergency Procedures
<input type="checkbox"/>	Asbestos training – awareness and non-licensed work as minimum
<input type="checkbox"/>	Asbestos licence and operative training records – for LARC undertaking/assisting with licensable work
<input type="checkbox"/>	Medicals and record keeping as appropriate
<input type="checkbox"/>	Inform geotechnical and geoenvironmental testing laboratory of likelihood of asbestos in samples
<input type="checkbox"/>	Add information into exploratory hole logs where samples testing positive for asbestos
<input type="checkbox"/>	Add information of asbestos in ground to CDM Health & Safety File

## 16.0 References and Further Reading

- British Drilling Association (2008). Guidance for Safe Intrusive Activities on Contaminated or Potentially Contaminated Land
- British Drilling Association (2017). Guidance for the Operation of Cable Percussion Rigs and Equipment
- BSI (2017). BS 10175:2011 +A2:2017 Investigation of potentially contaminated sites – Code of practice
- CIRIA (2014). C733 Asbestos in soil and Made Ground: A guide to understanding and managing risks
- CIRIA (2017). C765 Asbestos in soil and Made Ground good practice site guide
- CIRIA (2014). SP168 Asbestos in soil and made ground : a guide to understanding and managing risks : ready reference
- CL:AIRE (2011). Conference - Asbestos in Soil: Developments in Legislation, Policy and Practice 1<sup>st</sup> November 2011
- CL:AIRE (2016). Control of Asbestos Regulations 2012 Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials Industry Guidance (CAR-SOIL) and Decision Support Tools <https://www.claire.co.uk/projects-and-initiatives/asbestos-in-soil?start=6>
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- HSE (2013b). L143 Managing and working with asbestos Control of Asbestos Regulations 2012 Approved Code of Practice and guidance. <https://www.hse.gov.uk/pubns/books/l143.htm>
- HSE (2015). L64 The Health and Safety (Safety Signs and Signals) Regulations 1996 - Guidance on Regulations <https://www.hse.gov.uk/pubns/books/l64.htm>
- HSE (2018). HSG210 HSE Asbestos Essentials <https://www.hse.gov.uk/pubns/books/hsg210.htm>
- Occupational Safety and Health Administration (undated). Safety and Health Regulations for Construction, Standard Number 1926.1101 asbestos [https://www.osha.gov/pls/oshaweb/owadisp.show\_document?p\_id=10862&p\_table=STANDARDS]
- RIVM (2003) Assessment of the risks of soil contamination with asbestos, RIVM Report 711701034, National Institute of Public Health and the Environment, RIVM, Bilthoven, the Netherlands
- The Stationery Office (2012). The Control of Asbestos Regulations 2012. SI 2012 No. 632



### **APPENDIX A: PROCEDURE IF SUSPECTED ASBESTOS IS UNEXPECTEDLY ENCOUNTERED DURING GROUND INVESTIGATION**

The following field procedure is suggested if during ground investigation suspect asbestos is encountered in quantities and condition such that there is plausible potential that exposure in air is likely to exceed SALI and suitably trained personnel (AA and NLW) are carrying out the work.

- Don't panic – asbestos is only dangerous when disturbed and fibres are released and inhaled. If it is safely managed and contained it does not present a health hazard. The most commonly identifiable material found on or in the ground is fragmented asbestos cement sheeting. Bonded asbestos is not hazardous as long as it is not significantly disturbed or broken.
- Clear the area and don additional PPE and RPE.
- Without disturbing it further, try to assess what condition the suspected asbestos or ACM is in, whether it is fibrous, bound, degraded, dry or wet. If possible, take a photograph.
- Assess if the condition or the location means that the material is likely to be broken up or could release fibres when investigated or sampled.
- Dampen the suspected material where possible and always before sampling.
- If the material is an isolated fragment of ACM or suspected ACM then you may sample it as part of the soil sampling process provided that it is safe to do so.
  - Do not break up the material to sample it.
  - Place the soil sample in a secure container or bag and, in addition to normal labelling, label the sample as suspected of containing asbestos material.
  - Place the sample container in a sealed sample bag and label this again. This is for the benefit of those involved in transport, storage or laboratory testing. Failure to warn laboratories of the potential for asbestos in samples is a major cause of exposure.
- Do not remove or disturb any asbestos other than for sampling unless absolutely necessary. Always leave it where it was found because disturbing it may lead to the release of fibres.
- Review the situation against the fieldwork risk assessment to decide whether and how the intended fieldwork activity can be continued safely. If in doubt do not proceed until a further assessment by a specialist has been made.
- If the material is visibly fibrous and degraded or there is a significant amount of suspect material, i.e. not isolated fragments, then work should stop immediately as there is a potential risk of spreading the asbestos and of a wider exposure. In this case you should first follow the HSE guidance (which refers to isolating the exposure and decontamination protocols). You should then arrange for a ground investigation contractor with asbestos AA and NLW training and methodology to take samples for UKAS analysis.

**If site personnel have no asbestos training or only Asbestos Awareness, training, work must stop and additional risk assessment carried out.**

**If work is to cease after assessment, the area should be made safe before leaving site.**