CIRIA guidance
asbestos in soil
& made ground

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Asbestos mine in Troodos mountains, Cyprus
Aim

• “to improve the confidence and performance of practitioners particularly clients and other professionals when commissioning risk assessment and managing risk on sites that are potentially contaminated by asbestos”
CIRIA C733

1. Introduction
2. Client requirements for assessment and management of risks
3. Legislation relating to asbestos in soils
4. Asbestos types, uses and products
5. Asbestos and health
6. Human exposure to asbestos
7. Existing UK and other national guidance on asbestos in soils
8. Complying with Control of Asbestos Regulations 2012
9. Release of airborne fibres from asbestos-containing soils (ACS)
10. Preliminary risk assessment and developing the Conceptual Site Model
11. Soil sampling and analysis of asbestos in soil
12. Air monitoring and analysis of asbestos in the air
13. Exposure estimation
14. Risk estimation and evaluation
15. Remediation and risk management
16. Risk communication
17. Appointment of consultants, contractors and specialists
18. Conclusions and recommendations
3. Legislation relating to asbestos in soils

Protection of workers and general public:
- Control of Asbestos Regulations 2012
- Health and Safety at Work etc Act 1974
- Construction (Design and Management) Regulations 2015
- Management of Health and Safety at Work Regulations 1999
- Common Law torts of negligence or public nuisance

Who liable for remediation costs:
- Part IIA of the Environmental Protection Act 1990
- Environmental Damage (Prevention & Remediation) Regulations 2009 as amended
- Contract Law – breach of contract
- Common Law torts of negligence or public nuisance

Who liable for compensating mesothelioma victims:
- Common Law torts of negligence or public nuisance, or breach of statutory duty
- The Compensation Act 2006 (liability is joint and several)
3. Legislation relating to asbestos in soils

Site Investigation activities:

- Control of Asbestos Regulations 2012
- Health and Safety at Work etc Act 1974
- Construction (Design and Management) Regulations 2015
- Common Law torts of negligence or public nuisance, or breach of statutory duty

Disposal of Asbestos-containing Investigation activities:

- Hazardous Waste (England and Wales) Regulations 2005
- The List of Wastes (England) Regulations 2005 as amended
3. Legislation relating to asbestos in soils

Does the land containing asbestos require remediation?:

• Environmental Damage (Prevention & Remediation) Regulations 2009 as amended
• Part IIA of the Environmental Protection Act 1990
• The Environmental Permitting (England and Wales) Regulations 2010
• Town and Country Planning Acts
• Common Law torts of negligence or public nuisance
7. Existing UK guidance on asbestos in soils - free

- Assess industrial & waste disposal sites
- Amount and form of asbestos in soil?
- Remediation techniques
- Ease of public access?
- Suitable for use?
- H&S precautions

- Laboratory studies have shown that dangerous concentrations of respirable fibres may be released from loose dry soil with asbestos concentrations of as low as 0.001% by weight

Label samples “suspected asbestos”
7. Existing UK guidance on asbestos in soils

6.1 SITE INVESTIGATION PROCEDURE

START

Desk top study

Is there a foreseeable risk of asbestos being present on site?

YES

Is there a foreseeable risk of air-borne fibre release?

YES

Investigation is Notifiable under CAR2012 unless the risk assessment clearly indicates that the exposure of any employee to asbestos is not liable to exceed the Control Limit.

NO

Proceed only with Expert Guidance

NO

Proceed with Due Care

NO

Proceed as Normal

Examples:

Low Risk: Greenfield sites.

Fibre release depends on:
- Type of material (insulation, lagging, other loose materials. Higher potential, loose cement).
- Condition eg damaged/well broken up.
- Wet/damp or dry.
- Buried or not.

Examples:

Low Risk: Undisturbed Hard Cover.
7. Existing UK guidance on asbestos in soils

Recommended Laboratory Procedure:

- Sample receipt
- Is lab specially equipped to safely handle asbestos?
  - NO → Quarantine Sample
  - YES → Is sample labelled as potentially containing asbestos?
    - NO → Request AGS SIARA Form A + B
    - YES → Is there a definite asbestos risk?
      - NO → Proceed with geotechnical testing using correct PPE and decontamination procedures
      - YES → Is the sample natural soil?
        - NO → Asbestos detected
        - YES → Sub-sample wearing PPE and send to analyst for screening
          - CLEAR
8. Complying with Control of Asbestos Regulations 2012 – Risk Assessments, licensing and training

- Before starting any work that is likely to disturb asbestos, a suitable and sufficient risk assessment must be prepared by the employer.

- Whoever carries out the risk assessment must:
  - be competent to do the risk assessment
  - carry it out before work begins and allow enough time to put appropriate precautions in place
  - make sure the assessment is job specific and considers all aspects of the work
  - Communicate the risk assessment to employees undertaking the work

- Wealth of helpful guidance on Health & Safety Executive website

- Hazard: Disturbing asbestos during site walkover, ground investigation, laboratory analysis, remediation

- Risks: type of asbestos, degree of exposure, who at risk, existing conditions

- Employer to take steps to prevent exposure or reduce it to the lowest level reasonably practicable

- Management Regs 1999: General Principles of Prevention – Eliminate, Adapt, collective protection, training

- Employees: Suitable training, information, supervision, health surveillance
8. Complying with Control of Asbestos Regulations 2012 – Risk Assessments, licensing and training

Licensed Asbestos Work:

• To only be undertaken by HSE-licensed contractor
• Notifiable work - inform HSE using online form FODASB5. 14 days notice
• E.g. remediation of crocidolite lagging from industrial tip

Notifiable Non-licensed Work:

• To be undertaken by competent contractor. Medical surveillance required.
• Notifiable Non-Licensable Work - inform HSE using online form ASBNNLW1
• E.g. remediation of small amount of good condition asbestos insulation board

Non licensed:

• To be undertaken by competent contractor
• Reg 3 (c)(iv) “the collection and analysis of samples to ascertain whether a specific material contains asbestos”, i.e ground investigation sampling and laboratory analysis”
• E.g. remediation of asbestos-cement roof sheets
8. Complying with Control of Asbestos Regulations 2012 –

Illustration of Asbestos Work Categories

- Loose fill lagging insulation
- Lagging and sprayed insulation
- Asbestos insulation – if significant work that exceeds the control limit
- Loose dust & small pieces of debris (gross contamination)
- Asbestos insulating board (AIB) – if significant work that exceeds the control limit
- Asbestos insulation/AIB – if short duration work below control limit and removal work not part of maintenance
- Textured decorative coatings – using gels/steam for large-scale removal
- Paper, felt and cardboard e.g. electrical equipment insulation, ropes and yarns or cloth, or gaskets and washers – depending on condition – if poor condition or degraded during work NNLW, if kept virtually intact non-licensed
- AIB – if short duration work below control limit and part of maintenance work
- Textured decorative coatings – only when carefully cutting around backing sheets to achieve removal intact
- Strings kept virtually intact e.g. removed whole
- Resin-based materials e.g. friction products/brake lining
- Conveyor belts/ drive belts
- Asbestos cement products
- Thermoplastic/vinyl floor tiles, bitumen roof felt shingles, asbestos paper damp proof coatings, mastics, asbestos paper backed PVC floors, resurfaced PVC panels & compounds

High fibre release when disturbed = higher risk work

Licensed Asbestos Work

Notifiable Non-Licensed Asbestos Work

Non-Licensed Asbestos Work
10. Preliminary risk assessment and developing the Conceptual Site Model

- **Source** (substance present at unacceptable concentration or form)
- **Pathway** (migration, airborne, inhalation, ingestion)
- **Receptor** (human being)
16. Risk communication – worry, blight, costs

**Health effects of acute exposure:**
- Acute high level exposure may cause pleural disorders, mesothelioma or lung cancer after a long latency period

**Health effects of chronic exposure:**
- Chronic low level inhalation exposure may cause pleural disorders, mesothelioma or lung cancer
- Chronic high dose exposure may cause asbestosis

**October 2014:** The Australian Capital Territory Government in October determined “Mr. Fluffy” homes in Canberra were uninhabitable and announced it would buy and demolish all 1,021 houses previously insulated with loose-fill blue asbestos.

**Australian property experts believe it is the biggest residential buyback program in Australian history.**

- Useful references in C733:
  NICOLE / Schelwald-van der Kley (2004). Communication on contaminated land
  SNIFFER (2010). Communicating understanding of contaminated land risks
17. Appointment of consultants, contractors & specialists

• Client responsible for procuring competent contractors for the task


• Ground investigations – Designers and Contractors able to design ground investigation to assess condition of ground. UKAS laboratories provide analysis of asbestos debris and soil samples. Key is need for competent vigilant staff on site is be able to identify suspected asbestos and take a sample.

• The successful investigation, assessment and management of ACMs at many sites will require skills, knowledge and experience from both disciplines.

• At most sites, asbestos will be one of many contaminants which require assessment and remediation. Remediation methods to be compatible to ensure site is suitable for current or future use.
17. Factors to consider:

- Previous experience and capability of similar work
- Insurance – employers liability and professional indemnity insurance – check it does not specifically exclude asbestos-related work.
- Suitable competencies of staff – training, qualification and experience will be specific to the project
- Competent staff available for your project (specialists in demand)
- Asbestos competencies – recognising ACM, air monitoring, UKAS accredited
- Management of ground investigation in accordance with CAR 2012 and CDM 2015
- Knowledge and experience of applying asbestos exposure-risk models to ACM
18. C733 Conclusions and recommendations

• The extent of asbestos-contamination of ground is not known.

• Scientific understanding of the risks from low level exposure to asbestos has continued to develop and there is strong evidence that it poses a small, but real risk to health.

• CAR 2012 applies to all site walkovers, ground investigations, demolition and remediation projects where asbestos will be disturbed.

• PLM methods based on HSG248 are appropriate for analysing asbestos in soils.

• Asbestos report should report nature of ACM, type and quantities

• Quantitative soil risk assessment only necessary if there is sufficient evidence from soil / air analyses to cause concern regarding current or future risks.

• There are currently no suitable UK Guideline Values for asbestos in soil. DO NOT use hazardous waste threshold 0.1% or ICRCL value 0.001%

• Hodson & Darnton model – assess exposure from soil

• Recycled “inert” aggregates – beware asbestos