

# **Soil Treatment & Materials Recovery in the South West Workshop**

## **Control of Asbestos Regulations 2012 Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials: an Overview of Key Compliance Issues**

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Steve Forster BSC, MSc, CEnv, FGS, MIEEnvSc  
Director, Remedia Group Ltd/Chair, JIWG

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# Outline

## CAR-SOIL: key compliance issues

- Background.
- Definition: asbestos-contaminated ground materials.
- The asbestos licencing regime applied to land.
- Licensed Work and Non-Licensed Work.
- Competence and training.
- Exemplar case study.

# Asbestos in Made Ground

intact asbestos cement debris to underside of concrete slab



Photo courtesy of Soilfix Limited

# Asbestos in Made Ground

**highly degraded/disaggregated asbestos insulation/fibrous debris**

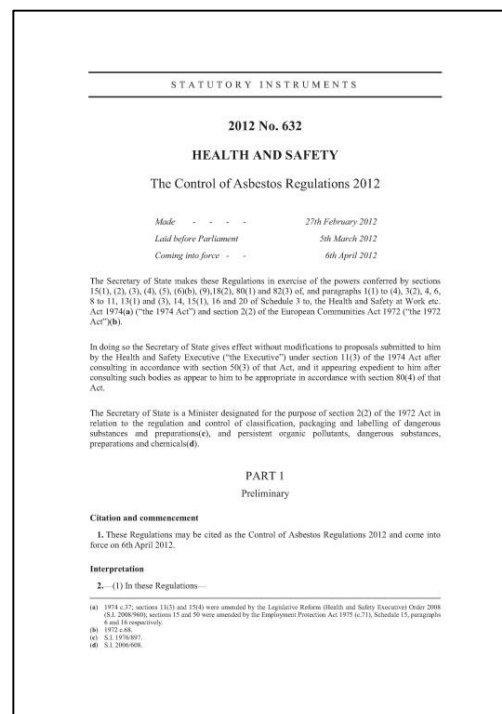
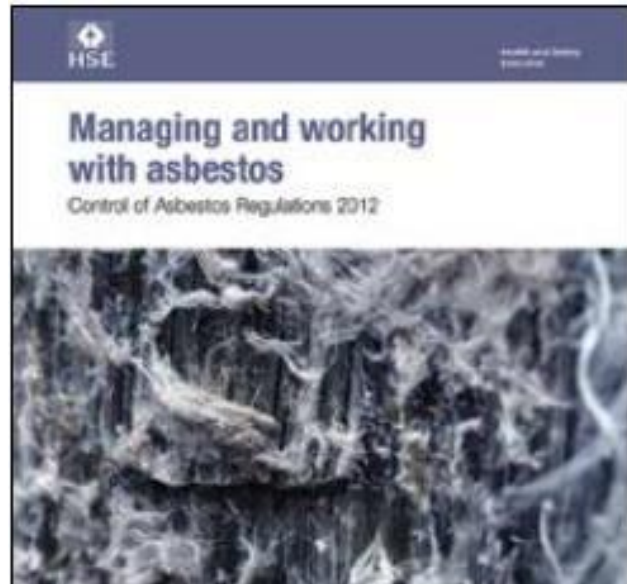




# Overview

## background to CAR-SOIL:

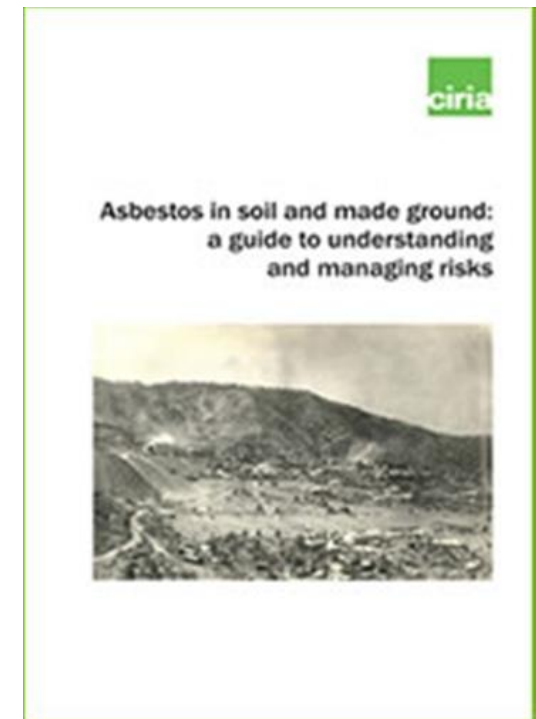
- How should we deal with these materials?
- Risks the same as equivalent materials in buildings?
- Licensed work, or not?



# Overview

## background to CAR-SOIL:

- JIWG AiSCoP
  - originally no plans to cover CAR2012 in great detail;
  - no room or scope for interpretation; and
  - ‘the regulations are the regulations’
- CIRIA C733, 2014
  - restatement of existing position; or
  - considered opinion; and
  - no creative interpretation.



# Overview

## background to CAR-SOIL:

- HSE L143 ACOP and guidance insufficient;
  - not always applicable to ground;
  - soil matrix-specific risks had to be addressed;
  - root and branch review of HSE L143 ACoP;
  - HSE engagement and support from day 1;
  - extensive discussions and debate; and
  - multiple reviews, including HSE legal, HSE PGG.
- 
- HSE changed position on several key issues, accepted pragmatic approach to interpretation!

# Overview

## CAR-SOIL, 2016



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

CAR-SOIL™

Control of Asbestos Regulations 2012

Interpretation for Managing and Working  
with Asbestos in Soil and Construction  
and Demolition Materials

Industry guidance

**6700+ Downloads**

**CL:AIRE**

- Definitive.
- Eliminates uncertainty; levels the playing field.
- Tools to reduce risk; health and commercial.
- Increases confidence.
- Agreed/endorsed by HSE.
- Applies in E, W, & S (HSE).
- Northern Ireland (HSENI)?
- Well-received by industry.
- [www.claire.co.uk/asbestos](http://www.claire.co.uk/asbestos)



# Audience

who will benefit most from this industry guidance?

- Geoenvironmental consultants & land surveyors.
  - Ground investigation workers.
  - Demolition and construction workers.
  - Waste processing and recycling plant operators.
  - General groundworkers.
  - Construction plant operators.
  - Land remediation contractors.
- 
- Managers, supervisors of the above.
  - Clients, regulators, key stakeholders.



# Work with Asbestos in Soil/C&D Materials

## includes...

- Site investigations and surveys.
- Monitoring activities and air sampling.
- Demolition of above ground and surface structures.
- Production and use of recycled aggregate (RA).
- Ground improvement operations.
- Installation of foundations.
- Excavations and earthworks and landscaping.
- Installation of underground utilities.
- Land remediation work.
- 'Maintenance'.



# Work with Asbestos in Soil/C&D Materials

## the need to address several fundamental issues...

- What is an asbestos-contaminated ground material?
- When do CAR2012 apply?
- When CAR2012 do apply, can the licensing regime be relaxed to account for the fact that ...
  - *‘Soil and C&D materials contaminated with asbestos insulation and coatings are unlikely to present the same degree of risk as the equivalent materials in buildings, especially when naturally wetted.’*

# Definition of 'asbestos'

## CAR2012 definition of asbestos:

- 'Asbestos' is the general term for 6 fibrous silicates: crocidolite, amosite, chrysotile (plus, actinolite, anthophyllite, tremolite).
- An asbestos-containing material includes any mixture containing one or more of these fibrous silicates at more than 'trace' amounts.
- CAR2012 conceived for products, not ground materials contaminated with asbestos!

# Definition of 'Asbestos'

## in soil and C&D materials

- HSG248, The Analysts' Guide, allows for LOD of 2 fibres or fewer = 'trace' and = not asbestos, to allow for impurities in materials.
- Pragmatic and practical work-around, based on SCA BBM:
  - Quantification LOD = 0.0001% but = >2 fibres.
  - Larger samples.
  - Extended, more rigorous methodology.



# Definition of 'Asbestos'

## in soil and C&D materials

- **Watch Point 2:**
  - “... if no fragments of ACMs are isolated ...
  - ... fewer than three asbestos fibres identified during ...
  - ... detailed and extended identification and gravimetric analysis procedures combined,
  - mass concentration of asbestos fibre is likely to be many orders of magnitude below the 0.0001% w/w LOD.”

# Definition of 'Asbestos'

## in soil and C&D materials

- **Watch Point 2:**
  - “... risk from exposure to such trivial concentrations of asbestos ...
  - in external environment likely to be very low/negligible ...
  - such material ... not strictly an ACM that falls under the definition of asbestos in the Regulations.”
- **Always ‘trace’!**

# Definition of 'Asbestos'

## in soil and C&D materials

- *"... isolated or 'trace' asbestos fibres and/or isolated or random individual pieces of ACMs,*
- *might fall outside the scope of the Regulations*
- *dependent on what is considered 'reasonably practicable' in each case ...*
- *assuming a suitable and sufficient investigation and assessment of the site has been carried out."*
- **May be** 'trace', but use ...
- Diligence, lines of evidence, robust assessment.

# Definition of 'Asbestos'

## CAR-SOIL definition of asbestos-contaminated ground material:

- For soil/C&D materials – ref. SCA BBM/CAR-SOIL:
  - Practical Limit of Detection (LOD) ... <0.0001% wt/wt = will be 'trace'.
  - Practical Limit of Quantification (LOQ) ... <0.001% wt/wt = may be 'trace', as long as ...
- ... very few isolated fibres and occasional/sporadic and random ACMs present, dependent on what is considered 'reasonably practicable' in each case.

# Work with Asbestos

## ...and the licensing regime

- 'Work with asbestos' defined in CAR2012:
  - work which removes, repairs or disturbs asbestos
- Primary work activities listed previously.
- 'Licensed Work' includes work:
  - on asbestos coating (but not including textured decorative coatings); or
  - on asbestos insulation or AIB where the risk assessment demonstrates that the work is not SALI, the control limit will be exceeded and it is not short duration work.



# Work with Asbestos

## ...comparison of risks: asbestos in buildings and in soil

- However ...
- “... *the nature and degree of potential risks* ...
- ... *when working with asbestos-contaminated soil or C&D materials in the external environment ...*
- ... *is significantly lower* *than that which might be expected when working with ACMs internally within buildings.*”

# Work with Asbestos

## ...deciding if work is licensed

- Overarching: Regs. 2(1)(a) and (b); if yes, LW.
- Asbestos coatings: always LW.
- Insulation or AIB: almost certainly LW.
- Unless work does not meet the conditions in the definition of LW in Reg. 2(1).
- **Material description has consequences!**
- ‘Original form’ or ‘clearly identifiable’?
- ‘Debris’ or ‘loose fibrous material/fibrous board’?

# Work with Asbestos

## ...deciding if work is licensed

- **Watch Point 6:**

- *‘Clearly Identifiable Original Form’ is taken to mean that it is possible for a trained and competent person to identify the type of material presumed to be ACM from its appearance in situ on site.”*
- Context/evidence/justification.
- If not CIOF, = debris; may revert to Control Limit determination.
- If not CIOF, then not automatically LW.

# Work with Asbestos

## ...deciding if work is licensed

- **Watch Point 7:**
  - *“The potential airborne fibre release from fragments of fibrous materials and/or dispersed debris that may originally have been asbestos insulation or AIB ... in soil and C&D materials, is likely to be lower, **possibly even by several orders of magnitude** than airborne fibre releases from equivalent ACMs encountered in buildings.”*
- Wetted material, bound to ground material matrix.
- <CL, <STEL and ... <Clearance Indicator Limit?

# Work with Asbestos

## ...deciding if work is licensed

- **Watch Point 8:**
- **JIWG Work Category Spreadsheet – DST.**
- **Qualitative hazard and risk ranking** phrases.
- Based on HSG264 and HSG227; structured, comparative.
- Simon Cole, AECOM/Garry Burdett, HSL.
- **Risk assessment** and **licensing status** for POW.
- Real and assumed data; model scenarios.



# Asbestos in Soil and C&D Materials

## risk factors to be considered – JIWG Work Category DST ...

**JIWG**

Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Project Reference  
Site Name  
Client  
Run by  
Date  
Scenario details

### Decision Support Tool for CAR2012 Work Categories

#### Stage 1

##### Hazard Factors

Select ACM type (run model for each type to generate 'Worst Case' output)

Extent of degradation of ACMs at outset of work

Friability and degree of bonding by matrix (ACM matrix, not ground materials)

Distribution of Visible Asbestos Across Affected Area

Amount of asbestos fibre in selected ACM/fibre type as % of host material

Sub-total

	Score
Loose fibrous asbestos debris	3
Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Sporadic/random occurrences of visible contamination by ACMs	2
No visible ACMs/fibre bundles	2
Occasional/random occurrences of visible contamination by ACMs	
Sporadic/random occurrences of visible contamination by ACMs	
Moderate/frequent occurrences of visible contamination by ACMs	
Gross/very frequent occurrences of visible contamination by ACMs	15

Note: the asbestos licensing regime is unaffected by the type of asbestos fibre present in ACMs

Hazard ranking

Medium

[www.claire.co.uk/asbestos-dst](http://www.claire.co.uk/asbestos-dst)

# Asbestos in Soil and C&D Materials

## risk factors to be considered – JIWG Work Category DST ...

**JIWG**

Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

### Stage 2

#### Exposure Factors

Anticipated airborne fibre concentration - Control Limit or SALI?

Anticipated duration of exposure to asbestos

Activity type and effect on deterioration of ACMs during work

Best description of primary host material matrix (soil/made ground)

Respirable fibre index for ACM - RIVM report 711701034 (2003)

<0.1 fibres/ml (4 Hr TWA) or <0.6 fibres/ml (10 minute STEL)

<0.001 fibres/ml

<0.01 fibres/ml

<0.1 fibres/ml (4 Hr TWA) or <0.6 fibres/ml (10 minute STEL)

>0.1 fibres/ml (4 Hr TWA) or >0.6 fibres/ml (10 minute STEL)

High

Score

2

4

0

1

4

Sub-total

11

Exposure ranking

Medium

Combined hazard and exposure ranking

26

Medium

# Asbestos in Soil and C&D Materials

## licensing status and controls – JIWG Work Category DST ...

**JIWG****Joint Industry Working Group**

Asbestos in Soil and Construction &amp; Demolition Materials

### 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

# Asbestos in Soil and C&D Materials

## JIWG Work Category (Asbestos Licensing) DST ...

- For use by 'competent persons' to undertake qualitative risk assessments for asbestos POWs.
- Provides confidence that correct licensing status is selected based on robust framework.
- Matches risk, licensing status, to controls.
- HSE-agreed risk-based 'work-around' to rigid definition of LW in CAR2012 for coatings, insulation and AIB.
- Loose fibrous asbestos, fibrous board = NLW/NNLW?

# Asbestos in Soil and C&D Materials

## risk factors to be considered – JIWG Work Category DST ...

- ACM type or ‘free dispersed fibres’ mixed-in.
- Weathered, intact, degraded, disaggregated.
- Friability - ability to escape to air (or bonded?).
- Distribution across site surface (and at depth) - occasional, sporadic or gross/major?
- Amount (quantity).
- Type of work activity is expected and the duration?
- Exposure levels (air concentrations).
- Matrix/host material type.
- Respirable fibre index for ACM (RIVM).

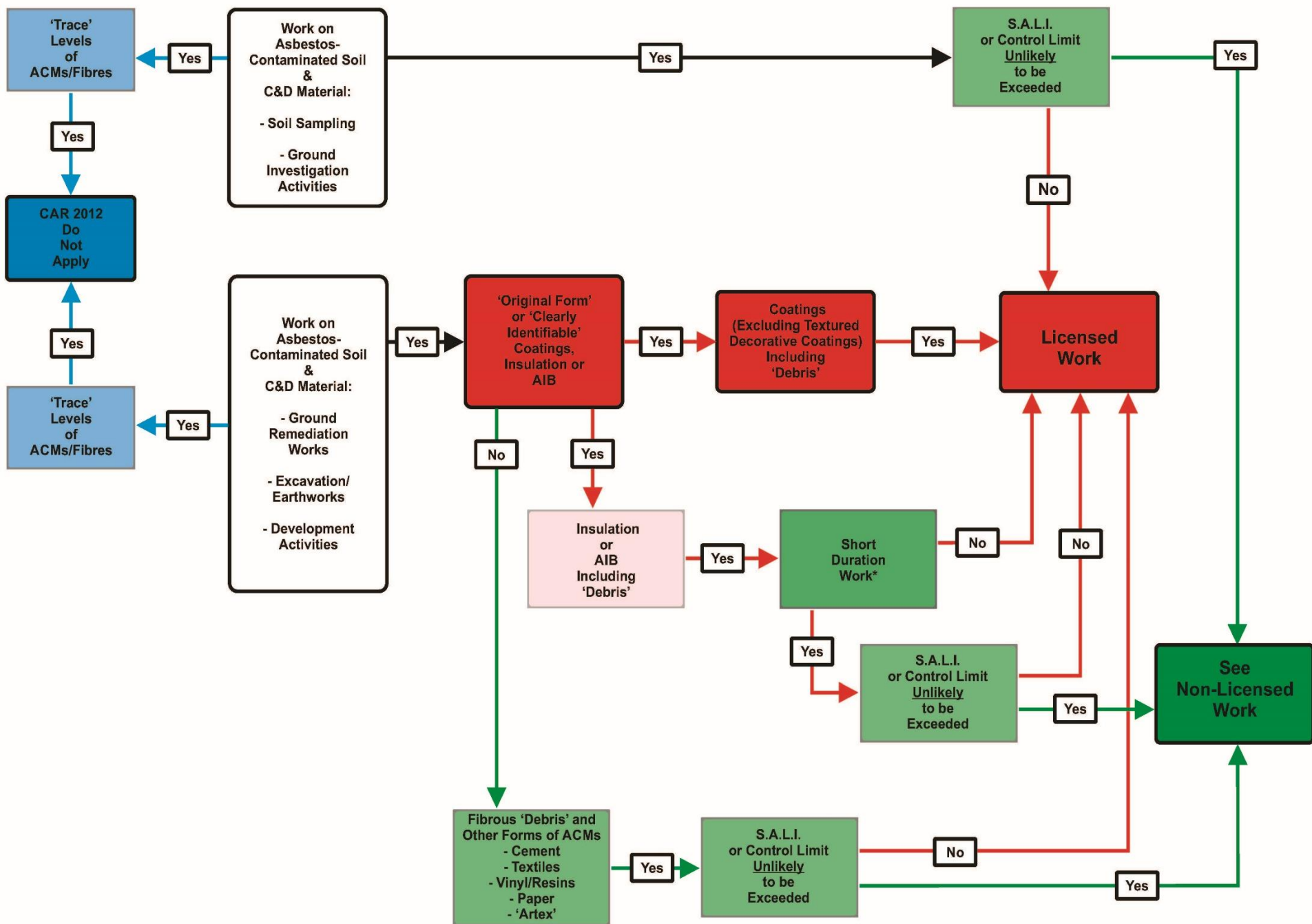


# Decision Flowcharts for Asbestos in Soil

## ...what is LW?

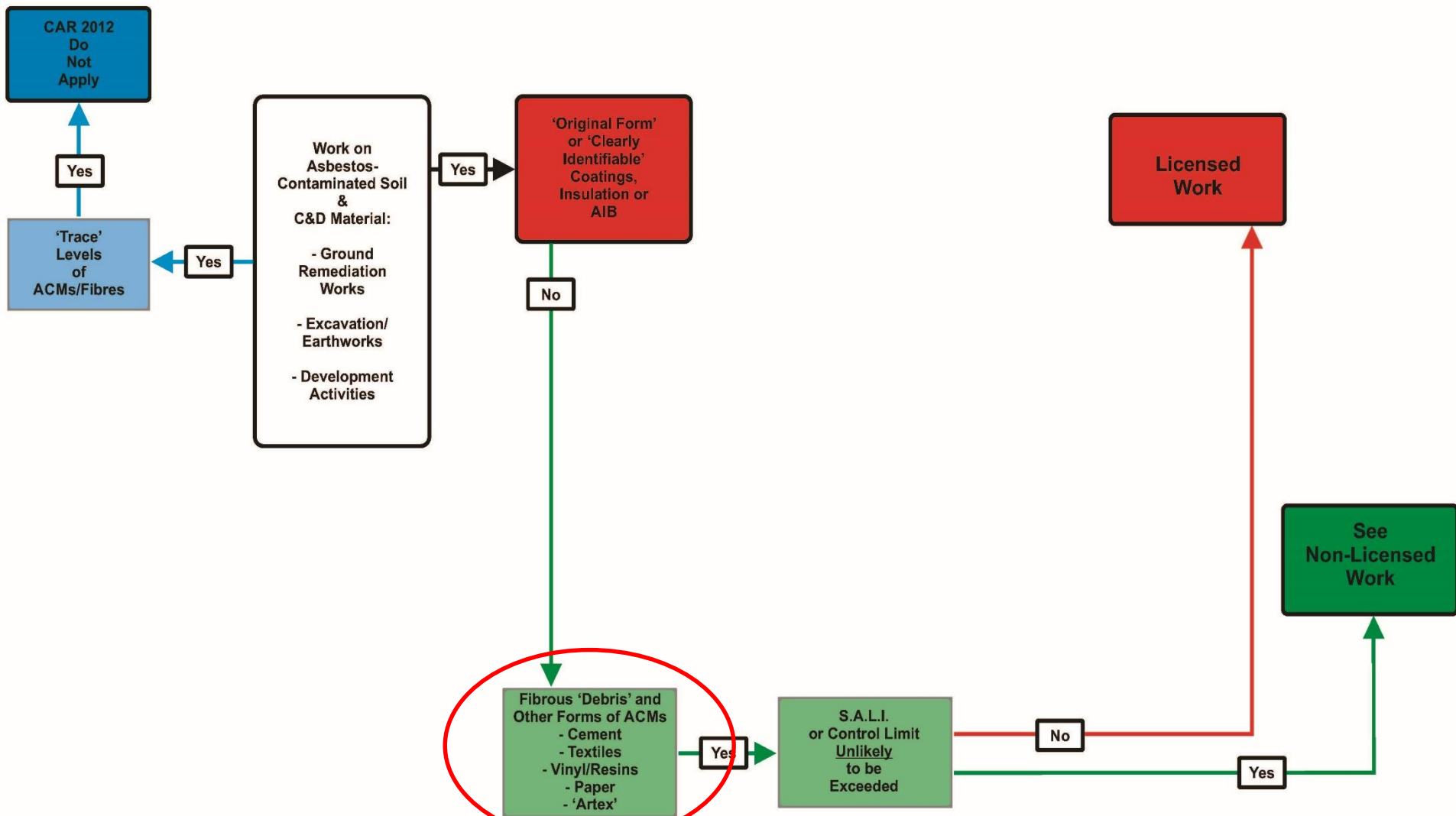
- Decision flowchart for:
- Licensed Work:
  - Coatings
  - Insulation/AIB and 'debris' – Short Duration, SALI and Control Limit not exceeded
- Non-Licensed Work/NNLW:
  - Fibrous 'debris'
  - Other ACMs

# Licensed Work Decision Flowchart



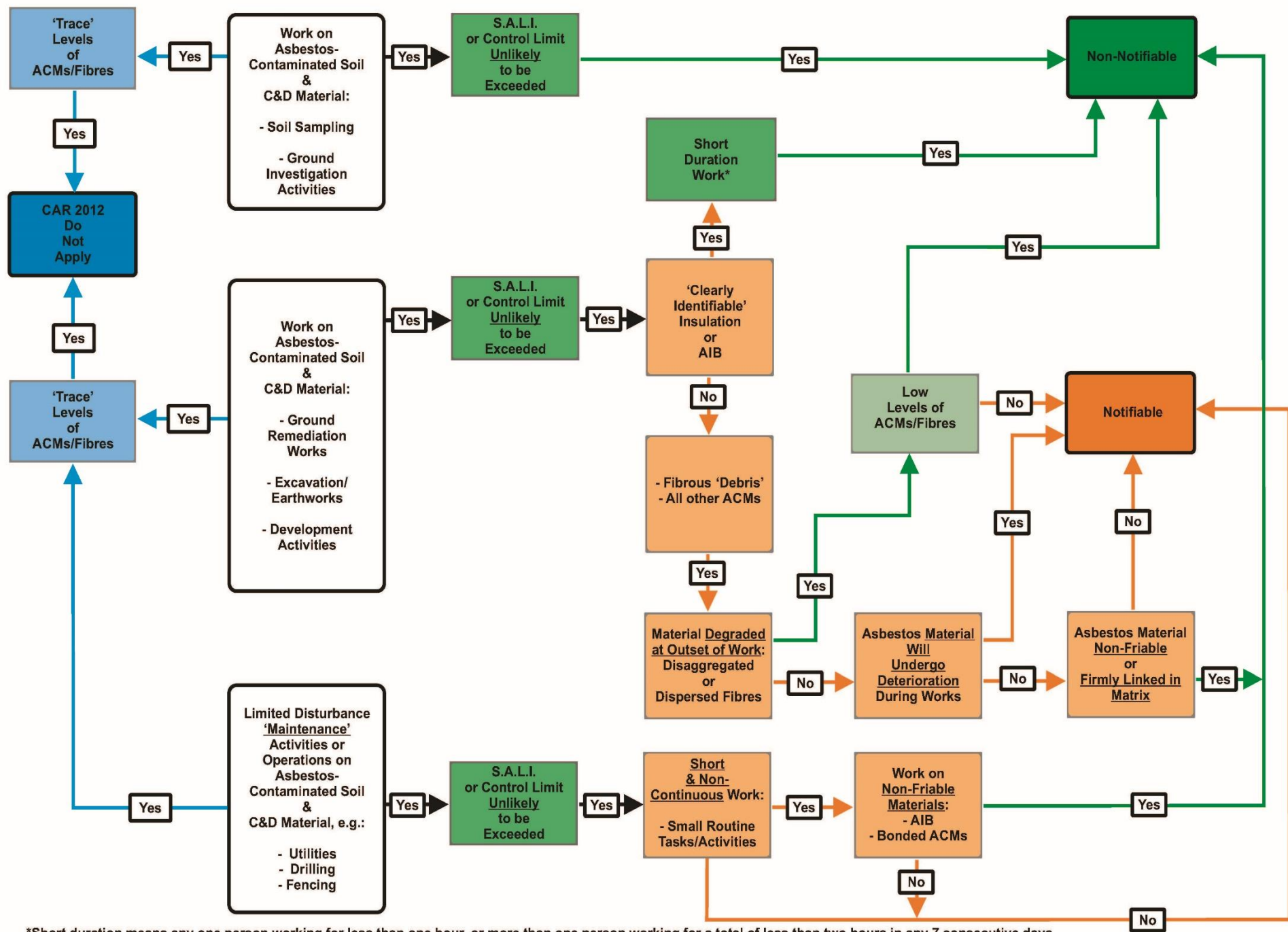
\*Short duration means any one person working for less than one hour, or more than one person working for a total of less than two hours in any 7 consecutive days.

# Licensed Work Decision Flowchart - Step 4

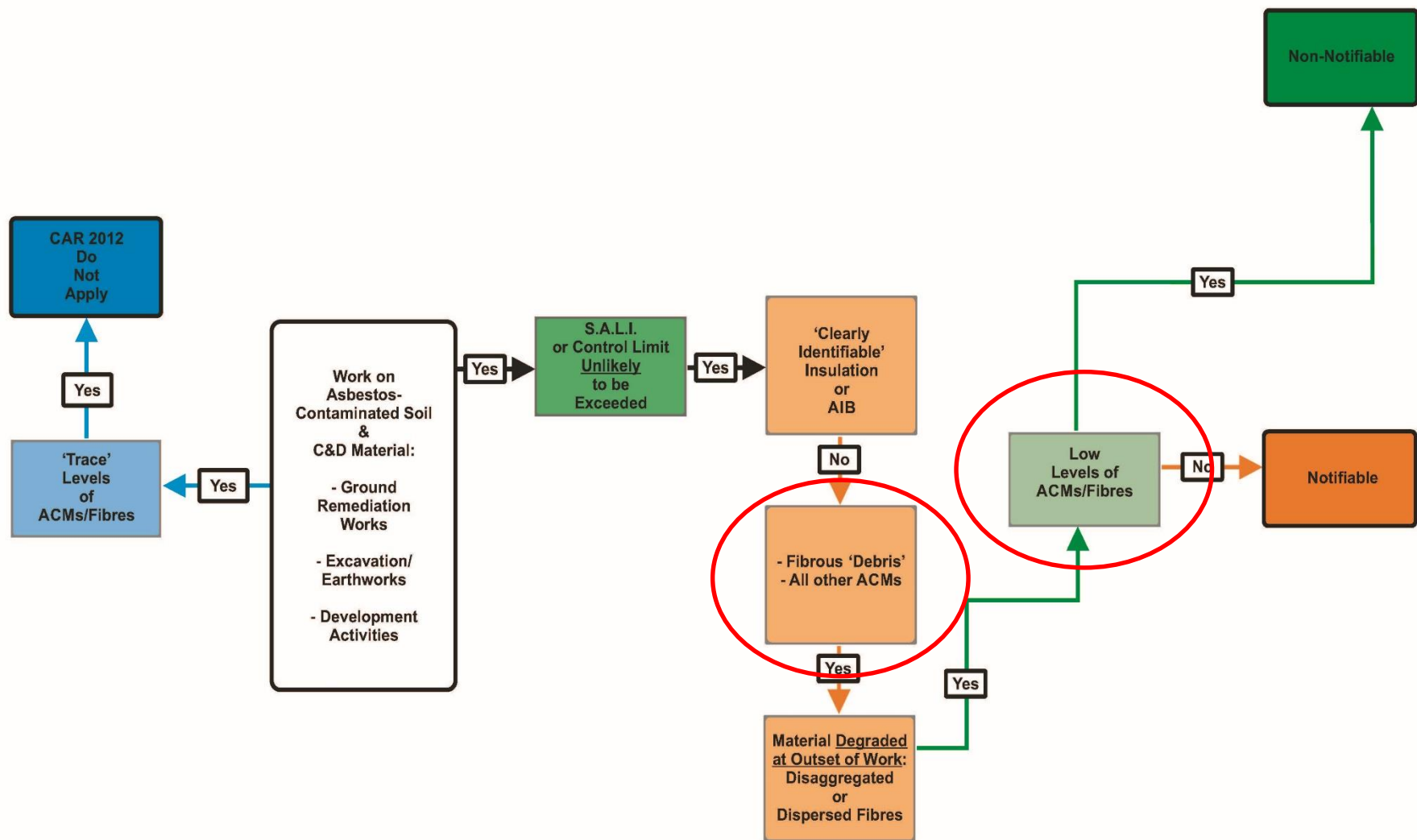


\*Short duration means any one person working for less than one hour, or more than one person working for a total of less than two hours in any 7 consecutive days.

# Non-Licensed Work Decision Flowchart



# Non-Licensed Work Decision Flowchart - Step 3



# Competence

## asbestos in soil and C&D materials ...

- Need clearly-defined skill sets for addressing asbestos in, on or under the land.
- Asbestos training alone will not be sufficient.
- Geoenvironmental and Asbestos sectors must skill up to meet expectations and demands ... PII/claims!
- Appropriate IIT (Reg. 10 CAR2012).
- Asbestos Awareness and NLW for any employee whose work may disturb asbestos in the ground.
- Management training essential to avoid pitfalls (technical and commercial).

# CAR2012 Reg. 10: IIT

## what is competence?

- Assessment of land contaminated by asbestos is **excluded from competence requirements**, but ...
- ... **Watch Point 18:**
  - competence requirements for land are required by other environmental regimes ...
  - ... so one must be **competent in asbestos** (or work under the direction of a suitably qualified and competent person), and
  - satisfy need for training, skills and practical experience to cover additional **non-asbestos contamination** risks.



# CAR2012 Reg. 10: IIT

## what is competence?

- *“A competent person ... has received the appropriate degree of relevant IIT, but who can demonstrate that they have and maintain the correct combination of relevant practical experience and professional qualification(s).”*
- NPPF: A person with a **recognised relevant qualification, sufficient experience** in dealing with the type(s) of pollution ..., and **membership of a relevant professional organisation.**
- NQMS?



# CAR2012 Reg. 10: IIT

## recognised asbestos training courses

- Asbestos awareness.
- NLW, including NNLW.
- BOHS Proficiency Modules.
- ARCA/ATaC.
- All courses examined/require pass.
- CAR-SOIL, AA and NLW for land contaminated by asbestos available from CL:AIRE.
  - [www.claire.co.uk/projects-and-initiatives/asbestos-training](http://www.claire.co.uk/projects-and-initiatives/asbestos-training)
- CL:AIRE listing on HSE website as recognised training provider for land.
- Other courses, etc. to broaden knowledge.

# Exemplar Case Study

**CAR-SOIL should help avoid this in future...**

- Parcel of development land:
  - already remediated by reputable contractor;
  - asbestos removed prior to demolition;
  - all validated by reputable consultant;
  - work signed off under Planning by LA;
  - sold with Collateral Warranty.
- Geotechnical survey for foundation design; routine chemical contamination analysis ...
- Asbestos fibres detected at  $<0.001\%$  wt/wt ...???

# Exemplar Case Study

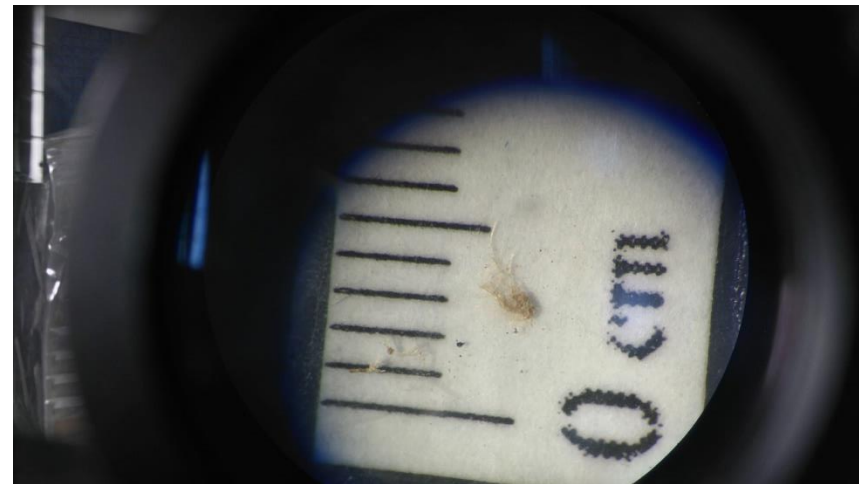
## CAR-SOIL should help avoid this in future...

- Ground stabilisation contractor pulled out – cannot work with ‘asbestos’.
- Well-known environmental consultancy assessed asbestos risk as high/acute; whole site requiring remediation by engineered cover system; +££££!
- Planning consent not forthcoming;
- Client considers options, development stalls 2 years, +££££!

# Exemplar Case Study

## enter CAR-SOIL ...

- Reassessed asbestos risks; 'negligible' based on 'lines of evidence'/laboratory results.
- Asbestos fibres detected at  $<0.001\%$  wt/wt = only a few fibres; and 3 surface fragments of AC over the entire site.
- No remediation required, CAR2012 DO NOT apply to groundworks.



# Exemplar Case Study

## enter CAR-SOIL ...

- Contractors back on board, development back on track.
- **Planning consent** with no pre-start conditions for asbestos, based on:
  - robust and defensible assessment;
  - outline **precautionary** asbestos management and monitoring plan;
  - asbestos awareness training for contractors.



# Thank you for listening

## ... contact details

Stephen Forster, Remedia: [steve@remediagroup.co.uk](mailto:steve@remediagroup.co.uk)

 @RemediaGroup

[www.claire.co.uk/asbestos](http://www.claire.co.uk/asbestos)

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