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South Tyneside Council

Holborn Enabling Works

Asbestos Scope

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1. Introduction & Background

1.1 Instruction & Site Description

Lucion Environmental (Lucion) were instructed by South Tyneside Council (Client) to produce a stand-alone asbestos scope report to be used by a future Principal Contractor (PC) when tendering and carrying out the enabling works. This report should be read alongside other associated site reports listed in Section 1.2.

The proposed enabling works are located at East Holborn, South Tyneside situated between the River Tyne and Commercial Road, South Shields, NE33 1RN, referred to as the 'Site' (Figure 1 Site Boundary).

This report specifically details the asbestos scope for the enabling works. The main aims for this report are to provide pertinent information of known asbestos contamination at the site, so the Principal Contractor can implement the necessary control and mitigation measures to ensure site workers, surrounding off-site human receptors and environmental receptors are not put at an unacceptable short term risk during the enabling works. This report also includes the required sampling and placement of soils, on-site, in order to achieve the Finished Landform Profile Level.

Sections 8 and 9 of this report provide the Principal Contractor and their subcontractors with the enabling works asbestos scope of activities and the associated responsibilities.

No works shall be undertaken on-site until the remediation strategy report produced by Mott MacDonald and asbestos review, assessment and management plan report produced by Lucion, are approved by the relevant regulators in writing (reports highlighted in bold Section 1.2). This report specifically refers to asbestos contamination while all other geoenvironmental factors are considered in the Mott MacDonald CLRA & Remediation Strategy and associated scope reports. It is not the intention of this report to provide a detailed specification for the enabling works.

The Principal Contractor shall produce a Material Management Plan (MMP) in accordance with the CL:AIRE Definition of Waste (DoW) Code of Practice (CoP) with a declaration to be signed off by a Qualified Person (QP).

In order to achieve a Finished Landform Profile Level (FLPL), it is considered that the enabling works will include mechanical excavation, processing and re-use of suitable soils and crushed hardstanding materials on site.

Rather than disposing of asbestos containing soils off-site, there is potential to retain soils that do not contain visible fragments and are below the asbestos hazardous waste threshold of 0.1%. Further information regarding the placement of soils on site is provided in Section 8, Activity 7.

Following the enabling works, the final development will require the future developer(s) to formally submit a human health risk assessment and outline the associated end use mitigation measures to the Local Planning Authority for approval. At present, the future development is understood to include residential and commercial buildings, hardstanding and a cover system in areas of soft landscaping and residential garden areas including hi-vis geotextile placed below imported clean cover soils.

1.2 Previous Associated Reports

The previous ground investigations and associated site reports are listed below with pertinent asbestos information summarised in Sections 3, 4 and 5.

- CL Associates, Ground Investigation and Contamination Assessment, Factual & Interpretative Reports, RPT's 43024/2 & 43024/3, August 2003.
- Parsons Brinckerhoff Ltd (PB Ltd), Preliminary Risk Assessment, RPT 200732599.1931, March 2008.

- Parsons Brinckerhoff Ltd (PB Ltd), Geoenvironmental Assessment, FSE97010A.2098, January 2009 (AEG 2008).
- Mott MacDonald, Contaminated Land Strategy, Holborn Remediation, 20160331 (Rev A), March 2016.
- Mott MacDonald, Contaminated Land Strategy, Holborn Lower Levels, 20180213, February 2018.
- Dunelm Geotechnical and Environmental, Ground Investigation, D7873, Factual V.02, December 2018 (Upper Levels).
- Allied Exploration & Geotechnics Ltd (AEG Ltd), Holborn Lower Levels and Windmill Hill, Final Factual Report, Rev.01, March 2019.
- **Mott MacDonald, Holborn Phase 2 CLRA & Remediation Strategy, 20190508 (Rev A), May 2019.**
- Lucion, Land Management Considerations - Surface Asbestos Contamination, 371040, V0, October 2019.
- **Lucion, Holborn Enabling Works and Follow on Development - Asbestos Review, Assessment & Management Plan, 357669, Final V0, November 2019.**
- Lucion, Holborn, Summary Following Third Party Removal of Surface Asbestos Containing Materials, 412709, V0, May 2020.
- Lucion, Holborn, Phase Contrast Microscopy Perimeter Air Testing JN413864 (May, June, July, Aug, Sept and Nov 2020).

1.3 Site History, Landfilling & Demolition

The former use of the main site referred to as 'Middle Docks' was a ship repair yard with associated buildings and infrastructure. The yard was formerly operated by the Tyne Dock Engineering Company and Cammell Laird. Four large former graving docks are located in the west of the site, referred to as GD1 to GD4. It is considered likely that the docks area was historically reclaimed from the intertidal areas of the River Tyne, although the EA do not have records of any waste management facilities in close proximity to the Upper Levels. Refer to the Mott MacDonald Remediation Strategy (May 2019) for a full review of the history of the site and surrounding area.

The historic landfills recorded within 250m of the site boundary and summarised in previous site reports include:

- Immediately southwest of the site situated on the corner of Laygate Street and West Holborn road. A review by Mott MacDonald states the former South Shields Power Station was operated under a Waste Disposal Licence issued to South Tyneside Borough Council, licensed in 1983 but has since been surrendered. It allowed >250,000 tonnes/year of rock from clay substratum, rubble, cohesive organics and frictional material; and,
- West Dock - immediately adjacent to (and potentially underlying) the West Holborn landfill. The site is closed status, although previously licensed to Aker McNulty in 1997 permitting up to 10,000 tonnes/year of brick, rock, concrete, plaster, construction and demolition waste, slates, tiles, sub/topsoil, sand, clay and shale. The graving docks to the south-west of the site were reportedly infilled during this time.

Asbestos removal and demolition of buildings and structures have historically been carried out on site. A walkover survey undertaken by Lucion in October 2019 identified significant ACMs located at the surface including fly tipped asbestos. See Section 5 and Appendix 1 for further information.

1.4 Site Areas

The site is divided into two distinct areas:

- Lower levels situated in the western region of the site with docks 1, 2, 3 and 4.
- Upper levels situated in the eastern region of the site, running parallel with Commercial Road.

1.5 Ground Conditions - Geology

Please refer to the previous site reports and the Mott MacDonald remediation strategy for detailed geological information observed during the previous site investigations.

2. Project Roles

2.1 Summary Table

A summary of the companies working on the enabling works and their associated roles in terms of design or construction stage are shown in Table 1.

Table 1 Project Roles Relating to the Enabling Works

Project Role	Company	Appointed By
Client	South Tyneside Council	-
NEC/ ECC Project Manager & Quantity Surveyor	Driver Group	South Tyneside Council
Principal Designer (Design Stage)	Mott MacDonald	South Tyneside Council
Asbestos Consultant (Design Stage)	Lucion Environmental / Lucion Consulting	South Tyneside Council
Principal Contractor (Construction Stage)	TBC	South Tyneside Council
Geoenvironmental Engineer (Construction Stage)	TBC	Principal Contractor
Asbestos Removal Contractor(s) - Licensable Work and/or Non-Licensable Work on ACMs (Construction Stage)	TBC	Principal Contractor
Asbestos Consultant (Construction Stage) To be independent of the Asbestos Removal Contractor - Surveying, Sampling, Testing, Air Monitoring (UKAS Accredited) & Verification Reporting.	TBC	Principal Contractor
Other Subcontractors (please insert)		

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3. Previous Site Investigations & Reports: Pertinent Asbestos Information

3.1 Introduction

Previous site investigation reports were made available for review by South Tyneside Council. The previous site investigation reports were produced by CL Associates, Parsons Brinckerhoff, Mott MacDonald, Dunelm and AEG Ltd. A range of contaminants have been identified on-site. A review of the previous reports, specifically relating to asbestos findings, are summarised herein.

In October 2019, Lucion completed an asbestos surface walkover survey and in February 2020 a Licensed Contractor (LC) removed a localised area of fly tipped Asbestos Insulating Board (AIB) and a section of lagged pipe. Also, a limited time was spent hand-picking surface ACMs, predominantly asbestos cement, although a significant amount of scattered debris was noted to remain across the site. Appendix 1 provides a summary table of visible surface ACMs that still remain on site.

A review of pertinent asbestos information from previous site reports is summarised below with Lucion observations and comments shown in italics.

3.2 CL Associates, Ground Investigation and Contamination Assessment, August 2003, 43024/2 and 43024/3.

The investigation was carried out in the western area of the site (Lower Levels) by Soil Mechanics. The investigation included 36No. trial pits and 26No. boreholes. A total of 18No. out of 54No. soil samples were sent to TES Bretby laboratory and 'screened for asbestos using visual examination'. No bulk fibres were reported in the 18No. soil samples analysed.

The CL Associates interpretative report provides a list of potential contaminants that may reside on the site including asbestos from the lagging of pipes, spray asbestos shops for ship fireproofing and fire resistance materials in buildings. *Lucion notes that the subsequent surface walkover and bulk sampling carried out in October 2019 identified asbestos containing materials predominantly including cement debris, mastic, gaskets with one localised fly-tipped area of loose insulating boards and one section of lagged pipe attached to an access ramp wall (AIB and lagging were subsequently removed).*

3.3 Parsons Brinckerhoff Ltd (PB Ltd), Preliminary Risk Assessment, RPT 200732599.1931, March 2008

Photographs of general fly-tipped waste are shown in the report. Figure 4 within the PB report lists asbestos as a potential contaminant identified in previous desk study reports. The report highlights the potential for asbestos contamination in rubble from old buildings.

3.4 Parsons Brinckerhoff Ltd (PB Ltd), Geoenvironmental Assessment, FSE97010A.2098, 2009 (AEG 2008)

Trial pit and window sample locations were completed. A 'significant' amount of suspected surface asbestos contamination was noted in Zones 2, 3 and 4 (Lucion has overlaid the three indicative areas in Figure 2). The types of surface asbestos containing materials noted during the investigation were fragments of gasket, cement, galbestos and composite roof tile(s), although no confirmation of laboratory testing has been viewed by Lucion. Also, a total of 69No. Made Ground samples were scheduled for asbestos laboratory testing with no asbestos detected in the soil samples.

The report suggests that asbestos contamination was confined to the surface, however subsequent site investigations by Dunelm and AEG Ltd in 2018/2019 detected asbestos in soils in both the Upper and Lower Levels. In addition, Lucion carried out a site walkover in October 2019 and identified significant surface ACMs including surface cement debris and occasional gasket; asbestos containing mastic was identified within some wall expansion joints. Subsequently removed from site was a localised area of fly-tipped insulating boards and one section of lagged pipe (attached to the main access ramp).

3.5 Mott MacDonald, Contaminated Land Strategy, Holborn Remediation, March 2016

The revised Site Conceptual Model identified risks posed by contaminated dust from demolition/construction works. The report recommended an additional investigation in areas not previously accessed and to "design a full and meaningful remediation strategy".

The Conceptual Site Model (CSM) proposed some mitigation measures to reduce risks to future site users:

- Risks to vegetation - a suitable capping layer of clean subsoil and topsoil in landscaped and garden areas (BS3882:2007) with a minimum thickness of cover 450mm for grass, 600mm for shrubs and 900mm for trees.
- Risks to future site users from contaminated soils
    - Commercial future site users were considered unlikely to come into contact with potentially contaminated soils, expected to be covered in hardstanding.
    - Residential future site users were considered unlikely to come into contact with soils >1m depth from the final development ground surface. The report anticipated that 1m of topsoil and subsoil will be placed in areas of gardens/landscaping to support plant growth and prevent pathway to future site users. Hardstanding and buildings were considered to reduce the likelihood of future end-users coming into contact with potentially contaminated soils.
- Risks from asbestos to human health - the report recommended specialist advice relating to remediation risks associated with asbestos.

3.6 Mott MacDonald, Contaminated Land Strategy, Holborn Lower Levels, February 2018

The report recommended that all future site Made Ground samples include an asbestos screen/quantification and additional investigation at the site to include a walkover to determine the presence of asbestos at the surface and/or fly-tipped.

3.7 Dunelm Geotechnical and Environmental, Ground Investigation, Factual V.02, D7873, December 2018 (Upper Levels)

The site works were undertaken between February and April 2018 with additional sampling carried out in June 2018. The objectives of the investigation were to determine the ground conditions, the nature of potential contamination, obtain samples for laboratory analysis and carry out environmental monitoring. The intrusive works included 13No. cable percussive boreholes, 34No. trial pits, 4No. trial trenches and 16No. windowless sample locations.

Suspected visual asbestos containing material was recorded at trial pit location MMTP24, which was terminated at 2.70m bgl. A soil sample was collected and sent for laboratory testing although no asbestos was detected. No bulk sample(s) appear to have been collected.

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Ten soil samples were tested positive for asbestos from a total of 153No. soil samples sent for laboratory testing. Appendix 2 provides a summary of the asbestos positive soil samples.

Upon review, the quantification results within the Dunelm report appeared incomplete (Pages 768 and 769). However, the quantification results were subsequently reported in the Mott MacDonald Holborn CLRA 2019 report (20190508), which have been used to complete the Appendix 2 asbestos in soil summary table.

3.8 Allied Exploration & Geotechnics Ltd (AEG Ltd), Final Factual Report Rev.01, March 2019 Rev.01

Holborn Enabling Works Lower Levels and Windmill Hill Ground Investigation.

A ground investigation carried out by AEG Ltd included trial pits, boreholes and hand pits. Within the Western area of the site (Lower Levels) and Windmill Hill a total of 203No. soil samples were tested for asbestos (123 Lower Levels and 80 Windmill Hill).

Lower Levels

- There were 14No. soil (and sediment) samples determined positive for asbestos and one bulk fragment was identified as asbestos cement. Table 1 provides a summary of the samples that were tested positive for asbestos.

Windmill Hill (please note Windmill Hill is outside of the enabling work boundary)

- *There were seven soil samples and one bulk sample (cement) determined positive for asbestos. In trial pit location MMTP205 (log dated 05.09.2018 Windmill Hill area) the AEG Engineer noted possible asbestos in small quantities at 0.70m bgl, the laboratory certificates show soil samples at 0.5m and 1m containing chrysotile in visible cement. Appendix 2 does not include these results as Windmill Hill is not included within the boundary of the enabling works.*

3.9 Mott MacDonald, Holborn CLRA & Remediation Strategy, May 2019

Holborn, South Shields, 20190508, Phase 2 Contaminated Land Risk Assessment and Remediation Strategy, Rev A.

The preferred remediation options outlined in the report is a combination of Options 1 and 3. Option 1 to remove specific point sources off-site and carry out validation sampling. Option 3 to introduce a barrier between future site users and site soils, comprising of the following:

- Hardstanding (e.g buildings, pavements and highways).
- A cover system in landscaped areas (e.g. grassed areas / soft landscaping / residential gardens etc.) to comprise sufficient depth of imported subsoil and topsoil, overlying a physical barrier to discourage excavation, reduce the degree of intermixing of soils and reduce root penetrations. The cover system thickness is to be specified in line with the BRE Guidance for cover systems (March 2004) and consultation with the regulators. A cover system is considered not practical at the enabling works phase and will be installed as part of the development works.

4. Summary of Asbestos Findings from Previous Investigations

4.1 Summary of Previous Soil Sample Analysis

This section summarises the soil previous site investigation(s) sample analysis, for surface ACMs please refer to Section 5.

The ground investigations carried out by Dunelm (2018) and AEG Ltd (2019) reported 24No. out of a total of 276No. soil samples positive for asbestos. The majority of soil samples were determined as 'No Asbestos Detected' (NAD) as were the 18No. and 69No. soil samples reported by CL Associates (2003) and PB Ltd (2009) respectively.

Two soil samples collected in the (Eastern) Upper Levels of the site had concentrations of asbestos in soil greater than 0.1% wt/wt (hazardous waste threshold) at MMTP21 and MMTP36. The asbestos positive soil sample locations and associated GPS coordinates are listed in Appendix 2 and shown in Figure 3. One trial pit location was noted as having suspected visible ACMs noted at MMTP24 (Dunelm 2018), although the associated soil sample was NAD (no bulk samples were tested).

A summary of the asbestos in soil quantification results are provided below (see Appendix 2 for full summary table):

Holborn Eastern Area (Upper Levels)

- The highest asbestos quantification concentrations, above the 0.1% wt/wt hazardous waste threshold, were identified at MMTP36 0.735% wt/wt (1m bgl) and MMTP21 0.173% wt/wt (0.2m bgl).
- The asbestos fibre concentrations detected in soil samples (loose and bundles) ranged between <0.001% wt/wt to 0.019% wt/wt (MMTP36 0.2m).
- MMTP36 (1m bgl), had Loose Fibrous Asbestos Debris (LFAD) detected at 0.395% wt/wt. The total asbestos quantification of the MMTP36 soil sample was 0.735% as it also included asbestos cement and loose fibres.
- The asbestos cement concentrations detected in soil samples ranged between 0.064% wt/wt to 0.276% wt/wt. Maximum concentration at MMTP36 (1m bgl).
- Predominantly chrysotile with trace amosite detected.

Holborn Western Area (Lower Levels)

- The asbestos fibre concentrations detected in soil samples (loose and bundle concentrations) ranged between <0.001% to 0.015%. Maximum concentration at MMQW104 (0.5m bgl).
- Loose Fibrous Asbestos Debris (LFAD) 0.002% to 0.076%. Maximum concentration at MMHP104 (0.10m bgl).
- Predominantly chrysotile and amosite. One sample (MMSS120 0m) where crocidolite was identified at <0.001%.

Windmill Hill

Seven positive asbestos soil samples and one bulk ACM (cement) were identified from 80No. Soil samples tested.

- *Fibre (loose and bundle concentrations) <0.001% to 0.009%. Maximum concentration at MMTP207 (0.20m bgl).*
- *Cement 0.033% to 0.647%. Maximum concentration at MMTP205 (1.00m bgl).*
- *Bulk asbestos cement sample also identified at MMTP205.*

Lucion comment: Given the previous demolition works and historical context of the site, it is likely that incidental visible pieces of ACMs will be encountered in Made Ground during the future earthworks. Therefore, the Principal Contractor must make an allowance and incorporate in the programme for hand picking surface ACMs and to remove visible/observable pieces of ACMs 'as and when' encountered during the earthworks. The Contractor undertaking the work must include the provision of asbestos trained and competent operatives including appropriate Environmental Permits, risk assessment/method statements, control measures and associated validation sampling. Any localised gross asbestos discoveries must be appropriately managed and either treated or removed from the site.

5. Surface ACMs From Previous Walkover Surveys

5.1 Lucion Asbestos Surface Walkover Survey - October 2019 & Subsequent LARC Attendance February 2020 - Holborn Area and Docks 1, 2 and 3

Before Lucion's walkover visit in October 2019, site reports produced by PB Ltd and Mott MacDonald reported the following regarding surface ACMs:

- PB Ltd (RPT January 2009 inc. AEG Factual RPT October 2008. A significant amount of suspected surface asbestos was noted in the eastern (Upper levels) including fragments of gasket, cement, galbestos and composite roof tile(s). For completeness, the three localised areas are shown in Figure 2 appended to this report.
- The Mott MacDonald Remediation Strategy states that during the Dunelm 2018 Upper Levels ground investigation, four surface samples of suspected asbestos were collected by the South Tyneside Asbestos Abatement Officer during the site works and sent to Nichol Associates Ltd, three of the four samples were considered to contain chrysotile asbestos, although the type of ACM is not reported. No laboratory certificates or further information relating to the sampling has been viewed by Lucion.

In October 2019, Lucion carried out a surface walkover survey of the site. A total of 35No. bulk samples were collected and sent for analysis at Lucion's UKAS accredited laboratory. It should be noted that further significant ACMs, predominantly asbestos cement pieces, were visually noted to be scattered across the surface of the site, therefore only representative bulk samples were collected to represent the types of asbestos visually identified.

A total of 29No. out of 35No. bulk samples were tested positive for asbestos including 1No. lagged pipe situated on a retaining wall, a localised area of fly-tipped asbestos insulating board (AIB) and surface debris including cement products, mastic, gaskets, composites and flash guards.

In February 2020, a Licensed Contractor was instructed by the South Tyneside Council to carry out removal works primarily focusing on the licensed ACMs including a lagged pipe (near main access ramp) and AIB fly tipped materials. The status of the surface ACMs following limited removal work are summarised in Appendix 1 and the sample locations are shown in Figure 2.

5.2 Localised Zoned Area Previously Carried Out by Licensed Asbestos Contractor

In February 2020, a Licensed Contractor marked out a test area in Area 008 (refer to Figure 2) where small fragments of ACMs were noted. After carrying out some surface digging in the test area the contractor removed six bags of waste. The test area was located in Area 008, although the exact location within Area 008 is not confirmed.

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6 Licensing Aspects - Asbestos in Soils During Enabling Works

6.1 Site Areas: Upper (Eastern) and Lower (Western) Levels

It is the Principal Contractor's responsibility to determine the Work Category Assessment for their works. Delineation of asbestos contamination has been undertaken using the previous asbestos findings summarised within this report.

Prior to carrying out earthworks, the removal of surface ACMs shall be carried out by suitably trained and competent asbestos operatives who can safely hand pick and remove ACMs for off-site disposal to a licensed waste facility. Refer to Appendix 1 summary table of known surface ACMs identified on-site. Further ACMs will likely be present within vegetated areas and substructures on site

Based on a 'lines of evidence' from previous soil sampling results, Lucion has completed a preliminary assessment regarding the Work Category Assessment for the enabling earthworks. The preliminary assessment has been undertaken using the CL:AIRE Joint Industry Working Group (JIWG) Work Category Decision Support Tool (DST) with output sheets contained in Appendix 3, this assessment is based on known available data and will need revisiting should site conditions vary measurably. Four areas in the vicinity of MMTP36, MMTP26, MMTP21 and MMHP104 are deemed Notifiable-Non Licensed Work (NNLW) with the remaining areas of the site considered as Non Licensed Work (NLW). During the enabling works, there are likely to be additional areas that will require further designation based on the type of ACMs encountered and identified.

The works are likely to comprise a mixture of Non Licensed Work (NLW) and Notifiable Non Licensed Work (NNLW) with any discovered localised Licensable Work (LW) to be managed and carried out by a Licensed Contractor 'as and when' required.

Given that the proposed earthworks will be long term, it would be prudent for the Principal Contractor to notify the project as NNLW, submit the notification form 'ASB NNLW1' to the HSE before the work commences, and zone off areas that are assessed as NNLW. If localised Licenable Works (LW) are encountered during the project, they will need to be managed and notified separately by a Licensed Contractor (ASB5 14 day notification to be submitted to the HSE).

To carry out NLW and NNLW the Principal Contractor's site operatives or their appointed subcontractors must have the necessary asbestos training 'Non-licensable Work with Asbestos Including NNLW (Ref: CL:AIRE asbestos training specific to groundworks) and implement suitable control and protection measures (see Section 9.7). Additional mandatory requirements for NNLW include: ASB NNLW1 notification to the relevant enforcing authority, designated areas, medical examinations and maintain registers of work (health records).

During the enabling works, the Principal Contractor will require the services of appropriately trained and qualified independent asbestos companies including:

- Asbestos Removal Contractor - known visible ACMs are predominantly fragments of asbestos cement, mastic (retaining wall) and gaskets. However, given there is also potential to discover licensable ACMs on site, the Principal Contractor shall make allowance for employing a licensed asbestos contractor, where required, to carry out ACM hand picking to remove visible/ observable ACMs from surface and soils for off-site disposal.
- Asbestos Consultancy - UKAS accredited surveying, air monitoring (PCM & SEM), soil and bulk sampling/testing and consultancy services including verification report.

Sections 8 and 9 of this report include the Principal Contractor scope activities, responsibilities, requirements and allowances specific to asbestos.

6.2 Risk Assessment, Method Statements, Plan of Work & Notifications

The Principal Contractor and their subcontractors who carry out works with asbestos containing soils shall produce their risk assessment and method statement including Plan of Work (PoW) and Work Category Assessment(s) detailing the appropriate control and protection measures, in accordance with CAR SOIL™ guidance and the Control of Asbestos Regulations 2012 (CAR 2012).

The PoW should also include the records of site staff training records/certificates, notifications, induction and toolbox talk registers. Information obtained during the enabling earthworks such as monitoring certificates, laboratory sample certificates and waste consignment/weighbridge notes must be retained and included in a verification report (see Section 9.9).

If additional, unforeseen asbestos contamination (ACMs / soils containing asbestos) are encountered, which potentially have an impact to the project i.e. cost, program or quality/risk, then it will be necessary for the Principal Contractor to inform the Project Manager with clarification of the impact/next steps. Any licensable works must be managed by a Licensed Contractor in line with their PoW and notification requirements.

The Principal Contractor should amend and update the PoW accordingly and carry out (or employ a consultant to act on their behalf) audits and assessments of compliance and efficacy of all working methods.

7. Environmental Agency Correspondence

7.1 Environment Agency Correspondence

In September 2020, following discussions with the Environment Agency, Lucion received the following correspondence from the regional North East Environment Agency Waste Team and Land Contamination Technical Specialist regarding the reuse of asbestos containing soils on site:

"*It is possible for the reuse of some of the existing soil materials that have been impacted by asbestos. If asbestos contaminated materials are visible there will be a requirement for trained specialists to oversee an asbestos watching brief and have measures in place to hand pick observable pieces of asbestos. The soil materials that do not contain visible asbestos fragments and are classified as non-hazardous and are below the asbestos hazardous waste threshold of 0.1% can be reused. It is assumed that these soil materials would be placed beneath appropriate clean cover with a membrane. It is not acceptable for soils containing observable asbestos fragments to be incorporated into the permanent development.*"

"*The soil materials that have been tested and display contamination levels above the hazardous waste threshold are not suitable for reuse under the CLAIRE DoW CoP and should be removed from site and disposed of appropriately using a registered Waste Carrier to a permitted Waste Facility.*"

For clarification purposes, the future development and clean cover specifications fall outside of the enabling works and this report. The future developer(s) will be required to provide the Local Planning Authority with a human health risk assessment and specifications for the final development layout of the site. At present, the future development is understood to include residential and commercial buildings, associated hardstanding and a clean cover placed in areas of residential gardens and soft landscaping. The cover is understood to include hi-vis geotextile and placement of imported clean cover soils.

8. Principal Contractor Enabling Work Asbestos Scope

8.1 Summary of Activities Relating to Asbestos Contamination

The asbestos scope of activities for the Principal Contractor to carry out and create a Finished Landform Profile are shown below. The asbestos scope activities are to be read in conjunction with the Remediation Strategy and associated scope of works produced by Mott MacDonald. Mott MacDonald drawing 368634-MMD-00XXX-DR-C-6031 shows proposed areas of ground for residential end use (green), commercial (blue) and side slopes (orange).

- **Activity 1**: Project setup
- **Activity 2**: Demolition asbestos surveys of structures and substructures
- **Activity 3**: Surface hand picking and removal (Appendix 1 Known Visible Surface ACM Summary Table & Figure 2)
- **Activity 4**: Crushed materials
- **Activity 5**: Target known asbestos in soil areas (Appendix 2 Asbestos in Soil Summary Table & Figure 3)
- **Activity 6**: Gross/unforeseen asbestos discoveries
- **Activity 7**: Main earthworks - soil sampling, excavation, hand picking of ACMs and suitable soil reuse on-site
- **Activity 8**: Drainage/service corridors and roads
- **Activity 9**: Benched side slopes - localised hi vis geotextile and clean cover, refer to Mott MacDonald Holborn Enabling Works Landform drawings
- **Activity 10**: Imported topsoil to be placed at surface in reprofiled commercial area
- **Activity 11**: Imported soils
- **Activity 12**: Supervision, verification and reporting (enabling works only)

Activity 1: Project setup

The Principal Contractor must manage the asbestos risks in accordance with their legal requirements having the necessary training and must prepare appropriate health and safety documentation before carrying out the work, including but not limited to a Plan of Work, risk assessments, method statements, approvals, notifications, licences, consents and environmental permits.

Activity 2: Demolition asbestos surveys of structures and substructures

The Principal Contractor shall instruct a UKAS accredited surveying company to carry out demolition asbestos surveys of existing structures and substructures i.e. retaining walls, foundations, pump chambers, ramps (associated inset rooms and rubble) before demolition work is carried out. The Principal Contractor shall also allow for the appropriate H&S documentation, enable safe access and include allowance for asbestos watching brief(s) during the demolition work. Refer to Activity 4 for the sampling and testing of crushed materials.

Activity 3: Surface ACM hand picking and removal

The ACMs predominantly identified at surface are asbestos cement fragments, although known licensable ACMs have previously been identified and subsequently removed from the site. Refer to Appendix 1 and Figure 2.

Significant scattered visible ACMs, predominantly asbestos cement, have been identified at the surface across the site and are also likely to lie within the shallow soils. Known localised licensable ACMs have previously been identified on-site and were subsequently removed by a licensed contractor.

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Surface ACMs are likely to be present in vegetation areas (previously inaccessible). Therefore when areas of vegetation are cleared further surface hand picking of ACMs will be required. The methods used to remove vegetation on site, should be considered by the Principal Contractor to ensure that the waste is not cross contaminated with ACMs.

Mastics containing asbestos were identified within some wall expansion joints. Where it is not possible to remove all of the mastic ACMs during the surface removal works, they must be removed as part of the demolition work.

It is the Principal Contractor's responsibility to determine the Work Category Assessment for their works to carry out a thorough hand picking exercise across the site to remove visible/observable ACMs for off-site disposal to a licensed waste facility. Given the potential to discover licensable ACMs the Principal Contractor shall make allowance for employing a licensed asbestos contractor, where required.

The Asbestos Contractor carrying out the work must employ suitable control and protection measures and be suitably trained, competent and experienced to undertake the work. They must also produce the necessary risk assessments, method statements, notifications and licences.

We would advise that lockable asbestos waste skip(s) are on-site for double bagged asbestos waste from hand picking operations.

Any grossly contaminated asbestos containing soils requiring disposal must be managed carefully to ensure there is no risk of loss of material, mud or dust between the site and waste facility.

Please refer to Appendix 1 Summary Table - Visible Surface ACMs, identified during Lucion walkover survey, October 2019.

Activity 4: Crushed materials

Following demolition activities and a thorough ACM surface hand pick/removal exercise (Activities 2 and 3), structures, hardstanding and substructures are to be crushed and carried out in accordance with an Environmental Permit. Stockpiles of crushed materials must be sampled to demonstrate their suitability for reuse. Asbestos containing materials shall not knowingly be put through the crusher.

During the breakout of hardstanding and structures, an asbestos watching brief must be present to visually inspect the materials to ensure no asbestos shuttering/other ACMs are processed. It should be noted that mastics containing chrysotile have been identified in wall expansion joints (listed in Appendix 1).

The Principal Contractor shall employ an Asbestos Consultant (Construction Stage) to ensure all crushed materials are suitably screened and tested for asbestos at a minimum of 1 in 100m^3 to confirm the absence of asbestos (No Asbestos Detected (NAD)).

The Principal Contractor shall implement stockpile management procedures to ensure stockpiles are sampled and maintained preventing cross contamination. If laboratory testing returns positive for asbestos, then further segregation, treatment and asbestos quantitative testing shall be undertaken by the Asbestos Consultant (Construction Stage).

Activity 5: Target known asbestos soil areas

Where previous site investigations have identified positive asbestos soil sample locations, an initial minimum 5m by 5m excavation zone shall be set out around each targeted area (refer to Appendix 2 Summary Table - Asbestos in Soil Findings).

Made Ground soils within these areas should be carefully excavated under the supervision of suitably trained asbestos operatives, to the depth of the previous sample point plus an overdig of 0.5m (refer to Appendix 2 for previous asbestos soil sample depths).

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It is the responsibility of the Principal Contractor to instruct a suitably qualified and competent Asbestos Removal Contractor to determine the Work Category Assessment. Hand picking of observable ACMs is required during the excavation of the known targeted asbestos in soil areas to ensure that as far as reasonably practicable all visible ACMs are removed. Very few visible ACMs were noted in borehole and trial pit logs previously carried out by Dunelm (2018) and AEG (2019), however, frequent visible ACMs have been identified at surface/near surface and given laboratory testing has previously detected loose asbestos fibres, loose fibrous asbestos debris (LFAD) and asbestos cement in soils, there is potential to discover licensable ACMs. The Principal Contractor shall make allowance for employing a licensed asbestos contractor, where required.

The Principal Contractor and their Asbestos Removal Contractor carrying out the work shall select a suitable method of hand picking and take into account any potential delays to the programme.

The localised soil arisings shall be placed on heavy duty plastic sheeting/good quality hardstanding to avoid possible cross contamination. Any visible asbestos fragments removed from the localised soils should be double bagged and placed into a secure area for subsequent disposal off-site. Once any visible asbestos fragments have been removed the Asbestos Consultant (Construction Stage) will collect one sample from the stockpiled arisings.

If localised soils are sufficiently contaminated with visible ACMs to warrant further excavation and placement of arisings in a designated picking area, then following picking, confirmatory validation soil samples will be required from the resultant excavation (one from each side wall and one from the base). If the hand picked soils are designated for Dock 4, a minimum of 1No. soil sample per 500m^3 shall be taken from the stockpiled arisings (note: soils proposed to be placed at the Finished Landform Profile Level (FLPL) surface or within the drainage/service corridors will require increased testing compared against the associated asbestos criteria (see Activity 7).

All of the soil samples tested for asbestos shall be sent to a UKAS accredited laboratory for asbestos screen, identification and quantified for asbestos. Please see Activity 7 for suitable soils for reuse on-site. Please note, soils with visible ACMs and /or with quantification concentrations of 0.1% or greater must not be reused on-site, unless further segregation, hand picking and/or delineation can demonstrate otherwise.

During the above works, appropriate control and protection measures must be implemented to mitigate against potential fibre/dust release and inhalation risks to site users and people off-site.

Activity 6: Gross/unforeseen asbestos discoveries

If underlying obstructions, substructures, services or localised burials are encountered and asbestos is confirmed to be present through sampling and testing, the localised area shall be restricted (fenced off with signage) and advice should be sought from the Asbestos Consultant (Construction Stage) and/or Asbestos Removal Contractor. An appropriate strategy shall be developed for the safe removal and disposal of the asbestos containing materials. Before carrying out the removal work, the strategy shall be agreed with the Project Manager.

Activity 7: Main earthworks - soil sampling, excavation, hand picking ACMs and suitable soil reuse on-site

During the main earthworks, the Asbestos Consultant (Construction Stage) shall sample Made Ground soils to test for asbestos (screen, identification and quantification LOD 0.001% wt/wt) in accordance with the sampling densities and asbestos criteria provided below. Laboratory testing shall be carried out at a UKAS accredited laboratory.

Based on the asbestos soil sample results and using a 'lines of evidence' approach, the Finished Landform Profile shall be placed as follows and shown in Illustration 1:

Mott MacDonald drawing 368634-MMD-00XXX-DR-C-6031 shows proposed areas of ground for residential end use (shown as green on the Mott MacDonald drawing) and commercial (blue):

Reprofiled Ground (Proposed Residential End Use Zone)

- **Finished Landform Profile Level: 0 to 100mm (bgl)** shall only include soils with No Asbestos Detected (NAD) - not to be confused as a final development cover system. Given these soils will be used as a temporary surface finish from a 'brownfield source' the asbestos soil testing is to be carried out, during the enabling works, at a minimum of 1No. per 100m^3 with any observable ACMs removed by a suitably asbestos trained and competent contractor.
- **Drainage/service corridors and roads:** shall only include soils with No Asbestos Detected (NAD). Given that the corridors will be excavated by future groundworkers, asbestos soil testing is to be carried out, during the enabling works, at a minimum of 1No. per 100m^3 with any observable ACMs removed by a suitably asbestos trained and competent contractor.
- **100mm to 1,000mm (bgl)** shall include soils containing NAD and asbestos <0.001% wt/wt. Asbestos soil testing is to be carried out during the enabling works at a minimum of 1No. per 500m^3 with any observable ACMs removed by a suitably asbestos trained and competent contractor.
- **Placed in Dock 4: >1,000mm (bgl)** shall include asbestos containing soils ≥0.001% wt/wt to <0.1% wt/wt. Asbestos soil testing is to be carried out during the enabling works at a minimum of 1No. per 500m^3 with any observable ACMs removed by a suitably asbestos trained and competent contractor. Please note, providing asbestos containing soils are utilised first, soils with No Asbestos Detected (NAD) can also be placed within Dock 4. Any additional designated placement areas would require sign off by all stakeholders and regulators.

Reprofiled Ground (Proposed Commercial End Use Zone)

- **Finished Landform Profile Level: 0 - 150mm (bgl)** to act as a temporary cover, the imported topsoil must be free of asbestos (No Asbestos Detected - NAD) and tested in accordance with YALPAG guidance - see Activities 10 and 11.
- **150mm to 250mm (bgl)** shall only include soils with No Asbestos Detected (NAD). The asbestos soil testing is to be carried out, during the enabling works, at a minimum of 1No. per 100m^3 with any observable ACMs removed by a suitably asbestos trained and competent contractor.
- **Drainage/service corridors and roads:** shall only include soils with No Asbestos Detected (NAD). Given that the corridors will be excavated by future groundworkers, asbestos soil testing is to be carried out, during the enabling works, at a minimum of 1No. per 100m^3 with any observable ACMs removed by a suitably asbestos trained and competent contractor.
- **250mm to 1,000mm (bgl)** shall include soils containing NAD and asbestos <0.001% wt/wt. Asbestos soil testing is to be carried out during the enabling works at a minimum of 1No. per 500m^3 with any observable ACMs removed by a suitably asbestos trained and competent contractor.

Prior to placement, a competent Asbestos Consultant (Construction Stage) shall review the asbestos results and associated materials, on behalf of the Principal Contractor. Topographical drawings shall be produced to record the placement and depths of the soils.

Soils/materials with visible ACMs and/or with quantification concentrations of 0.1% or greater shall not be reused on-site, unless further segregation, hand picking and confirmatory asbestos soil testing can demonstrate otherwise

A watching brief and hand picking of observable incidental ACMs is required during the excavation and placement activities to ensure that as far as reasonably practicable all visible ACMs are removed.

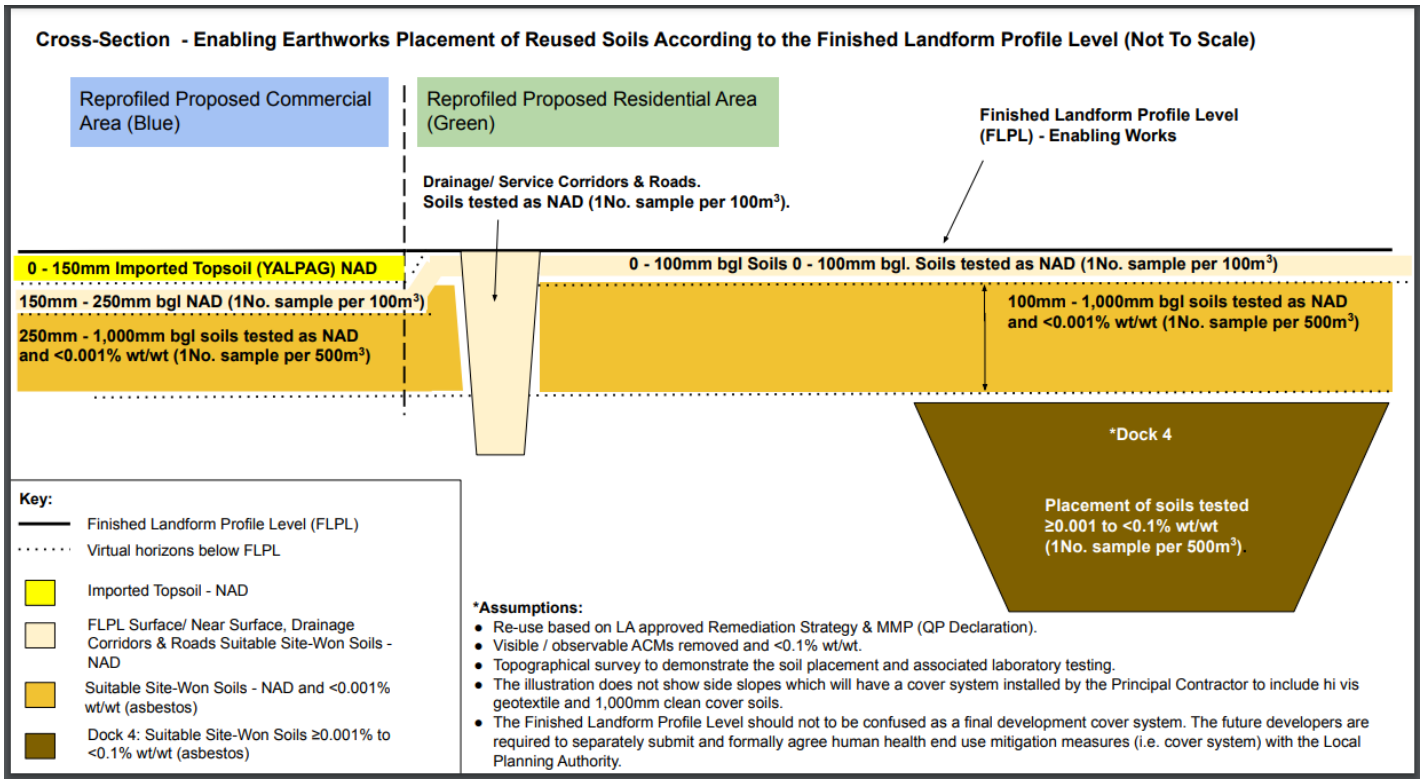
If localised soils are sufficiently contaminated with visible ACMs to warrant further excavation and placement of arisings in a designated picking area, then following picking, confirmatory validation soil samples will be required, if designated for Dock 4 a minimum of 1No. soil sample per 500m^3 to be taken from the stockpiled arisings (note: soils placed at the Finished Landform Profile Level (FLPL) surface or within drainage corridors require increased testing compared against the associated asbestos criteria (see Activity 7). It is the responsibility of the Principal Contractor to instruct a suitably qualified and competent Asbestos Removal Contractor to determine the Work Category Assessment and provide a suitable method of hand picking. The Principal Contractor shall take into account the picking methodology, durations, sampling analysis turnaround time and any potential delays to the programme.

Temporary stockpiling will likely be required to reprofile the site. Details of the proposed stockpiles shall be given in the Material Materials Plan (MMP). The sampling, testing, volume and destinations of the stockpiles shall be recorded in the Verification Report.

See Activity 6 for gross/unexpected asbestos discoveries. During the earthworks, appropriate control and protection measures should be carried out to mitigate potential asbestos fibre and inhalation risks to site users and people in the surrounding off-site areas.

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Illustration 1 Cross Section Placement of Reused Soils - Enabling Earthworks



Please note, Illustration 1 does not show the localised side slopes areas which will have hi vis geotextile and 1,000mm of clean cover soils placed by the Principal Contractor (refer to Activity 9).

Activity 8: Drainage/service corridors and roads

Drainage/ service corridors or roads shall only include soils with No Asbestos detected (NAD). In addition to the drainage drawings produced by Mott MacDonald, a fixed layout plan will be provided by the future developer(s) showing the location of and depths of proposed drainage corridors and roads etc (Figure 4 drawing pending). Given that these corridors will be excavated by future groundworkers, the asbestos soil testing to be carried out during the enabling works shall be at a minimum of 1No. sample per 100m^3 with any observable ACMs removed by a suitably asbestos trained and competent contractor.

Activity 9: Benched side slopes - localised hi vis geotextile and clean cover (refer to Mott MacDonald Holborn Enabling Works Landform drawings)

As part of the enabling earthworks, the Principal Contractor will be required to install a localised cover system to benched side slopes (shown on Mott MacDonald Holborn Enabling Works Landform Earthworks drawings). The benched areas shall have a hi-vis geotextile (orange) installed with a layer of 1,000mm thick 'clean' cover (150mm thick imported topsoil over 850mm thick clean granular material) in order to achieve the Finished Landform Profile Levels (FLPL). The cover system will require asbestos and chemical laboratory testing to be carried out by the Asbestos Consultant/Geoenvironmental Engineer in accordance with contaminant threshold criteria set out by Mott MacDonald and YALPAG Guidance Ref: *Yorkshire and Lincolnshire Pollution*

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Advisory Group (YALPAG), Verification Requirements For Cover Systems, Technical Guidance for Developers, Landowners and Consultants, Version 3.4, November 2017 (or most recent version).

Given that the clean cover proposed on the benched slopes will be Public Open Space for the future development, the cover materials used must be free of asbestos (No Asbestos Detected - NAD). For brownfield / screened source materials 1No. soil sample per 100m^3 shall be tested for asbestos to confirm soils are NAD (No Asbestos Detected).

Activity 10: Imported topsoil to be placed at surface in reprofiled commercial area

Prior to the future development, within the commercial area of the site, a surface it is understood that an additional layer of imported topsoil (i.e. 150mm and grass seeded), will be placed in order to achieve the Finished Landform Profile Level. Refer to Illustration 1. The top soil must be free of asbestos (No Asbestos Detected - NAD) and tested in accordance with YALPAG guidance (see Activity 11 below for further information).

Activity 11: Imported soils

For any Topsoil, Subsoil or other fill material imported onto the site, documentation on its origin should be submitted to the Geoenvironmental Engineer (Construction Stage) and Asbestos Consultant (Construction Stage) for review.

Any imported soils brought to the site must be compliant with the chemical contaminant thresholds specified by Mott MacDonald, if soils are sourced from another site the transfer of soils must have the necessary regulatory sign off i.e. remediation strategy and CL:AIRE Materials Management Plan / Qualified Person declaration.

Soils considered for importation shall be sampled at their source or manufacture location before being imported to the site, in line with the soil sampling densities outlined in YALPAG guidance. All testing for asbestos must be from a UKAS accredited laboratory and the only acceptable criteria is 'No Asbestos Detected or Not Detected'. Any soils detected for asbestos, even if reported as <0.001% are not acceptable for import to the site.

Table 2: Imported Soil Sampling (YALPAG)	
Type	Number of Samples
Virgin Quarried Material	1 or 2 depending on the type of stone utilised, to confirm the inert nature of the material.
Crushed Hardcore, Stone, Brick	Minimum 1 per 1,000m^3.
Greenfield/ Manufactured Soils	Minimum 3 or 1 per 250m^3 (whichever is greater)
Brownfield/ Screened Soils	Minimum 6 or 1 per 100m^3 (whichever is greater)

Activity 12: Supervision, verification and reporting - enabling works only

The Principal Contractor shall instruct an Asbestos Consultant (Construction Stage) to provide site attendance/watching brief, sampling and asbestos laboratory testing during the enabling works to ensure that the asbestos scope of activities are carried out and to provide an independent asbestos verification report. On satisfactory completion of the enabling works, the main verification report is expected to be produced by a competent Geoenvironmental Engineer with the Asbestos Consultant

providing an asbestos verification report to either be appended or issued to the Local Planning Authority separately. Refer to Section 9.9 for further information.

9. Principal Contractor Responsibilities - Asbestos Contamination

9.1 Introduction

The following subsections outline the responsibilities of the Principal Contractor for the associated enabling works. Any demolition required for any remaining above ground structures must be managed with specialist input from asbestos and demolition contractors to ensure asbestos is removed from the site prior to demolition. The summary table of known visible ACMs identified by Lucion in October 2019 (Appendix 1) predominantly identified ACMs at the surface, although asbestos containing mastics were also identified in wall expansion joints. Further (unknown) ACMs are likely to be present in substructures.

9.2 Associated Reports

The Principal Contractor shall review this report along with the following reports and associated documentation:

- CL Associates, Ground Investigation and Contamination Assessment, Factual & Interpretative Reports, RPT's 43024/2 & 43024/3, August 2003.
- Parsons Brinckerhoff Ltd (PB Ltd), Preliminary Risk Assessment, RPT 200732599.1931, March 2008.
- Parsons Brinckerhoff Ltd (PB Ltd), Geoenvironmental Assessment, FSE97010A.2098, January 2009 (AEG 2008).
- Mott MacDonald, Contaminated Land Strategy, Holborn Remediation, 20160331 (Rev A), March 2016.
- Mott MacDonald, Contaminated Land Strategy, Holborn Lower Levels, 20180213, February 2018.
- Dunelm Geotechnical and Environmental, Ground Investigation, D7873, Factual V.02, December 2018 (Upper Levels).
- Allied Exploration & Geotechnics Ltd (AEG Ltd), Holborn Lower Levels and Windmill Hill, Final Factual Report, Rev.01, March 2019.
- Mott MacDonald, Holborn Phase 2 CLRA & Remediation Strategy, 20190508 (Rev A), May 2019.
- Lucion, Land Management Considerations - Surface Asbestos Contamination, 371040, V0, October 2019.
- Lucion, Holborn Enabling Works and Follow on Development - Asbestos Review, Assessment & Management Plan, 357669, Final V0, November 2019.
- Lucion, Holborn, Summary Following Third Party Removal of Surface Asbestos Containing Materials, 412709, V0, May 2020.
- Mott MacDonald NEC4 Contract & Scope Schedule (pending).

9.3 Regulations, Guidance and Legislation

The Principal Contractor shall carry out the works in accordance with the following regulations, guidance and legislation at all times, including, but not limited to:

- The Health and Safety at Work Act 1974.
- The Construction (Design and Management) Regulations 2015 including site specific pre-construction information (PCI).
- The Control of Asbestos Regulations 2012.
- The Control of Substances Hazardous to Health Regulations 2002.

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- CAR-SOIL™, JIWG/CL:AIRE, Control of Asbestos Regulations, Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials, Industry Guidance, 2016.
- CIRIA, Asbestos in soil and made ground: a guide to understanding and managing risks (C733).
- CIRIA, Asbestos in soil and made ground good practice site guide (C765).

9.4 General Requirements & Allowances Specific to Asbestos

The Principal Contractor shall be responsible for providing the following:

- Appropriate insurances to cover work with asbestos containing soils.
- Provision of a CL:AIRE DoW CoP Materials Management Plan (MMP) with a Qualified Person (QP) declaration.
- Provision of CAR-SOIL™ Joint Industry Working Group (JIWG) decision support tool assessments, risk assessments, method statements and Plan of Work (PoW).
- Relevant approvals, licences, consents and Environmental Permits (waste and remediation). Prior to the work commencing, the Principal Contractor shall confirm with the regulatory authorities regarding the Environmental Permit requirements for hand picking ACMs from soils on site. The Principal Contractor shall also take into account and programme in the upfront durations required to obtain the relevant permissions.
- The Principal Contractor shall include allowances for the services of appropriately qualified third party asbestos companies including:

Asbestos Removal Contractor

  - Suitably trained, competent and experienced asbestos contractor. Known surface ACMs are predominantly cement, mastics and gaskets. However, more friable licensable ACMs have previously been identified on site and are likely to be encountered during the enabling works (surface handpicking and soils). Therefore, given the potential to discover further licensable ACMs the Principal Contractor shall make allowance for employing a licensed asbestos contractor where required (CAR 2012 & CAR-SOILTM).
  - H&S documentation, Plan of Work, notification(s), permits and approvals.
  - Asbestos removal from structures and substructures.
  - Site attendance, hand picking and removal of ACMs at surface and also from visibly contaminated Made Ground soils including incidental ACMs, designated hand picking area(s) and management of any gross/unforseen asbestos discoveries.
  - Implementation of suitable control, protection and mitigation measures for handling ACMs and asbestos containing soils including associated plant, equipment and decontamination facilities etc. In accordance with CAR 2012 and CAR-SOIL™ industry guidance.

Asbestos Consultancy (Construction Stage) Including UKAS Accredited Surveying and Analytical

  - Completion of demolition asbestos surveys of existing structures and substructures prior to demolition.
  - Site attendance/ watching brief.
  - Collection of soil and bulk samples for UKAS accredited laboratory testing.
  - Laboratory survey and data review.
  - UKAS accredited air monitoring (asbestos) including efficacy and adherence to the control measures on-site. See Section 9.7.
  - Review test results and survey information.

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- Assist the Principal Contractor and Asbestos Removal Contractor if unexpected asbestos contamination is discovered during the enabling works.
- Liaison with the Geoenvironmental Engineer / Principal Contractor to ensure topographical surveys/drawings track the placement of soils on-site in accordance with the scoped activities and the Finished Landform Profile.
- Produce an asbestos verification report for the enabling works.

Demolition Asbestos Surveys

- The Principal Contractor shall arrange safe access of survey areas and instruct a UKAS accredited asbestos survey company to carry out demolition asbestos surveys of structures and substructures (i.e. retaining walls, existing foundations, pump chambers, ramps etc that require demolition as part of the enabling works.

ACM Removal & Hand Picking

- The Principal Contractor shall instruct an Asbestos Removal Contractor to carry out hand picking of surface ACMs and from soils during the earthworks.
- The Principal Contractor shall select the most appropriate means of removing visible/ observable fragments of ACMs to achieve materials suitable for reuse on-site. The Principal Contractor with assistance from their Asbestos Removal Contractor shall produce method statements/risk assessments and include allowances for potential delays to their programme for hand picking ACM fragments as well as the potential for managing gross asbestos discoveries during the earthworks.

General Earthworks

- The Principal Contractor shall employ suitably competent and asbestos awareness trained supervisors and site operatives to carry out the general earthworks, trained to carry out both Non-Licensed Work (NLW) and Notifiable Non-Licensed Work (NNLW). They shall also ensure that additional NNLW requirements for Notifiable Non Licensed Work (NNLW) are in place i.e. ASB NNLW1 notification, designate area(s), medical examinations and maintain registers of work (health records).
- Establish suitable control, protection and mitigation measures in accordance with CAR 2012 for working with asbestos containing materials and asbestos containing soils.
- Target and sample known asbestos in soil areas identified during previous site investigations (listed in Appendix 2 and shown in Figure 3).
- Stockpile management procedures to ensure that the temporary stockpiles produced during the enabling works are sampled and maintained preventing cross contamination.
- The provision of decontamination facilities (separate to general welfare).
- Asbestos waste removal and consignment notes.
- Appropriate dust suppression equipment and wash down points.
- Fencing (work segregation and signage).
- PPE/RPE equipment (i.e. Category 3 Type 5/6 coveralls and FFP3 respirators).
- Record keeping for inclusion in the health & safety file.

9.5 Laboratory Testing & Turnaround Time

The Principal Contractor shall instruct an Asbestos Consultant (Construction Stage) to be responsible for undertaking all soil and bulk sampling for asbestos testing necessary to satisfy that the works have been carried out in accordance and compliance

with the scope. All bulk and soil samples tested for asbestos shall be carried out by a UKAS accredited laboratory with asbestos soil quantification limits of detection of 0.001% wt/wt.

The Principal Contractor must make allowance for laboratory turnaround times for asbestos results to be analysed and reported (standard laboratory turnaround times approximately 7 working days).

9.6 Incidental Fragments of ACMs & Gross Asbestos Discoveries

As outlined in Activities 4-6, the Principal Contractor and their appointed Asbestos Removal Contractor who are carrying out the work shall select the most appropriate means of achieving soils suitable for reuse on site to include the removal of visible ACMs (i.e. hand picking station or hand picking area) and soils quantified less than 0.1% w/w. The Principal Contractor and their Asbestos Removal Contractor shall provide a Plan of Work including method statements / risk assessments, HSE notifications, licences, consents and environmental permits.

The Principal Contractor shall include allowances for potential delays to their programme for managing visible ACM fragments and gross discoveries during the earthworks. The Principal Contractor shall make allowance for a suitable number of asbestos removal operatives to carry out the hand picking work in accordance with their proposed methods and programme of work.

The Principal Contractor shall allow for incidental hand picking at the point of excavation and placement and select the most appropriate means of hand picking soils that require more detailed picking methods (i.e. hand picking area or picking station) including confirmatory asbestos soil testing following picking (i.e. minimum of 2No. soil samples or 1 per 100m^3 whichever is greater).

Fragments of ACMs that are to be removed by hand require suitably trained, competent and experienced asbestos operatives to undertake the work. Licensed asbestos containing materials must be handled by a Licensed Contractor, who shall provide a Plan of Work, risk assessment and submit the relevant notification(s) to the HSE before carrying out the work.

Appropriate control and protection measures must be implemented during the work to mitigate potential asbestos fibre/ dust release and inhalation risks to site users and people off site in the surrounding areas.

9.7 Control and Protection Measures - Principal Contractor

During the enabling works the following control and protection measures shall be considered and implemented by the Principal Contractor and / or their approved subcontractors.

- **Dust suppression** - the Principal Contractor shall be responsible for maintaining suitable dust suppression of excavation areas, stockpiles and haul roads throughout the works. Mobile water bowsers and / or water atomisers shall be utilised to provide a fine mist to dampen down excavations and stockpiles. Increased dampened down procedures shall be implemented during extended periods of dry weather and above moderate winds (>13mph). The application of water to haul roads, work areas and stockpiles shall be closely monitored to ensure soils are not saturated (potential water runoff).
- **Asbestos air monitoring** - the Principal Contractor shall be responsible for employing an independent UKAS accredited company to carry out asbestos air monitoring including:
    - Regular air monitoring using Phase Contrast Microscopy (PCM) to conduct personal, reassurance and boundary air monitoring whilst working with suspected asbestos containing soil. The frequency at the start of the general earthworks would be expected to be daily (up to 12 air tests per day dependent on weather

conditions), however if asbestos fibres in air are consistently below the limits of detection (evidence based) the frequency may be reduced as the works progress. Assuming the same representative work activities are being carried out, Lucion would typically expect a minimum of three days PCM air monitoring per week. Air monitoring should also be considered on a task specific basis i.e. where the potential risk of fibre release is considered. The PCM air monitoring should be used during the movement/placement of asbestos containing soils including points up/downwind and in the working area. The works will be carried out within the limits of detection of 0.01f/cm^3 as specified within the Control of Asbestos Regulation 2012. The PCM air monitoring shall be in place to validate the methodology by demonstrating that for personal monitoring, with regards to occupational health and safety, the Control Limit of 0.1f/cm^3 is not exceeded and for exposure to be SALI (sporadic and low intensity), the concentration of asbestos in the atmosphere of the breathing zone of workers engaged on work with asbestos should not exceed or be liable to exceed 0.6 f/cm^3 in the air measured over a ten-minute period. Any exposure which exceeds or is liable to exceed this is not SALI. When personal monitoring is conducted it should be carried out over a representative period of time such as a 4 hour shift/task to gain a better representation of the exposure. For reassurance and boundary monitoring a limit of detection of 0.01f/cm^3 for a 480 litre standard test shall be in place (CAR 2012 highlights that this is a transient indication of site cleanliness during works with asbestos).

    - Additional lower limit of detection boundary asbestos air monitoring shall be carried out before and during the enabling works in order to assess for potential fibre release above baseline and to confirm the mitigation measures are effective. Laboratory testing using Scanning Electron Microscopy (SEM) can now achieve UKAS accredited limits of detection to 0.0005f/cm^3. An initial round of boundary monitoring, up and down wind, shall be carried out prior to excavating the ground (used as a baseline), a second round shall be carried out during the excavation of targeted asbestos in soil locations. Further monitoring rounds are to be carried out monthly, however, this may reduce to a minimum of once every two months if there is no indication of asbestos fibre concentrations recorded in air above the baseline levels. Lucion would typically expect a minimum of two SEM tests per round (up and down wind), although additional SEM tests will be required where multiple excavation areas are worked on and/or multiple boundaries require monitoring due to the wind direction.

- **Personal Protective Equipment (PPE) & Respiratory Protective Equipment (RPE)** - the Principal Contractor shall be responsible for ensuring all site staff and operatives have the appropriate PPE/RPE for carrying out work with asbestos containing soils.
- **Decontamination and Designated Areas** - the Principal Contractor shall be responsible for providing decontamination facilities that must be separate to general welfare facilities and, if required, be responsible for providing designated work areas (or respirator zones) with signage.
- **Cleaning of plant and equipment** - the Principal Contractor shall be responsible for ensuring plant, tools and equipment are regularly cleaned and inspected before leaving a designated work area(s) and/or the site.
- **Management of asbestos waste** - the Principal Contractor shall be responsible for ensuring the appropriate packaging, storage and waste classification for asbestos related waste leaving the site, including any contaminated consumables and PPE/RPE. Any wastes removed from site must be taken to an appropriately licensed landfill/or treatment centre.
- **Emergency procedures** (unforeseen/unidentified asbestos) - the Principal Contractor shall be responsible for managing the discovery of unforeseen/unidentified asbestos contamination if discovered at the surface or during excavation works. The contractor shall provide all observations, sample certificates along with the proposed methods, assessments and controls to manage the localised work.

9.8 Topographical Surveying

The Principal Contractor shall be responsible for instructing representative topographical surveying work for the following:

- Interim surveys to be undertaken during the infilling works to provide information on progress, material quantities, stockpile volumes and site levels.
- The location and elevation of sample locations before and after placement.
- Surveying of localised areas where gross asbestos is identified during the earthworks.
- Drainage corridors, placement areas, stockpiles, volumes associated with the testing and material tracking.
- Final plan showing Finished Landform Profile.

9.9 Enabling Work Asbestos Verification Reporting

The Principal Contractor shall instruct an Asbestos Consultant to provide site attendance, sampling and testing during the enabling earthworks to ensure that the asbestos specifications are carried out and to provide an independent asbestos verification report. On satisfactory completion of the enabling works, the main verification report is expected to be produced by a competent Geoenvironmental Engineer with the Asbestos Consultant providing an asbestos verification report to either be appended or issued to the Local Planning Authority separately.

The asbestos verification report shall include, but not limited to, the following:

- A description of the works undertaken and any variations agreed with the regulators.
- Records of the works ie. record sheets including weather conditions, plant, personnel and visitors.
- Progress photographs and notes.
- Laboratory test results (asbestos).
- Asbestos air monitoring certificates.
- Waste transfer/consignment notes.
- Reference to as built surveys including sample locations and associated placement of asbestos containing soils according to the Finished Landform Profile.
- A statement that the works have been undertaken in accordance with the agreed scope and activities.

10. Receptor Ranking

10.1 Finished Landform Profile Level - Construction Workers

Based on the proposed placement of future site-won soils to form a Finished Landform Profile Level (outlined in Activity 7), the overall risk ranking to Construction Worker receptors from near surface soils is assessed as Low; assuming no disturbance activities.

Any future activities to be carried out by future Construction Workers/Developers will need to be suitably risk assessed with the necessary control and protection measures.

10.2 Benched Side Slopes & Localised Cover System - Public Open Space

Localised cover system to include a hi-vis geotextile (orange) and 1,000mm thick ‘clean’ cover layer to achieve the Finished Landform Profile Levels (850mm subsoil and 150mm topsoil).

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Based on a cover system placed on benched sloped areas (shown on Mott MacDonald Holborn Enabling Works Landform Earthworks drawings) the overall risk ranking to Public Open Space Future Site User receptors is assessed as Very Low to Negligible.

11. Future Developer Requirements

This Section is outside of the scope of the enabling work. However, for completeness, the final development will require the future developer(s) to formally submit a human health risk assessment and associated end-use mitigation measures to the Local Planning Authority for approval. At present, the future development is understood to include residential and commercial buildings, associated roads/hardstanding and a clean cover system (hi vis geotextile and clean imported soils) to be placed in areas of soft landscaping and residential gardens.

Prior to the future development, within the commercial area of the site a surface layer of topsoil (i.e. 150mm and grass seeded), will be placed at the Finished Landform Profile Level.

Figure 1 - Site Boundary (Mott MacDonald - Holborn Enabling Works Landform Site Boundaries DWG 368634-MMD-00-XX-DR-C-6000, 19.06.20 P1)



Figure 2 - Surface Asbestos Containing Materials (ACM) Identified During Lucion Asbestos Surface Walkover Survey - October 2019

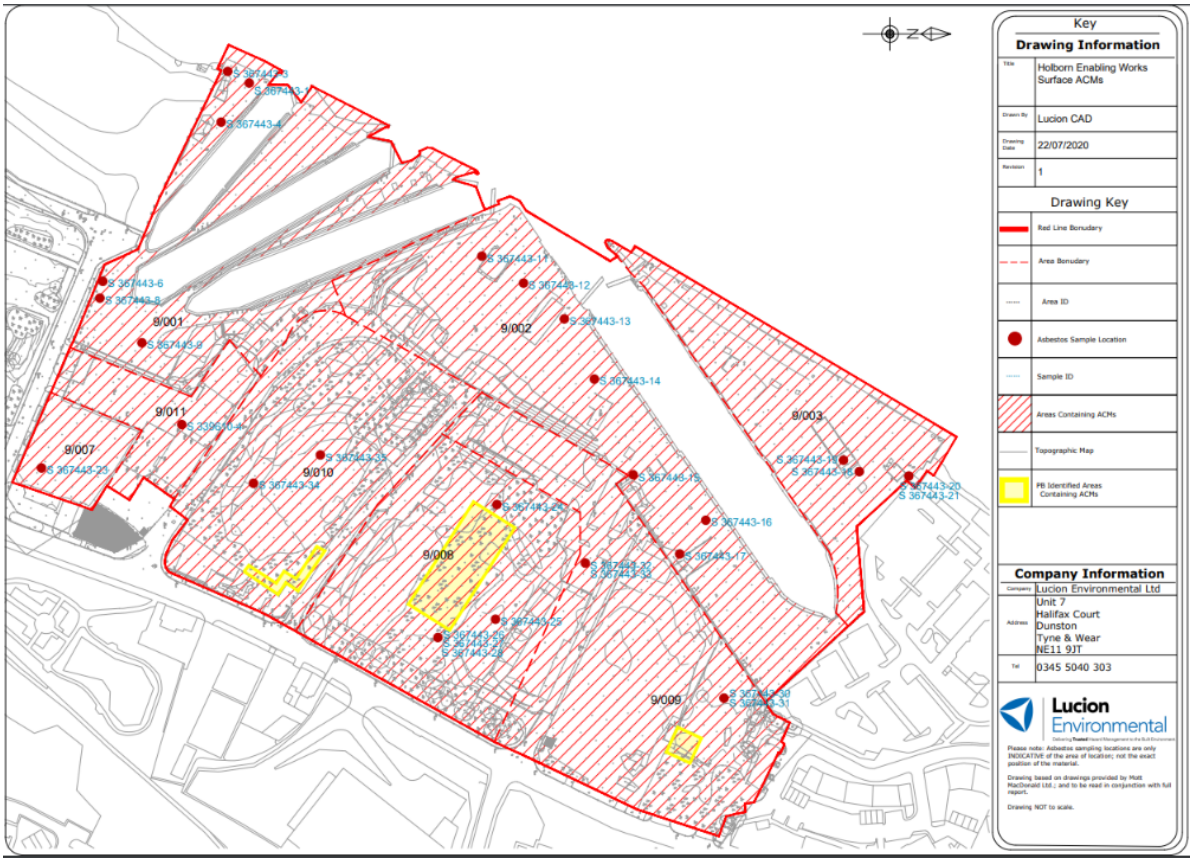


Figure 3 - Asbestos In Soil Locations Identified From Previous Investigations

Note: soil sample locations, depths and GPS coordinates are listed in Appendix 2.

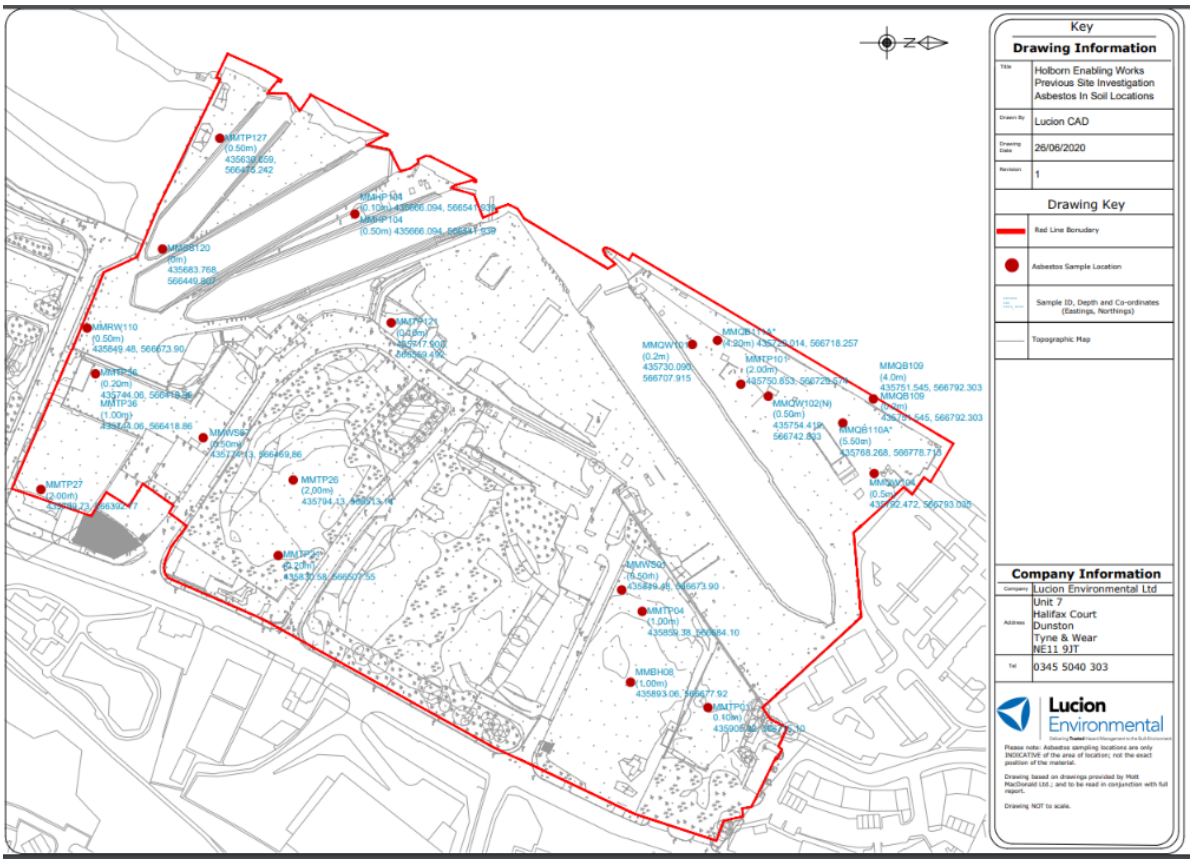


Figure 4 (Pending) Future Developer(s) Layout Plan Showing Drainage / Service Corridors / Roads

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Appendix 1 Summary Table - Known Visible Surface ACMs

Appendix 1 Summary Table - Visible Surface ACMs The initial surface survey carried out by Lucion: LINK 367443 October 2019. Subsequent site attendance by Lucion during (limited) surface asbestos removal by LARC: LINK 392379 and 392119 February 2020.				
Area Location	**Sample No.**	**Item / Product Examined & Material Description**	**Extent Observed During Walkover Survey Report 367443**	**Item Status & Lucion Comments Recorded in Lucion Report 392379:** • **Not removed** • **Part removed** • **Removed as far as practical**
Docks 1, 2 and 3 (Reference Figure 1)				
001/South West-South East dry dock and redundant office area	367443-1	Cement debris south western pier dock slab area (cement chrysotile)	Significant quantity observed in c.100m^3 area.	**Part removed** Visible cement debris collected from the location by two operatives, however not all removed due to the amount of brick rubble and overgrown vegetation (limited access).
001/South West-South East dry dock and redundant office area	367443-6	Mastic to South East and South West boundary wall (composite chrysotile)	80 Lm.	**Not removed** Not included within the scope of works (February 2020).
001/South West-South East dry dock and redundant office area	367443-9	Debris to slab area between boundary walls and dry docks (cement chrysotile)	Significant quantity observed, small pieces of debris scattered throughout c.900m^2.	**Part removed** A significant amount of debris to slab in this location. Two operatives on site collected and bagged up visible debris. Not all debris removed due to the size of the pieces and the amount of surface water.
001/South West-South East dry dock and redundant office area	367443-8	Debris to floor adjacent South West boundary wall (cement chrysotile)	1in x 4in	**Not removed** Unable to locate cement debris due to the amount of surface water (limited access).

001/South West-South East dry dock and redundant office area	367443-4	Debris to slab adjacent South West boundary wall (cement chrysotile)	Small quantity observe, further small pieces throughout area.	**Part removed** Visible cement debris collected and bagged up by two operatives, however, due to the amount of surface water and size of the pieces, not all debris has been removed.
001/South West-South East dry dock and redundant office area	367443-3	Debris adjacent steel door to boundary wall of South West elevation (cement chrysotile)	0.25 m^2	**Removed as far as practical** Cement debris collected from the steel door by the two operatives on site. Item has been removed.
Holborn Area - Upper & Lower Levels (Reference Figure 1)				
002/large area to the right of main access ramp	367443-17	Mastic to boundary wall expansion joints (composite chrysotile)	140 Lm. between 14 joints	**Not removed** Not included within the scope of works (February 2020).
002/large area to the right of main access ramp	367443-14	Debris to slab area adjacent ramp way (cement chrysotile)	Significant quantity observed, small pieces scattered throughout c.1,500m^2 area.	**Part removed** A significant amount of debris to slab in this location. Visible pieces collected and bagged up however not all debris will be removed due to the size of the pieces and the poor weather conditions. Two operatives on site scanning the surface from east to west.
002/large area to the right of main access ramp	367443-16	Debris to floor (cement chrysotile)	Significant quantity observed, small pieces of debris scattered throughout c.2,000m^2 area.	**Part removed** Visible cement debris collected and bagged up by the two operatives on site, not all debris will have been removed as some are situated close to dock wall edge and the sizes of the pieces visible. Item extent has been reassessed since the last inspection. Evidence of cement debris all along the edge amongst the rubble by dock wall, visible debris removed.

002/large area to the right of main access ramp	367443-11	Debris to slab adjacent ramp (cement tiles chrysotile)	Significant quantity observed, small pieces over c.600m^2 area.	**Part removed** Visible cement debris collected and bagged up however due to the size of the pieces, not all will have been removed. Two operatives scanning the surface from east to west.
002/large area to the right of main access ramp	367443-12	Debris to floor around collapsed building (cement chrysotile)	c.250m^2	**Part removed** Cement debris from walls and window panels to the collapsed building. Two operatives on site from LARC removing as much cement debris as reasonably practicable, working from north to south at the location of the collapsed building. Due to the amount of debris in this location not all of it will be removed and only the larger pieces will be bagged up, the contractor states this has been discussed and agreed with Michael Hicks (STC). No access beneath the roof of the collapsed building.
002/large area to the right of main access ramp	367443-12	Debris to slab area adjacent collapsed building (cement chrysotile)	Significant quantity observed, large and small pieces of debris throughout c.600m^2 area.	**Part removed** Visible cement debris collected and bagged up however due to the size of some of the pieces, not all have been removed. Two operatives scanning the surface from east to west.
002/large area to the right of main access ramp	367443-15	Pipe lagging (lagging chrysotile, amosite and crocidolite)	4 Lm	**Removed as far as practical** Lagged pipework section wrapped and cut from the area by LARC 11/02/2020. Before:

				 After removal:  Reassurance air monitoring: <0.01 fibres cm^{-3}.
003/pier adjacent dry dock and river Tyne	367443-20	Flash guards within redundant fuse box (woven chrysotile)	2No.	**Removed as far as practical** Operatives previously removed the fuse box from the wall. Item has been removed
003/pier adjacent dry dock and river Tyne	367443-21	Putty to screw heads within redundant fuse box (composite mastic chrysotile)	4No.	**Removed as far as practical** Operatives previously removed the fuse box from the wall. Item has been removed.
003/pier adjacent dry dock and river Tyne	367443-19	Gasket debris to base of stand alone brick wall (gasket chrysotile)	0.25m^2	**Removed as far as practical** Gasket debris to the base of stand-alone wall collected and bagged up by the two operatives on site. Item has been removed.
003/pier adjacent dry dock and river Tyne	367443-18	Gasket debris to timber sleepers (gasket chrysotile)	Asbestos-containing gasket	**Removed as far as practical** Gasket debris to timber sleepers collected and bagged up by the two operatives on site. Item has been removed.
007/waste land adjacent Trimmers Arms and main road in 9/004	367443-23	Debris to floor (cement chrysotile)	Significant amounts of small pieces scattered	**Part removed** Visible cement debris collected and bagged up from location, however not all debris will have been removed due to the size of the

			throughout c.2,000m^2 area.	pieces and overgrown vegetation. Two operatives on site scanning the location from east to west (limited access).
008/waste land area	367443-28	Debris to ground (gasket chrysotile)	0.25m^2	**Not removed** Unable to locate the gasket debris amongst the land indicated on the site plan.
008/waste land area	367443-27	Corrugated debris to ground (cement chrysotile)	Large amount of small - medium size pieces of asbestos corrugated cement c.400m^2	**Part removed** Corrugated cement debris to the ground. Two LARC operatives on site collecting all visible debris amongst the land area shown on the site plan. Scanning the surface area from West to East and South to North. However, due to the amount of debris and size of some of the pieces, there will be some remaining. Debris is very likely to be buried within the ground as the operatives have previously taken soil samples from a 6×4m area and found the soil to be contaminated.
008/waste land area	367443-26	Tile debris to ground (cement chrysotile)	Large amount of small and medium size pieces of asbestos cement tiles c.400m^2	**Part removed** Cement tile debris to the ground. Two LARC operatives on site collecting all visible debris amongst the land indicated in the site plan. Scanning the surface area from West to East and South to North. Due to the amount of debris and size of some of the pieces, some will remain. Debris is very likely to be buried within the ground as the operatives have previously taken soil samples from a 6×4m area and found the soil to be contaminated.
008/waste land area	367443-25	Debris to ground (cement chrysotile)	Significant amount of small pieces scattered throughout c.8,000m^2 area.	**Part removed** A significant amount of small pieces of debris throughout the area. Visible pieces have been collected and bagged up however it is evident that more tipping has been done in this area, not all debris will have been removed and likely to be buried beneath the surface. Limited access in this

				location due to the tipping waste and poor weather conditions.
008/waste land area	367443-24	Loose boards within dump site (insulating board amosite)	12m^2	**Removed as far as practical** Item removed by LARC on 10.02.2020. Ground following AIB debris removal. Localised area inspected with a satisfactory result. However, caution is advised as there is heavy plant vegetation within adjacent areas where more debris might be located. Before:  After removal:  Reassurance air monitoring: <0.01 fibres cm^{-3}.
009/waste land between council wood chipper area and apartments	367443-29	Debris to dump site (cement chrysotile)	5m^2	**Removed as far as practical** Two operatives on site removing corrugated cement debris from this location.
009/waste land between council wood chipper area and apartments	367443-30	Debris adjacent rabbit burrows (cement chrysotile)	Significant quantity observed, debris found adjacent to rabbit burrows.	**Not removed** Not included within the scope of works (February 2020).

009/waste land between council wood chipper area and apartments	367443-31	Debris to floor adjacent rabbit burrows (gasket chrysotile)	Gasket	**Removed as sample** Not included within the scope of works (Feb 2020).
009/waste land between council wood chipper area and apartments	367443-32	Debris to floor adjacent chipping area (cement crocidolite)	c.70m^2	**Part removed** Visible cement debris collected and bagged up from this location working from north to south, due to the size of the pieces and the poor weather conditions not all of this will be removed.
009/waste land between council wood chipper area and apartments	367443-33	Remains of a car clutch plate (composite chrysotile)	0.25 Lm	**Removed as far as practical** Car clutch plate collected and bagged up by the two operatives on site.
010/waste land and old car park adjacent pub	367443-34	Debris to dump site (cement chrysotile)	Significant amount of small pieces scattered throughout c.140m^2 area.	**Part removed** Cement debris amongst the land. Two operatives on site from LARC collecting and bagging up visible debris amongst land working from South - North, West - East. Debris is very likely to be buried beneath the soil. Limited access throughout overgrown vegetation.
010/waste land and old car park adjacent pub	367443-35	Debris to floor (cement chrysotile)	Significant quantity of small pieces scattered throughout c.10,000m^2 area.	**Part removed** Small pieces of cement debris. Two operatives on site from LARC collecting and bagging up visible debris amongst land, working from South - north and east - west direction. Limited access within the overgrown vegetation areas.
011 Former Glendale Yard - No Access / Reference to Previous Lucion Pre Demolition Survey June 2019 (339610)	NA	Cement debris (chrysotile) Gasket in workshop.	-	**Not removed** Not included within the scope of works (Feb 2020). No access to the area was gained during the initial survey walkover. For completeness, a previous Pre-Demolition Survey was completed by Lucion in 2019.

				The survey identified a gasket within a workshop immersion heater. Cement debris was identified to the garage floor and within a drain gully below a floor hatch. The Pre-Demolition survey noted 'No access' to the rear of the garage building (private land).
*Refer to Lucion survey for areas excluded and not fully accessed during the walkover survey.				
Areas excluded and not fully accessed during the removal visit(s) in February 2020 are detailed below:				
001/South West South East dry dock and redundant office area	Cement debris south western pier dock slab area	Limited access due to the amount of brick rubble and overgrown vegetation.		
001/South WestSouth East dry dock and redundant office area	Debris to floor adjacent South West boundary wall	Unable to locate this due to the amount of surface water, presume still present.		
002/large area to the right of main access ramp	Debris beneath the roof of collapsed building	No access - further investigation required after the roof has been removed in order to gain access.		
002/Collapsed Building Area - undercroft	Entire area	No access within the undercroft which appears to be beneath the collapsed building.		
007/waste land adjacent Trimmers Arms and main road in 9/004	Debris to floor	Limited access - overgrown vegetation.		
008/waste land area	Debris to ground	Limited access in this location due to the tipping waste and poor weather conditions.		

Appendix 2 Summary Table - Known Asbestos in Soil Findings

Appendix 2 Summary Table - Asbestos in Soil Findings
KEY: Highlighted colours are based on the laboratory analysis comments regarding the asbestos material types, shown below.
Loose fibres / bundles of fibres
Cement
Loose fibrous asbestos debris (LFAD)
CL Associates (August 2003). A total of 18No. out of 54No. soil samples were sent to TES Bretby laboratory and 'screened for asbestos using visual examination'. No bulk fibres were determined in the 18No. soil samples analysed.
PB Ltd 2009 (AEG 2008) A 'significant' amount of suspected surface asbestos contamination was noted in Zones 2, 3 and 4 shown in Figure 3 of the PB Ltd report). The types of surface ACMs noted were fragments of gasket, cement, galbestos and composite roof tile(s) - however it is not confirmed if the bulk fragments were laboratory tested. A total of 69No. Made Ground samples were scheduled for asbestos laboratory testing with no asbestos detected in the soil samples.
Dunelm (RPT V.02, December 2018) Upper Levels - The intrusive works included 13No. cable percussive boreholes, 34No. trial pits, 4No. trial trenches and 16No. windowless sample locations. Suspected visual asbestos containing material was recorded at trial pit location MMTP24, terminated at 2.70m bgl, although no asbestos was detected in the associated soil sample. Ten soil samples were tested positive for asbestos from a total of 153No. soil samples sent for laboratory testing (shown below).

Sample ID & Depth	Material Type	Fibre Type	Comment	Quantification (total % w/w)	Site Area	GPS Coordinates Eastings	Northings
MMWS01 (0.50m)	MG grey gravelly sand.	Amosite	Bundle of amosite fibres	<0.001%	Upper Levels	435849.48	566673.90
MMBH08 (1.00m)	MG red brown, gravelly, very silty sand.	Chrysotile	Bundle of chrysotile fibres	0.007%	Upper Levels	435893.06	566677.92
MMTP04 (1.00m)	MG reddish brown sandy gravel.	Chrysotile	Bundle of chrysotile fibres	0.010%	Upper Levels	435859.38	566684.10
MMTP01	MG brown sli	Chrysotile	Bundle of	0.002%	Upper Levels	435905.32	566715.10

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(0.10m)	ashy, sli gravelly sandy topsoil.		chrysotile fibres				
MMTP27 (2.00m)	MG dark brown gravelly sand.	Amosite	Amosite present in small bundle.	<0.001%	Upper Levels	435799.73	566392.77
MMTP36 (0.20m)	MG dark brown / yellow brown ashy gravelly sand.	Chrysotile	Bundles of chrysotile and chrysotile in microscopic cement.	0.064% (fibres 0.019% cement 0.045%)	Upper Levels	435744.06	566418.86
MMTP36 (1.00m)	MG dark brown / yellow brown ashy gravelly sand.	Chrysotile	Chrysotile in microscopic cement and loose fibrous debris and bundles in soil.	Total 0.735% divided into: • Cement 0.276% • LFAD 0.395% • Chrysotile bundles 0.064%	Upper Levels	435744.06	566418.86
MMWS07 (0.50m)	MG dark brown sli ashy gravelly sand.	Chrysotile	Bundle of chrysotile fibres.	0.005%	Upper Levels	435774.13	566469.86
MMTP21 (0.20m)	MG dark brown silty gravelly very sandy topsoil.	Chrysotile	Chrysotile fibres within cement material.	0.173%	Upper Levels	435830.58	566507.55
MMTP26 (2.00m)	MG dark brown sli ashy silty sandy gravel.	Chrysotile	Chrysotile fibres within cement material.	0.078%	Upper Levels	435794.13	566513.14

AEG Ltd (Final Factual Report Rev.01, March 2019) Lower Levels - 14No. soil samples were tested positive for asbestos from a total of 123No. soil samples sent for laboratory testing (shown below).

Sample ID & Depth	Material Type	Fibre Type	Comment	Quantification (total % w/w)	Site Area	GPS Coordinates Eastings	Northings
MMTP101 (2.00m)	MG black and grey very clayey sand and gravel.	Chrysotile	Chrysotile present in microscopic loose fibrous asbestos debris.	0.002%	Lower Levels	435750.853	566729.574
MMQW102(N) (0.50m)	MG black sli clayey sandy	Chrysotile	Small bundle of chrysotile.	<0.001%	Lower Levels	435754.419	566742.833

	gravel.						
MMTP121 (0.10m)	MG light brown yellow sandy gravel.	Amosite	Small bundle of amosite.	<0.001%	Lower Levels	435717.900	566559.492
MMQW104 (0.5m)	MG black sli clayey sli sandy gravel.	Chrysotile	Bundles of chrysotile.	0.015%	Lower Levels	435792.472	566793.035
MMQW101 (0.2m)	MG black clayey very sandy gravel.	Chrysotile	Chrysotile present as fibre bundles.	<0.001%	Lower Levels	435730.090	566707.915
MMQB109 (0.2m)	Black clayey sandy silt.	Amosite	Amosite present as fibre bundles.	0.003%	Lower Levels	435751.545	566792.303
MMQB109 (4.0m)	Black clayey/silty sandy gravel.	Chrysotile	Chrysotile present as fibre bundles.	<0.001%	Lower Levels	435751.545	566792.303
MMHP104 (0.10m)	MG brown gravelly sand.	Amosite	Amosite present in microscopic loose fibrous asbestos debris and as loose bundles.	0.076%	Lower Levels	435666.094	566541.939
MMHP104 (0.50m)	MG brown gravelly sand.	Amosite	Amosite present in microscopic loose fibrous asbestos debris and as loose bundles.	0.008%	Lower Levels	435666.094	566541.939
MMSS120 (0m)	MG grey/ black sli clayey silt	Crocidolite	Small bundle of crocidolite.	<0.001%	Lower Levels	435683.768	566449.807
MMRW110 (0.50m)	MG black and brown sandy gravel.	Chrysotile	Chrysotile present as fibre bundle.	<0.001%	Lower Levels	435721.764	566413.758
MMTP127 (0.50m)	MG brown sli clayey sandy gravel.	Chrysotile	Chrysotile present as fibre bundles.	<0.001%	Lower Levels	435630.659	566475.242
MMQB110A* (5.50m)	MG loose black brown clayey (sediment)	Chrysotile	None provided.	<0.001%	Lower Levels	435768.268	566778.713
MMQB111A*	MG black	Chrysotile	Loose fibrous	0.003%	Lower Levels	435729.014	566718.257

(4.20m)	brown clayey very sandy gravel (sediment)	& amphibole	asbestos debris				
*Sediment sample results sourced from Table 23 Mott MacDonald Phase 2 Contaminated Land Risk Assessment and Remediation Strategy, 7th May 2019. # Windmill Hill samples are not included.							

Appendix 3 Joint Industry Working Group (JIWG) Work Category Assessment Decision Support Tool - Preliminary Assessment Output Sheets

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Lower Levels - Asbestos Fibre Bundles In Soil

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

Project Reference	Holborn Enabling Works (Preliminary Assessment)
Site Name	Holborn, South Tyneside
Client	South Tyneside Council
Run by	Alec Hales
Date	26.10.20
Scenario details	Lower Levels - bundles of fibres in soil, highest concentration 0.015% (MMQW104)

Decision Support Tool for CAR2012 Work Categories

Stage 1
Hazard Factors

		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Free dispersed fibres/fibre bundles	2
Extent of degradation of ACMs at outset of work	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Low quantities - >0.01 to <0.05 %wt/wt	2
Sub-total		12

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

Hazard ranking Medium

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

Stage 2
Exposure Factors

			Score
Anticipated airborne fibre concentration - Control Limit or SALI?	<0.01 fibres/ml		1
Anticipated duration of exposure to asbestos	> 2 hours in a 7 day period and Up to 10 hours in a day (e.g. full time occupational exposure)		4
Activity type and effect on deterioration of ACMs during work	Low intensity, no or minimal deterioration expected		0
Best description of primary host material matrix (soil/made ground)	Coarse to Fine Gravel		3
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Medium		3
Sub-total			11
Exposure ranking			Medium
Combined hazard and exposure ranking		23	Medium

Stage 3
Risk Assessment Outputs

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

*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

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Lower Levels - MMHP104 Loose Fibrous Asbestos Debris (LFAD) In Soil

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

Project Reference	Holborn Enabling Works (Preliminary Assessment)
Site Name	Holborn, South Tyneside
Client	South Tyneside Council
Run by	Alec Hales
Date	26.10.20
Scenario details	Lower Levels - MMHP104 LFAD in soil 0.076% (0.1m) & 0.008% (0.5m)

Decision Support Tool for CAR2012 Work Categories

Stage 1
Hazard Factors

		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Loose fibrous asbestos debris	3
Extent of degradation of ACMs at outset of work	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not firmly linked in a matrix	2
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Moderate quantities - >0.05 to <0.1 %wt/wt	3
Sub-total		12

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

Hazard ranking: Medium

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

Stage 2
Exposure Factors

		Score
Anticipated airborne fibre concentration - Control Limit or SALI?	<0.01 fibres/ml	1
Anticipated duration of exposure to asbestos	> 2 hours in a 7 day period and Up to 10 hours in a day (e.g. full time occupational exposure)	4
Activity type and effect on deterioration of ACMs during work	Low intensity, no or minimal deterioration expected	0
Best description of primary host material matrix (soil/made ground)	Coarse to Fine Sand	2
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Medium	3
Sub-total		10

Exposure ranking: Low

Combined hazard and exposure ranking: 22 — Medium

Stage 3
Risk Assessment Outputs

Probable Licensing Status	Notifiable Non-Licensed Work
RPE*	EN140 with P3 filter half mask
Dust Suppression**	Localised mechanical dust suppression
Hygiene/Decontamination***	Localised and enhanced 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

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Lower Levels - MMTP101 and MMQB111A LFAD In Soil

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

Project Reference	Holborn Enabling Works (Preliminary Assessment)
Site Name	Holborn, South Tyneside
Client	South Tyneside Council
Run by	Alec Hales
Date	26.10.20
Scenario details	Lower Levels - MMTP101 and MMQB111A LFAD 0.002% and 0.003%

Decision Support Tool for CAR2012 Work Categories

Stage 1
Hazard Factors

		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Loose fibrous asbestos debris	3
Extent of degradation of ACMs at outset of work	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not firmly linked in a matrix	2
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Very Low quantities - <0.001 to 0.01 %wt/wt	1
Sub-total		10

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

Hazard ranking: Low

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

Stage 2
Exposure Factors

		Score
Anticipated airborne fibre concentration - Control Limit or SALI?	<0.01 fibres/ml	1
Anticipated duration of exposure to asbestos	> 2 hours in a 7 day period and Up to 10 hours in a day (e.g. full time occupational exposure)	4
Activity type and effect on deterioration of ACMs during work	Low intensity, no or minimal deterioration expected	0
Best description of primary host material matrix (soil/made ground)	Coarse to Fine Gravel	3
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Medium	3
Sub-total		11

Exposure ranking: Medium

Combined hazard and exposure ranking: 21 — Medium

Stage 3
Risk Assessment Outputs

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

*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

DRAFT

Upper Levels - MMTP21 Asbestos Cement In Soil

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

Project Reference	Holborn Enabling Works (Preliminary Assessment)
Site Name	Holborn, South Tyneside
Client	South Tyneside Council
Run by	Alec Hales
Date	26.10.20
Scenario details	Upper Levels - soils containing asbestos cement (micro pieces) at MMTP21 0.173% wt/wt

Decision Support Tool for CAR2012 Work Categories

Stage 1
Hazard Factors

		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Bonded ACMs: cement, vinyl, composites, textured decorative coatings, bitumen products	1
Extent of degradation of ACMs at outset of work	Degraded (Significant degradation in ACM; material has lost its basic integrity)	3
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Non-friable ACM or ACM with fibres firmly linked in a matrix	0
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Large quantities - >0.1 %wt/wt	4
Sub-total		8

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

Hazard ranking Low

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

Stage 2
Exposure Factors

		Score
Anticipated airborne fibre concentration - Control Limit or SALI?	<0.01 fibres/ml	1
Anticipated duration of exposure to asbestos	> 2 hours in a 7 day period and Up to 10 hours in a day (e.g. full time occupational exposure)	4
Activity type and effect on deterioration of ACMs during work	Low intensity, no or minimal deterioration expected	0
Best description of primary host material matrix (soil/made ground)	Coarse to Fine Sand	2
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Very low	1
Sub-total		8

Exposure ranking Low

Combined hazard and exposure ranking 16 Low

Stage 3
Risk Assessment Outputs

Probable Licensing Status	Notifiable Non-Licensed Work
RPE*	EN140 with P3 filter half mask
Dust Suppression**	Localised mechanical dust suppression
Hygiene/Decontamination***	Localised and enhanced 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

DRAFT

Upper Levels - MMTP26 Asbestos Cement In Soil

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

Project Reference	Holborn Enabling Works (Preliminary Assessment)
Site Name	Holborn, South Tyneside
Client	South Tyneside Council
Run by	Alec Hales
Date	26.10.20
Scenario details	Upper Levels - soils containing asbestos cement (micro pieces) MMTP26 0.078% wt/wt

Decision Support Tool for CAR2012 Work Categories

Stage 1
Hazard Factors

		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Bonded ACMs: cement, vinyl, composites, textured decorative coatings, bitumen products	1
Extent of degradation of ACMs at outset of work	Degraded (Significant degradation in ACM; material has lost its basic integrity)	3
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Non-friable ACM or ACM with fibres firmly linked in a matrix	0
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Moderate quantities - >0.05 to <0.1 %wt/wt	3
Sub-total		7

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

Hazard ranking	Low

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

Stage 2
Exposure Factors

		Score
Anticipated airborne fibre concentration - Control Limit or SALI?	<0.01 fibres/ml	1
Anticipated duration of exposure to asbestos	> 2 hours in a 7 day period and Up to 10 hours in a day (e.g. full time occupational exposure)	4
Activity type and effect on deterioration of ACMs during work	Low intensity, no or minimal deterioration expected	0
Best description of primary host material matrix (soil/made ground)	Coarse to Fine Sand	2
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Very low	1
Sub-total		8

Exposure ranking		Low
Combined hazard and exposure ranking	15	Low

Stage 3
Risk Assessment Outputs

Probable Licensing Status	Notifiable Non-Licensed Work
RPE*	EN140 with P3 filter half mask
Dust Suppression**	Localised mechanical dust suppression
Hygiene/Decontamination***	Localised and enhanced 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

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Upper Levels - Asbestos Fibre Bundles In Soil Excluding Location MMTP36

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

Project Reference	Holborn Enabling Works (Preliminary Assessment)
Site Name	Holborn, South Tyneside
Client	South Tyneside Council
Run by	Alec Hales
Date	26.10.20
Scenario details	Upper Levels - soils containing fibre bundles (max 0.010% wt/wt) excluding MMTP36

Decision Support Tool for CAR2012 Work Categories

Stage 1
Hazard Factors

		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Free dispersed fibres/fibre bundles	2
Extent of degradation of ACMs at outset of work	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Very Low quantities - <0.001 to 0.01 %wt/wt	1
Sub-total		11

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

Hazard ranking — Medium

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

Stage 2
Exposure Factors

		Score
Anticipated airborne fibre concentration - Control Limit or SALI?	<0.01 fibres/ml	1
Anticipated duration of exposure to asbestos	> 2 hours in a 7 day period and Up to 10 hours in a day (e.g. full time occupational exposure)	4
Activity type and effect on deterioration of ACMs during work	Low intensity, no or minimal deterioration expected	0
Best description of primary host material matrix (soil/made ground)	Coarse to Fine Sand	2
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Medium	3
Sub-total		10

Exposure ranking — Low

Combined hazard and exposure ranking — 21 — Medium

Stage 3
Risk Assessment Outputs

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

*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

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Upper Levels - MMTP36 Loose Fibrous Asbestos Debris (LFAD) In Soil

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

Project Reference	Holborn Enabling Works (Preliminary Assessment)
Site Name	Holborn, South Tyneside
Client	South Tyneside Council
Run by	Alec Hales
Date	26.10.20
Scenario details	Upper Levels - MMTP36 Loose Fibrous Asbestos Debris (LFAD) 0.395%, plus cement 0.276% and fibre bundles 0.064% (tot 0.735%)

Decision Support Tool for CAR2012 Work Categories

Stage 1
Hazard Factors

		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Loose fibrous asbestos debris	3
Extent of degradation of ACMs at outset of work	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not firmly linked in a matrix	2
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Large quantities - >0.1 %wt/wt	4
Sub-total		13

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

Hazard ranking Medium

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

Stage 2
Exposure Factors

		Score
Anticipated airborne fibre concentration - Control Limit or SALI?	<0.01 fibres/ml	1
Anticipated duration of exposure to asbestos	> 2 hours in a 7 day period and Up to 10 hours in a day (e.g. full time occupational exposure)	4
Activity type and effect on deterioration of ACMs during work	Low intensity, no or minimal deterioration expected	0
Best description of primary host material matrix (soil/made ground)	Coarse to Fine Sand	2
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Medium	3
Sub-total		10

Exposure ranking Low

Combined hazard and exposure ranking 23 Medium

Stage 3
Risk Assessment Outputs

Probable Licensing Status	Notifiable Non-Licensed Work
RPE*	EN140 with P3 filter half mask
Dust Suppression**	Localised mechanical dust suppression
Hygiene/Decontamination***	Localised and enhanced 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

Appendix 4 Joint Industry Working Group (JIWG) Receptor Risk Ranking Decision Support Tool

Construction Workers Upon Finished Landform Profile Level Assuming No Disturbance Activity and <0.001% Soils at Near Surface

Decision Support Tool for Receptor Risk Ranking

Stage 1 Hazard Identification		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Free dispersed fibres/fibre bundles	2
Extent of degradation of ACMs	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Asbestos fibre type	Mainly amphibole and chrysotile mixtures, including trace crocidolite	2
Sub-total		12
Hazard ranking		Medium

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

Stage 2 Emission Factors		Score	
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Trace quantities - <0.0001 to <0.001 %wt/wt	0	
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Very low	1	
Activity type and effect on deterioration of ACMs	No disturbance activity	0	
Best description of primary host material matrix	Coarse to Fine Sand	2	
Sub-total		3	
Exposure ranking			Very Low

Stage 3 Pathway and Receptor Sensitivity		Score	
Receptor category	Construction	No score required	
Age of Receptor	Young adult (>16 and <24)	2	
Duration of exposure/site occupancy	> 1hr <10 hr daily exposure (e.g. part-time to full time occupational exposure or extended daily recreational exposure)	3	
Receptor ranking		5	Medium
Combined hazard, exposure and receptor ranking			Low
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4	
Pathway: Depth to impacted material	Material present near the surface, potential to be disturbed during non-construction/routine use of land	D	
Pathway ranking		4D	Medium
Overall ranking			Low

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Future Public Open Space End Use - Benched Side Slopes With Localised Cover System (Hi-vis Geotextile and 1,000mm)

Decision Support Tool for Receptor Risk Ranking

Stage 1
Hazard Identification

		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Free dispersed fibres/fibre bundles	2
Extent of degradation of ACMs	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Asbestos fibre type	Mainly amphibole and chrysotile mixtures, including trace crocidolite	2
Sub-total		12
Hazard ranking		Medium

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

Stage 2
Emission Factors

		Score
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Trace quantities - <0.0001 to <0.001 %wt/wt	0
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Very low	1
Activity type and effect on deterioration of ACMs	No disturbance activity	0
Best description of primary host material matrix	Coarse to Fine Sand	2
Sub-total		3
Exposure ranking		Very Low

Stage 3
Pathway and Receptor Sensitivity

		Score	
Receptor category	Public open space or building	No score required	
Age of Receptor	Infant (under 5)	4	
Duration of exposure/site occupancy	> 1hr <10 hr daily exposure (e.g. part-time to full time occupational exposure or extended daily recreational exposure)	3	
Receptor ranking		7	High
Combined hazard, exposure and receptor ranking			Medium
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4	
Pathway: Depth to impacted material	Material buried at depth, unlikely to be disturbed except for deeper construction related excavation	B	
Pathway ranking		4B	Very Low
Overall ranking			Very Low