

REMEDIATION METHOD STATEMENT

PHASE 1A AND 1B - ST ANN'S NEW NEIGHBOURHOOD

LONDON

HILL RESIDENTIAL LTD, CATALYST HOUSING AND CATALYST BY DESIGN

RMS-21912J-23-166

OCTOBER 2023

IDOM

The background of the lower half of the page is a blue-tinted photograph of a construction site. It features several large, curved, ribbed structures that appear to be part of a large-scale infrastructure project, possibly a bridge or a large industrial building. The structures are arranged in a series of overlapping, undulating curves. The sky is a clear, pale blue, and the overall scene is captured in a wide-angle shot, emphasizing the scale and curvature of the architecture.

REMEDICATION METHOD STATEMENT
PHASE 1A AND 1B - ST ANN'S NEW NEIGHBOURHOOD
LONDON
HILL RESIDENTIAL LTD, CATALYST HOUSING AND CATALYST BY DESIGN
RMS-21912J-23-166
OCTOBER 2023

Current Document Details

Authors

Rob Glavin

Approved by



.....
S Edwards

Issued by



.....
R Glavin

Document Revisions

Rev	Date	Author	Approved	Issued	Remarks
-	25/04/22	RJG	SJE	RJG	
A	16/05/23	RJG	SJE	RJG	
B	01/06/23	RJG	RJG	RJG	Updated Figure 3.
C	05/10/23	RJG	RJG	RJG	Updated monitoring requirement

Report issued from

KENT 1 Leonard Place, Westerham Road, Keston. BR2 6HQ Tel: 01689 889 980

TABLE OF CONTENTS

REMEDIATION SUMMARY	1
SECTION 1 INTRODUCTION	3
SECTION 2 BACKGROUND	5
2.1 SITE LOCATION	5
SECTION 3 GEO-ENVIRONMENTAL ASSESSMENT SUMMARY	9
3.1 INTRODUCTION	9
3.2 SITE HISTORY	9
3.3 GEO-ENVIRONMENTAL SITE SETTING	9
3.4 GROUND CONDITIONS	9
3.5 CONTAMINATION AND DISTRIBUTION	10
3.6 CONTAMINATION RISKS/CONCEPTUAL MODEL	11
SECTION 4 ZONING OF SOILS FOR REUSE	13
4.2 CHEMICAL DATA	14
4.3 PUBLIC OPEN SPACE:	15
4.4 COMMUNAL GARDENS:	16
4.5 PRIVATE GARDENS:	18
4.6 ZONING EXERCISE	21
SECTION 5 OPTIONS APPRAISAL	25
SECTION 6 DETAILED REMEDIATION STRATEGY	26
6.1 SCOPE	26
6.2 DECOMMISSIONING OF THE RELICT HEATING SYSTEM	26
6.3 CONCRETE SLAB AND SUB SURFACE STRUCTURE REMOVAL	26
6.4 EXCAVATION OF SOILS	27
6.5 GROSS CONTAMINATION	28
6.6 PEACE GARDEN	29
6.7 RETAINED TREES	29
6.8 NEW TREES	29
6.9 SUITABLE SOILS	30
6.10 SPECIFICATIONS FOR SOIL	30
6.11 COMPACTION	33
6.12 BOREHOLE DECOMMISSIONING	34
6.13 DISCOVERY STRATEGY	34
6.14 MANAGEMENT OF POTENTIAL ASBESTOS-CONTAINING MATERIALS	35
6.15 MONITORING	37
6.16 WASTE MANAGEMENT	37
6.17 ENVIRONMENTAL MONITORING, HEALTH AND SAFETY	38
SECTION 7 VALIDATION REPORTING	41
SECTION 8 CONCLUSIONS	42
APPENDIX 1	

- Site Investigation Reports

APPENDIX 2.....

- Zoning Logs and Data

APPENDIX 3.....

- Zoning Plans

REMEDIATION SUMMARY

Remediation is required to render the site suitable for use. In order to minimise the disposal of soils and enhance the suitable reuse of materials the strategy focused upon the retention of soils based upon the proposed uses of the site. Site investigation has been undertaken and a site-specific conceptual model established. The Detailed Remediation Strategy for the site is set out in Section 6 of this report and includes the following measures:

- Decommissioning of the relict heating system;
- Removal of concrete slabs, sub surface structures and relict infrastructure;
- Removal of localised grossly impacted soils;
- Dewatering of contaminated pockets of perched water (if encountered) – shallow groundwater was encountered in the south of the site;
- Provision of suitable soils in areas of soft landscaping over a detour to dig barrier – to be installed as part of the final development; and,
- Provision of upgraded water pipes.

Works will be undertaken in the following order:

1. Vegetation scrape: an initial vegetation scrape is required to remove grass turf and shallow rooted plants. This material will be removed from site.
2. Excavation of soils for reuse: soils will be excavated based upon the zoning exercise (See Section 4 and the plans in Appendix 3) and stockpiled for reuse. Soils must be carefully managed and will be sorted into the following categories based upon their physical and chemical properties.
 - a. Subsoil suitable for use in the extension of the Peace Garden.
 - b. Subsoil suitable for retention in communal landscaped areas.
 - c. Subsoil suitable for use beneath private gardens.
 - d. General fill (to be used below roads, buildings, hardstanding and as backfill to remedial excavations).
 - e. Unsuitable soils.

A plan showing these areas is included as Figure 3.

3. Site won soils will not be suitable for use as topsoil and suitable material must be imported. Site won soils will be placed into small stockpiles to prevent cross contamination or losses and subject to laboratory testing to confirm suitability for use. Careful excavation and management of soils will be key to ensuring the maximum potential for reuse and minimising disposal.

4. The remedial strategy requires clean cover in all newly formed areas of soft landscaping to comprise 600 mm suitable soil over a deterring barrier in private gardens and 300 mm in communal landscaping. This can include site won subsoil.
5. Once the existing soils have been excavated and stockpiled demolition works can commence. Specialist Contractors will undertake the following tasks:
 - Removal of concrete slabs, sub surface structures and relict infrastructure;
 - Removal of localised grossly impacted soils; and
 - Dewatering of contaminated pockets of perched water (if encountered) – shallow groundwater was encountered in the south of the site.
6. Excavations will be reinstated and compacted in accordance with the criteria set out in Section 6.11.
7. Upgraded water pipes and the clean cover system will be incorporated as part of the development works and on a phased basis.
8. All works must be Validated and approved by the Local Environmental Health Officer and the Environment Agency.

SECTION 1 INTRODUCTION

1.1 Hill Residential Ltd, Catalyst Housing Ltd and Catalyst by Design Ltd proposes to develop an area of land located at the former St Ann's Hospital, London for residential development purposes.

1.2 Description of the development:

The change of use, conversion and alteration of seven existing hospital buildings within Phase 1A for a flexible range of uses (Use Class E, F1 / F2);

The demolition of some existing buildings (in accordance with the demolition plan);

The erection of new buildings for residential uses (Use Class C3); and

Alterations to the existing access road and installation of new vehicular, pedestrian and cycle accesses; landscaping including enlargement of the Peace Garden, associated car and cycle parking spaces and servicing spaces.

The demolition of existing buildings and structures in Phases 1B, 2 and 3 (in accordance with the demolition plan);

Outline planning (all matters reserved except access) for Phases 1B, 2 and 3 for:

The erection of new buildings for residential development (Use Class C3), commercial business and service (Use Class E), and local community and learning (Use Class F1/F2); and

Associated pedestrian and cycle accesses; landscaping including enhancements to the St Ann's Hospital Wood and Tottenham Railsides Site of Importance for Nature Conservation (SINC) car and cycle parking spaces and servicing spaces.

1.3 This report relates only to Phases 1A and 1B.

1.4 Ground investigation, contamination risk assessment and an initial remedial appraisal have been undertaken, as listed below:

CAPITA; St Ann's Hospital, London – Due Diligence Report: Ground Conditions (ref: CS/094972), dated February 2018;

RSK; St Ann's Hospital, London: Preliminary Risk Assessment (ref: 29356-R02 (00), dated October 2017.

IDOM Merebrook Ltd.: Contaminated Land Assessment, St Ann's New Neighbourhood. Ref: CLA-21914J-22-151. Dated: May 2022.

1.5 The previous reports, specifically the IDOM Merebrook Ltd Contaminated Land Assessment also incorporate a Phase 1 Desk Study.

- 1.6 This *Remedial Method Statement* provides a summary of the earlier data and sets out details regarding the remediation methods, validation techniques / requirements and environmental controls to be applied during the development works in Phase 1A and Phase 1B.
- 1.7 In addition, this report sets out an inspection and sampling strategy to be adhered to following demolition of the existing buildings in Phases 1A and 1B.
- 1.8 The objectives of this report are therefore to:
- Summarise the contamination present at the site and the associated risks;
 - Provide a method statement for a supplementary site inspection following demolition;
 - Present the details of a remedial strategy for the site;
 - Set out the validation procedures and techniques to be employed to ensure that the remedial works are effective;
 - Set out the required acceptance criteria for site-derived soils and imported soils;
 - Identify soil resources and suitable future uses within the proposed development;
 - Set out soil waste identification and disposal protocols; and
 - Summarise the environmental controls to be implemented during the works to manage contamination issues.
- 1.9 This report has been prepared for Hill Residential Ltd, Catalyst Housing Ltd and Catalyst by Design Ltd for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult Hill Residential Ltd, Catalyst Housing Ltd and Catalyst by Design Ltd and IDOM as to the extent to which the findings may be appropriate for their use.

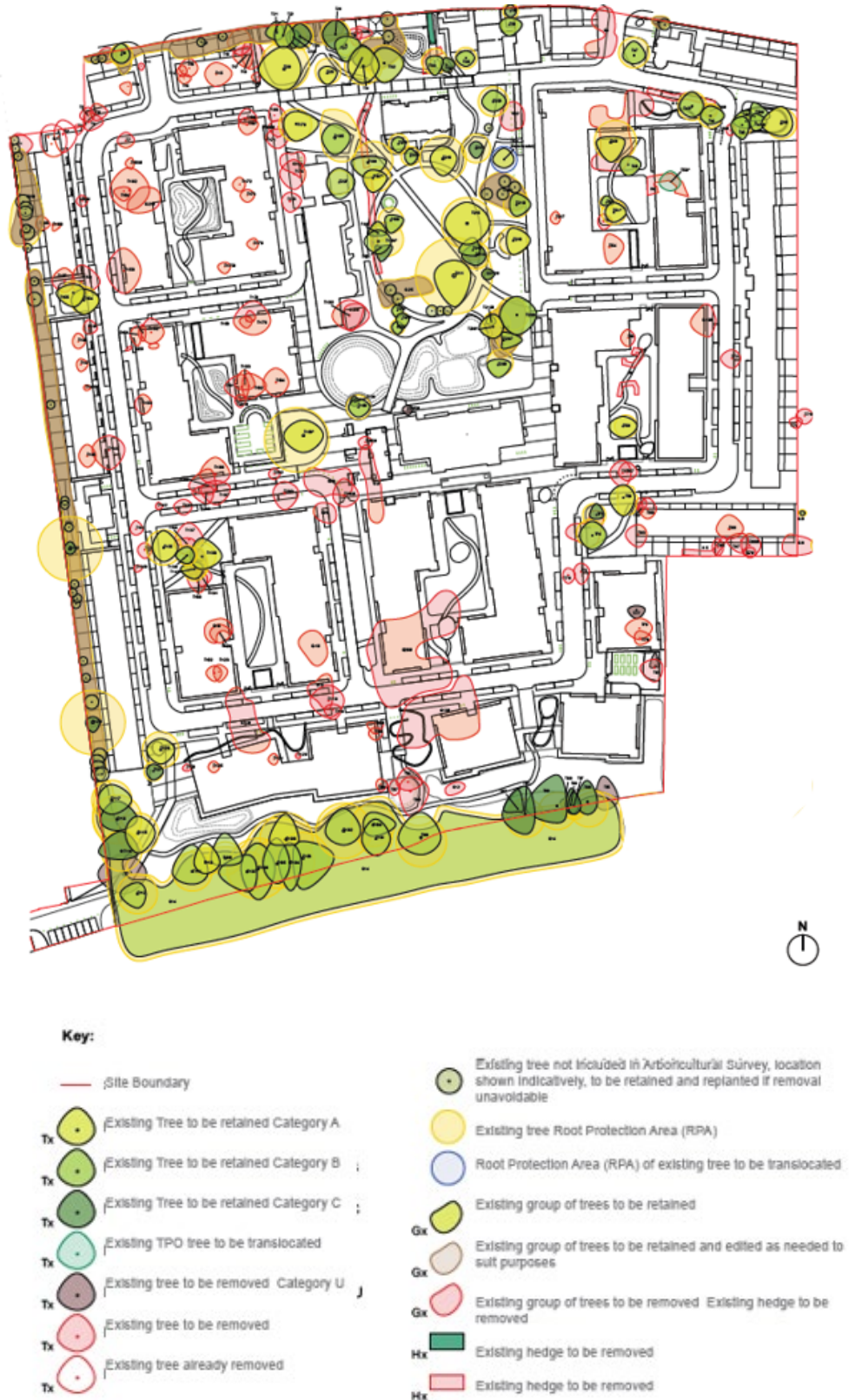
SECTION 2 BACKGROUND**2.1 SITE LOCATION**

- 2.1.1 The site is located at National Grid Reference 532589, 188605 and indicated on drawing 21914J-304-001, presented in the Contaminated Land Assessment, which is included as Appendix 1 of this report.
- 2.1.2 The site is located within the administrative boundary of the London Borough of Haringey and occupies a 7.2-hectare parcel, formerly part of the St Ann's Hospital complex. The buildings, the majority of which are no longer in active use, vary in styles from pre-war to refurbished post-war buildings. Building heights across the site range from 2-3 storeys.
- 2.1.3 Vehicular and pedestrian access to the site is via St Ann's Road (N15 3TH).
- 2.1.4 The Phase 1A and 1B development area include an area of public open space/parkland known as the Peace Garden as well as low-rise hospital buildings and related infrastructure. There are also other areas of soft landscaping (and a wooded area to the south) which incorporates trees with Tree Protection Orders (TPOs).
- 2.1.5 Phases 1A and 1B of the development are illustrated by Figure 1. Figure 2 presents a plan showing the trees to be retained on site.

Figure 1: Development Phases:



Figure 2: Retained Trees



- 2.1.6 A tank farm containing three above ground tanks (within a brick/concrete bund) was located in the south it is understood that fuel lines run from the tank farm to the boiler room. An engineer's workshop was also located in the south of Phase 1b. Two electricity substations were located towards the middle of the area.
- 2.1.7 The site was predominantly flat with a general slope from west to east and north to south.
- 2.1.8 The site is bound by St Ann's Road to the north with Chestnuts Park and residential properties beyond. To the east is a further parcel of St Ann's Hospital which is undergoing redevelopment and hospital buildings that are still in use. To the south is an overground railway line with residential housing and the Arena Design Centre beyond. To the west the site is bounded by Warwick Gardens with residential housing beyond.
- 2.1.9 Tunnels, ducts and basements constructed as part of the hospitals service network are known to contain asbestos.

SECTION 3 GEO-ENVIRONMENTAL ASSESSMENT SUMMARY**3.1 INTRODUCTION**

- 3.1.1 This section provides a brief summary of the various stages of geo-environmental assessment which have been undertaken for the site.

3.2 SITE HISTORY

- 3.2.1 The site was predominately farmland (with only a few buildings in the north) until the 1890s when a hospital was built on the site. The site has remained as a hospital with the addition of extensions and new buildings.
- 3.2.2 Permanent buildings within Phase 1A and 1B included an administrative block and water tower. A boiler house was added in 1907. The above ground fuel storage tanks in the south of the site were installed in the 1960s. An electricity substation was noted by the 1970s and a second from the 1980s (both were noted towards the middle of the site).

3.3 GEO-ENVIRONMENTAL SITE SETTING

- 3.3.1 The published geological map indicates that the site is underlain by the solid geology consists of the London Clay Formation.
- 3.3.2 The London Clay Formation is classified by the Environment Agency as an Unproductive Stratum.
- 3.3.3 The nearest surface water feature is the New River, located approximately 500 m to the south of site.
- 3.3.4 The site is within Flood Zone 1 as defined by the Environment Agency. This means it has a low probability of flooding from rivers and the sea.

3.4 GROUND CONDITIONS

- 3.4.1 A copy of the existing reports are included as Appendix 1.
- 3.4.2 The encountered ground conditions were made ground over London Clay which is consistent with the published geology.
- 3.4.3 A summary of the ground conditions encountered is presented in Table 1, whilst a more detailed assessment of the strata is contained in the following sections of the report.

Table 1: Summary of Sub-surface Ground Conditions

STRATA	DEPTH TO TOP RANGE (m bgl)	THICKNESS RANGE (m)
Topsoil	0.0	0.1 – 0.4
Made Ground: Bituminous surfacing	0.0	0.15
Made Ground: Total	0.0 – 0.4	0.1 – 1.4
London Clay	0.1 – 1.4	2.0+

3.4.4 Topsoil

3.4.4.1 Topsoil generally comprised soft brown slightly sandy clay with rootlets.

3.4.5 Made Ground

3.4.5.1 Made ground was encountered at each investigation location and generally comprised sandy clay to gravelly sand/sandy gravel with inclusions of concrete, brick, flint, glass, clinker, ceramic fragments, ash mudstone and sandstone.

3.4.5.2 Locally fragments of potentially asbestos containing materials, as well as ash and clinker.

3.4.5.3 Hydrocarbon odours were reported in soils close the boiler tanks.

3.4.5.4 Concrete obstructions were identified at a number of locations.

3.4.6 Natural Ground

3.4.6.1 The London Clay generally comprised firm to stiff light brown silty sandy clay to greyish brown silty clay.

3.5 CONTAMINATION AND DISTRIBUTION

3.5.1 The investigations demonstrate that the former uses of the site have resulted in contamination (principally within made ground) by metals, PAH compounds and asbestos. PAH contamination was also encountered in samples of topsoil and a sample of natural clay was impacted by heavy metals (lead and arsenic).

3.5.2 The heating network across the site included tunnels and ducts that connected to the boiler house. A demolition survey carried out by Eton Environmental (a copy of which is appended to the Contaminated Land Assessment included as Appendix 1) of the heating system identified asbestos including hard set lagging in the tunnels, ducts and basements across the site.

3.5.3 Given the age of the buildings at the site it is likely that asbestos would be present in these structures. It is unclear if an asbestos survey (other than the heating system) has been carried out. Asbestos surveys of all onsite structures prior to demolition is recommended.

3.5.4 Slightly elevated PID readings were also recorded in the vicinity of the boiler house. In addition, perched groundwater within the London Clay in the vicinity of the boiler house was contaminated by PAH compounds.

3.5.4.1 Ground gas monitoring indicates that gas and vapour protection measures are not required.

3.6 CONTAMINATION RISKS/CONCEPTUAL MODEL

3.6.1 Following completion of phases 1 and 2 of the investigation and a qualitative risk assessment, the conceptual model for the site, with relation to pollutant linkages, has been updated. The conceptual model is presented in Table 2 below.

Table 2: Conceptual Model

POSSIBLE POLLUTANT LINKAGE			RISK CHARACTERISATION
POTENTIAL SOURCES	PATHWAYS	RECEPTORS	
Heavy metals and hydrocarbons (made ground)	Contact with contaminated soil	Human health (current users)	Low risk identified Made ground is impacted by several forms of contamination. However, the site has few current site users.
	Ingestion and inhalation of contaminated soil and dust	Human health (current users)	
Heavy metals and hydrocarbons (made ground)	Contact with contaminated soil	Human health (future residents and construction workers)	Moderate risk identified Contamination of made ground soils metals, PAH and asbestos. Mitigation measures will be required in the limited areas of soft landscaping. Outside of these areas buildings and hardstanding will sever potential pathways.
	Ingestion and inhalation of contaminated soil and dust	Human health (future residents and construction workers)	
Asbestos (made ground and structures)	Ingestion and inhalation of contaminated soil and dust	Human health (future residents and construction workers)	Moderate to high risk identified A significant number of asbestos detections (fibres and fragments) were reported across the site. Asbestos lagging is present in the subsurface heating system and probably in onsite buildings.
Radiation (medical sources)	Contact with source or contaminated material	Human health (future residents and construction workers)	Low risk The radiation used represents a closed source - this will have been removed from site.
Contamination (all forms)	Vertical migration to aquifer	Controlled waters	Low risk identified Limited shallow groundwater has been encountered and a significant thickness of London Clay acts as an aquitard to the aquifer at depth.
Contamination (all forms)	Horizontal migration to surface water	Controlled waters	Low risk identified Nearest surface water feature is significantly distant.
Hydrocarbons	Direct contact	Plastic water pipes	Moderate risk identified Significant PAH contamination presents a risk to permeable services.
Hazardous Gas/Vapours In soil	Ingress into buildings and voids	Human health (future residents and construction workers)	Low risk identified Based on the available data, the ground gas regime is considered to be Green (low risk).

POSSIBLE POLLUTANT LINKAGE			RISK CHARACTERISATION
POTENTIAL SOURCES	PATHWAYS	RECEPTORS	
Phytotoxic metals	Direct contact/root uptake	Ornamental planting	Low risk identified Concentrations of zinc were encountered above the applicable criteria in four samples. However, healthy plant growth was noted, indicating that the contamination is of limited bio-accessibility. The provision of clean cover will provide a proficient growth medium.
Adjacent Land	Horizontal migration of groundwater/gas.	Neighbouring properties	Low risk identified The available data indicates a low risk.

SECTION 4 ZONING OF SOILS FOR REUSE

- 4.1.1 Based upon the remedial requirements and chemical data it was considered possible that soils could be retained on site for reuse. Specific consideration was given to the Peace Garden, which is to be retained and expanded.
- 4.1.2 Remedial measures must be sensitive to the existing Peace Garden and trees to be retained. As a result, a contamination zoning exercise was undertaken to identify the risks from shallow soils.
- 4.1.3 The zoning exercise was required to satisfy three principal requirements:
- i.* The Planning Conditions require a “Circular Economy” with minimal wastes going off site. The zoning will enable an understanding of suitable soils that can be reused and the circumstances under which it can be reused.
 - ii.* Secondly, the zoning will inform the remediation strategy and reuse of soils on site. Simply excavating all of the soils and placing into one stockpile for treatment could result in a significant volume of unsuitable material. The zoning exercise has the potential to make significant cost savings and enable targeted excavation with soils placed into three categories: soils that can be reused without treatment; soils that require processing and unsuitable material.
 - iii.* To satisfy the requirements of the Landscape Architects to demonstrate that only minimal remediation is required in areas of retained landscaping and trees.
- 4.1.4 The zoning exercise included the following scope of work within the Phase 1a and Phase 1b:
- i.* Excavation of 73 hand-dug investigation pits to approximately 600 mm below ground level (bgl);
 - ii.* Laboratory chemical soil testing of 98 soil samples; and
 - iii.* Analysis of fragments of potentially asbestos containing material encountered during the investigation.
- 4.1.5 Hand-pits were excavated using hand tools. Logs and data are included as Appendix 2. Plans showing the site investigation locations are included as Appendix 3.
- 4.1.6 Ground conditions generally comprised varying thickness of topsoil underlain by made ground, which in turn overlay the London Clay Formation. Exploratory hole logs are enclosed with this letter and contain full details of the observed conditions.
- 4.1.7 Where encountered, topsoil was identified to depths of between 0.05 and 0.2 m bgl, but was generally less than 0.1 metres thick. The topsoil typically comprised grass

covered, dark brown silt or clay with gravel inclusions of rootlets, flint, brick, and chalk. Occasional fragments of slate, wood, coal, and bark were also observed in some locations. No organoleptic evidence of contamination was recorded in the topsoil.

- 4.1.8 Made ground was encountered in all investigated locations and was variable in appearance. Made ground was typically encountered as brown or dark brown clay or silt. Inclusions of brick, flint, concrete, coal, clinker, roots, slate, porcelain, plastic and polystyrene were recorded throughout the made ground.
- 4.1.9 The made ground at two locations, MHP130 and MHP142 were noted to contain a high proportion of coal.
- 4.1.10 Reworked London Clay containing fragments of coal, flint and brick was also noted within a number of site investigation locations.
- 4.1.11 Slow water ingress was recorded at MHP127 and MHP165 in the west of the site.
- 4.1.12 Potentially Asbestos Containing Material (ACM) was identified during the investigation within MHP123 (0.1 m) and MHP161 (0.1 m).
- 4.1.13 Visual or olfactory evidence of hydrocarbon contamination was not observed within the made ground.
- 4.1.14 Weathered London Clay Formation was typically encountered at depths ranging from 0.4 – 0.6 m bgl. However, across parts of the site, typically in the north, the made ground extended to depths of greater than 0.6 m. The weathered London Clay was encountered as a soft to stiff, brown, slightly mottled orange, silty clay. No visual or olfactory evidence of contamination was recorded in the London Clay.

4.2 **CHEMICAL DATA**

- 4.2.1 A total of 98 soil samples were submitted to the laboratory for chemical analysis, including two samples from natural ground, twelve from topsoil and 84 samples from made ground. The laboratory chemical analysis certificates are enclosed with this letter.
- 4.2.2 An initial screening exercise has been undertaken whereby contaminant concentrations recorded in soils have been assessed against Suitable for Use Levels (S4ULs) published in 2015 by LQM/CIEH. These precautionary screening levels are designed to be representative of minimal risk to human health in a number of land use scenarios.
- 4.2.3 As part of the proposed development, three land use scenarios have been identified:
 - i.* Residential Properties with Private Gardens.
 - ii.* Residential Properties with Communal Gardens.
 - iii.* Areas of Public Open Space.

- 4.2.4 To understand where soils can be reused on site the entire data set was screened against screening values for each of these land-use scenarios. It should also be noted that the Peace Garden in the northern portion of the site will remain in its current use.
- 4.2.5 Public open space, specifically the Peace Garden will be maintained and managed to be used by the general public and not just residents of the proposed development. It will be used as a place of reflection and significant tree planting is proposed. As such the potential for contamination track-back is considered to be negligible and screening values for POS Park are considered appropriate. Other areas of open space around the development offer amenity to the associated properties and will be compared to the screening values relevant to residential properties.
- 4.2.6 It should also be noted that for much of the site, once the vegetation and root zone has been removed, there will be little or no residual topsoil.
- 4.2.7 Soil chemical results were processed and compared with each of the above screening levels to determine the suitability for use in each area.

4.3 PUBLIC OPEN SPACE:

- 4.3.1 Samples with contaminant concentrations in excess of the screening criteria are set out in Table 3 below.

Table 3: Exceedances of POS Park screening levels within the analysed soil samples.

Determinand	Number of exceedances	Soil sample in exceedance of POS Park screening levels
Asbestos	3	MHP112 (0.5 m), MHP123 (0.15 m), MHP161 (0.1 m).
Lead	2	MHP104 (0.5 m), MHP146 (0.2 m).
Benzo(a)anthracene	4	MHP126 (0.1 m), MHP130 (0.15 m), MHP145 (0.1 m), MHP152 (0.4 m).
Chrysene	2	MHP145 (0.1 m), MHP152 (0.4 m).
Benzo(b)fluoranthene	6	MHP126 (0.1 m), MHP130 (0.15 m), MHP145 (0.1 m), MHP152 (0.4 m), MHP155 (0.4 m), MHP162 (0.2 m).
Benzo(a)pyrene	6	MHP126 (0.1 m), MHP130 (0.15 m), MHP145 (0.1 m), MHP152 (0.4 m), MHP155 (0.4 m), MHP162 (0.2 m).
Dibenzo(a,h)anthracene	9	MHP126 (0.1 m), MHP130 (0.15 m), MHP144 (0.5 m), MHP145 (0.1 m), MHP145 (0.6 m), MHP152 (0.4 m), MHP155 (0.4 m), MHP167 (0.1 m), MHP167 (0.3 m).

- 4.3.2 Asbestos fibres were identified within three soil samples, bulk asbestos was also present in one of these locations, MHP123.
- 4.3.3 Lead was detected within two soil samples; MHP104 is located in the north of the site and MHP146 is located in the centre-south.
- 4.3.4 PAH compounds were detected above POS Park screening levels at seven site investigation locations. These were typically associated with soils containing coal, ash and clinker.
- 4.3.5 Of the soils in the existing Peace Garden topsoil and subsoil at MHP167 were not compliant with the screening criteria protective of human health and localised remediation will be required. This area is close to the root protection zone of trees to be retained and any remediation will have to be sensitive to this.
- 4.3.6 A plan showing compliant and non-compliant soils screened against criteria for reuse in areas of public open space is included in Appendix 3.
- 4.4 **COMMUNAL GARDENS:**
- 4.4.1 Samples with contaminant concentrations in excess of the screening criteria are set out in Table 4 below.

Table 4: Exceedances of residential without plant uptake screening levels within the analysed soil samples.

Determinand	Number of exceedances	Soil sample in exceedance of residential without plant uptake screening levels
Asbestos	3	MHP112 (0.5 m), MHP123 (0.15 m), MHP161 (0.1 m).
Arsenic	7	MHP104 (0.5 m), MHP107 (0.2 m), MHP114 (0.5 m), MHP146 (0.2 m), MHP159 (0.3 m), MHP162 (0.2 m), MHP171 (0.3 m).
Lead	28	MHP104 (0.5 m), MHP107 (0.2 m), MHP108 (0.1 m), MHP109 (0.15 m), MHP110 (0.1 m), MHP114 (0.5 m), MHP116 (0.5 m), MHP123 (0.5 m), MHP127 (0.05 m), MHP128 (0.4 m), MHP130 (0.3 m), MHP133 (0.2 m), MHP135 (0.3 m), MHP137 (0.2 m), MHP140 (0.1 m), MHP142 (0.1 m), MHP146 (0.2 m), MHP153 (0.4 m), MHP156 (0.2 m), MHP159 (0.3 m), MHP160 (0.05 m), MHP165 (0.3 m), MHP166 (0.5 m), MHP167 (0.1 m), MHP167 (0.3 m),

REMEDIATION METHOD STATEMENT

Determinand	Number of exceedances	Soil sample in exceedance of residential without plant uptake screening levels
		MHP169 (0.15 m), MHP170 (0.1 m), MHP173 (0.2 m).
Aromatic C16-C21	1	MHP145 (0.1 m).
Aromatic C21-C35	1	MHP145 (0.1 m).
Naphthalene	1	MHP145 (0.1 m).
Benzo(a)anthracene	6	MHP126 (0.1 m), MHP130 (0.15 m), MHP145 (0.1 m), MHP152 (0.4 m), MHP155 (0.4 m), MHP162 (0.2 m).
Chrysene	5	MHP126 (0.1 m), MHP130 (0.15 m), MHP145 (0.1 m), MHP152 (0.4 m), MHP155 (0.4 m).
Benzo(b)fluoranthene	25	MHP105 (0.7 m), MHP108 (0.1 m), MHP123 (0.15 m), MHP125 (0.2 m), MHP126 (0.1 m), MHP130 (0.15 m), MHP130 (0.3 m), MHP133 (0.2 m), MHP135 (0.3 m), MHP140 (0.1 m), MHP142 (0.1 m), MHP144 (0.5 m), MHP145 (0.1 m), MHP145 (0.6 m), MHP152 (0.3 m), MHP152 (0.4 m), MHP153 (0.4 m), MHP155 (0.4 m), MHP156 (0.2 m), MHP159 (0.3 m), MHP160 (0.05 m), MHP162 (0.2 m), MHP167 (0.1 m), MHP167 (0.3 m), MHP173 (0.2 m).
Benzo(k)fluoranthene	1	MHP145 (0.1 m).
Benzo(a)pyrene	26	MHP105 (0.7 m), MHP108 (0.1 m), MHP117 (0.1 m), MHP123 (0.15 m), MHP125 (0.2 m), MHP126 (0.1 m), MHP129 (0.4 m), MHP130 (0.15 m), MHP130 (0.3 m), MHP133 (0.2 m), MHP135 (0.3 m), MHP140 (0.1 m), MHP142 (0.1 m), MHP144 (0.5 m), MHP145 (0.1 m), MHP145 (0.6 m), MHP152 (0.3 m), MHP152 (0.4 m), MHP153 (0.4 m), MHP155 (0.4 m), MHP156 (0.2 m), MHP159 (0.3 m), MHP160 (0.05 m), MHP162 (0.2 m), MHP167 (0.1 m), MHP167 (0.3 m).
Indeno(1,2,3-c,d)pyrene	2	MHP145 (0.1 m), MHP152 (0.4 m).
Dibenzo(a,h)anthracene	25	MHP105 (0.7 m), MHP106 (0.2 m), MHP108 (0.1 m), MHP123 (0.15 m), MHP126 (0.1 m),

Determinand	Number of exceedances	Soil sample in exceedance of residential without plant uptake screening levels
		MHP129 (0.4 m), MHP130 (0.15 m), MHP130 (0.3 m), MHP133 (0.2 m), MHP135 (0.3 m), MHP140 (0.1 m), MHP142 (0.1 m), MHP144 (0.5 m), MHP145 (0.1 m), MHP145 (0.6 m), MHP152 (0.3 m), MHP152 (0.4 m), MHP153 (0.4 m), MHP155 (0.4 m), MHP167 (0.1 m), MHP167 (0.3 m), MHP168 (0.15 m), MHP169 (0.15 m), MHP172 (0.4 m), MHP173 (0.2 m).

4.4.2 Asbestos was detected in three samples.

4.4.3 Arsenic, a zootoxic metal, was detected above residential without plant uptake screening levels in seven locations.

4.4.4 Relevant screening levels for lead were exceeded within 28 samples across the site.

4.4.5 Eight PAH compounds were detected above residential without plant uptake screening levels.

4.4.6 A plan showing the distribution of contamination is included as Appendix 3.

4.5 PRIVATE GARDENS:

4.5.1 Samples with contaminant concentrations in excess of the screening criteria are set out in Table 5 below.

Table 5: Exceedances of residential with plant uptake screening levels within the analysed soil samples.

Determinand	Number of exceedances	Soil sample in exceedance of residential with plant uptake screening levels
Asbestos	3	MHP112 (0.5 m), MHP123 (0.15 m), MHP161 (0.1 m).
Arsenic	10	MHP104 (0.5 m), MHP107 (0.2 m), MHP108 (0.1 m), MHP114 (0.5 m), MHP133 (0.2 m), MHP140 (0.1 m), MHP146 (0.2 m), MHP159 (0.3 m), MHP162 (0.2 m), MHP171 (0.3 m).
Cadmium	4	MHP110 (0.1 m), MHP112 (0.1 m), MHP152 (0.3 m), MHP158 (0.3 m).
Lead	58	MHP103 (0.05 m), MHP103 (0.5 m), MHP104 (0.5 m), MHP106 (0.2 m), MHP107 (0.2 m),

REMEDIATION METHOD STATEMENT

Determinand	Number of exceedances	Soil sample in exceedance of residential with plant uptake screening levels
		MHP108 (0.1 m), MHP109 (0.15 m), MHP109 (0.4 m), MHP110 (0.1 m), MHP114 (0.1 m), MHP114 (0.5 m), MHP115 (0.3 m), MHP116 (0.5 m), MHP117 (0.1 m), MHP123 (0.15 m), MHP123 (0.5 m), MHP124 (0.1 m), MHP127 (0.05 m), MHP127 (0.3 m), MHP128 (0.4 m), MHP129 (0.4 m), MHP130 (0.3 m), MHP131 (0.1 m), MHP132 (0.2 m), MHP133 (0.2 m), MHP134 (0.4 m), MHP135 (0.3 m), MHP137 (0.2 m), MHP139 (0.2 m), MHP139 (0.5 m), MHP140 (0.1 m), MHP140 (0.35 m), MHP142 (0.1 m), MHP143 (0.5 m), MHP145 (0.1 m), MHP146 (0.2 m), MHP150 (0.5 m), MHP152 (0.3 m), MHP152 (0.4 m), MHP153 (0.4 m), MHP154 (0.6 m), MHP155 (0.4 m), MHP156 (0.2 m), MHP157 (0.4 m), MHP158 (0.3 m), MHP159 (0.3 m), MHP159 (0.6 m), MHP160 (0.05 m), MHP161 (0.1 m), MHP161 (0.3 m), MHP165 (0.3 m), MHP166 (0.5 m), MHP167 (0.1 m), MHP167 (0.3 m), MHP169 (0.15 m), MHP170 (0.1 m), MHP172 (0.4 m), MHP173 (0.2 m).
Aromatic C12-C16	1	MHP145 (0.1 m).
Aromatic C16-C21	2	MHP145 (0.1 m), MHP152 (0.2 m).
Aromatic C21-C35	1	MHP145 (0.1 m).
Naphthalene	1	MHP145 (0.1 m).
Phenanthrene	2	MHP145 (0.1 m), MHP152 (0.4 m).
Fluoranthene	1	MHP145 (0.1 m).
Benzo(a)anthracene	9	MHP126 (0.1 m), MHP130 (0.15 m), MHP133 (0.2 m), MHP144 (0.5 m), MHP145 (0.1 m), MHP145 (0.6 m), MHP152 (0.4 m), MHP155 (0.4 m), MHP162 (0.2 m).
Chrysene	5	MHP126 (0.1 m), MHP130 (0.15 m), MHP145 (0.1 m), MHP152 (0.4 m), MHP155 (0.4 m).

REMEDIATION METHOD STATEMENT

Determinand	Number of exceedances	Soil sample in exceedance of residential with plant uptake screening levels
Benzo(b)fluoranthene	28	MHP105 (0.7 m), MHP108 (0.1 m), MHP114 (0.5 m), MHP117 (0.1 m), MHP123 (0.15 m), MHP125 (0.2 m), MHP126 (0.1 m), MHP129 (0.4 m), MHP130 (0.15 m), MHP130 (0.3 m), MHP133 (0.2 m), MHP135 (0.3 m), MHP140 (0.1 m), MHP142 (0.1 m), MHP144 (0.5 m), MHP145 (0.1 m), MHP145 (0.6 m), MHP152 (0.3 m), MHP152 (0.4 m), MHP153 (0.4 m), MHP155 (0.4 m), MHP156 (0.2 m), MHP159 (0.3 m), MHP160 (0.05 m), MHP162 (0.2 m), MHP167 (0.1 m), MHP167 (0.3 m), MHP173 (0.2 m).
Benzo(k)fluoranthene	1	MHP145 (0.1 m).
Benzo(a)pyrene	28	MHP105 (0.7 m), MHP108 (0.1 m), MHP116 (0.5 m), MHP117 (0.1 m), MHP123 (0.15 m), MHP125 (0.2 m), MHP126 (0.1 m), MHP129 (0.4 m), MHP130 (0.15 m), MHP130 (0.3 m), MHP133 (0.2 m), MHP135 (0.3 m), MHP140 (0.1 m), MHP142 (0.1 m), MHP144 (0.5 m), MHP145 (0.1 m), MHP145 (0.6 m), MHP152 (0.3 m), MHP152 (0.4 m), MHP153 (0.4 m), MHP155 (0.4 m), MHP156 (0.2 m), MHP159 (0.3 m), MHP160 (0.05 m), MHP162 (0.2 m), MHP167 (0.1 m), MHP167 (0.3 m), MHP173 (0.2 m).
Indeno(1,2,3-c,d)pyrene	4	MHP126 (0.1 m), MHP130 (0.15 m), MHP145 (0.1 m), MHP152 (0.4 m).
Dibenzo(a,h)anthracene	27	MHP105 (0.7 m), MHP106 (0.2 m), MHP108 (0.1 m), MHP112 (0.5 m), MHP115 (0.3 m), MHP123 (0.15 m), MHP126 (0.1 m), MHP129 (0.4 m), MHP130 (0.15 m), MHP130 (0.3 m), MHP133 (0.2 m), MHP135 (0.3 m), MHP140 (0.1 m), MHP142 (0.1 m), MHP144 (0.5 m), MHP145 (0.1 m), MHP145 (0.6 m), MHP152 (0.3 m), MHP152 (0.4 m), MHP153 (0.4 m), MHP155 (0.4 m), MHP167 (0.1 m), MHP167 (0.3 m), MHP168

Determinand	Number of exceedances	Soil sample in exceedance of residential with plant uptake screening levels
		(0.15 m), MHP169 (0.15 m), MHP172 (0.4 m), MHP173 (0.2 m).

- 4.5.2 Asbestos was identified in three soil samples.
- 4.5.3 Arsenic was detected above these screening criteria in a total of 10 soil samples, distributed across the site.
- 4.5.4 Cadmium was detected above screening criteria within four soil samples.
- 4.5.5 Lead contamination was recorded above relevant screening values within 58 of the 98 samples tested for.
- 4.5.6 Mid to long-chain aromatic TPH was recorded above screening levels within MHP145 (0.1 m) and MHP152 (0.2 m).
- 4.5.7 Ten PAH compounds were detected above residential with plant uptake screening values.
- 4.5.8 A plan showing the distribution of contamination is included in Appendix 3.
- 4.6 **ZONING EXERCISE**
- 4.6.1 Due to the very limited thickness of topsoil, the contamination within both the shallow made ground and topsoil have been considered together. It should also be noted that the made ground is likely to be of limited amenity value and may not represent a suitable growing medium for new areas of planting. This should be discussed with the landscape architect and its reuse would be subject to approval by the Local Planning Authority.
- 4.6.2 As a minimum replacement topsoil will be required and the existing material could only be used as subsoil, but subject to the following:
- i. **Peace Garden:** Other than a small area in the south-eastern corner soils within the Peace Garden, soils can be retained without the requirement for remediation. A localised area of mitigation will be required, but this should be undertaken in such a manner as not to disturb the adjacent trees.
 - ii. **Outside of the Peace Garden:** chemically, very little of the soil would be suitable for retention below areas of private gardens. However, it may be possible to retain materials won from the areas shown on the Drawings in Appendix 3.

- iii. Similarly, it will be possible to retain site won soils from the areas illustrated by the Drawings in Appendix 3 for reuse in areas of communal gardens as subsoil.
 - iv. Site won soils could be retained as a general fill for use below 600 mm in new private areas and 300 mm in communal areas without further testing or segregation. General fill can also be used below buildings, roads and in backfilling remedial excavations.
- 4.6.3 If it is decided to try to selectively excavate soils, there will be three classes of material:
 - i. Subsoil suitable for use in the extension of the Peace Garden.
 - ii. Subsoil suitable for retention in communal landscaped areas.
 - iii. Subsoil suitable for use beneath private gardens.
- 4.6.4 It is also considered that soils containing asbestos, cannot be used as a subsoil, but could be retained as a general fill.
- 4.6.5 Based upon the zoning exercise, the conceptual model for the site for shallow soils has been revised:

Table 6: Revised Conceptual Model

POSSIBLE POLLUTANT LINKAGE			RISK CHARACTERISATION
POTENTIAL SOURCES	PATHWAYS	RECEPTORS	
Heavy metals and hydrocarbons (made ground)	Contact with contaminated soil	Human health (current users)	Low risk identified Made ground is impacted by several forms of contamination. However, the site has few current site users.
	Ingestion and inhalation of contaminated soil and dust	Human health (current users)	
Heavy metals and hydrocarbons (made ground)	Contact with contaminated soil	Human health (future residents and construction workers)	Low to moderate risk identified Contamination of made ground soils metals, PAH and asbestos. However, site won soils can be reused depending upon the proposed land use.
	Ingestion and inhalation of contaminated soil and dust	Human health (future residents and construction workers)	
Asbestos (made ground and structures)	Ingestion and inhalation of contaminated soil and dust	Human health (future residents and construction workers)	Varying – Low risk I areas where no asbestos encountered. Locally moderate to high risk identified A significant number of asbestos detections (fibres and fragments) were reported across the site, typically in the made ground. Asbestos lagging is present in the subsurface heating system and probably in onsite buildings. However, site won soils can be reused depending upon the proposed land use.

POSSIBLE POLLUTANT LINKAGE			RISK CHARACTERISATION
POTENTIAL SOURCES	PATHWAYS	RECEPTORS	
Radiation (medical sources)	Contacted with source or contaminated material	Human health (future residents and construction workers)	Low risk The radiation used represents a closed source - this will have been removed from site.
Contamination (all forms)	Vertical migration to aquifer	Controlled waters	Low risk identified Limited shallow groundwater has been encountered and a significant thickness of London Clay acts as an aquitard to the aquifer at depth.
Contamination (all forms)	Horizontal migration to surface water	Controlled waters	Low risk identified Nearest surface water feature is significantly distant.
Hydrocarbons	Direct contact	Plastic water pipes	Moderate risk identified Significant PAH contamination presents a risk to permeable services.
Hazardous Gas/Vapours In soil	Ingress into buildings and voids	Human health (future residents and construction workers)	Low risk identified Based on the available data, the ground gas regime is considered to be Green (low risk).
Phytotoxic metals	Direct contact/root uptake	Ornamental planting	Low risk identified Concentrations of zinc were encountered above the applicable criteria in four samples. However, healthy plant growth was noted, indicating that the contamination is of limited bio-accessibility. The provision of clean cover will provide a proficient growth medium.
Adjacent Land	Horizontal migration of groundwater/gas.	Neighbouring properties	Low risk identified The available data indicates a low risk.

4.6.6 Contamination that requires remediation or management are limited to the following:

- i. Risk to future residents from asbestos in soils;
- ii. Risks of asbestos fibre release during construction, which will require management controls;
- iii. Risks to future residents from metals and PAH in shallow made ground soils;
- iv. Management of heating ducts;
- v. Remediation of gross hydrocarbon contamination associated with the former boiler house;
- vi. Risk to plastic water pipes from contamination of soils.

- 4.6.7 Remedial actions are considered necessary to mitigate these risks. This could include the reuse of site-won soils as appropriate and in consultation with the landscape architect.
- 4.6.8 Remedial requirements within the Peace Garden are limited to the south-eastern corner. Due to the presence of trees to be retained, the extent of remediation will be limited.

SECTION 5 OPTIONS APPRAISAL

- 5.1 Localised gross hydrocarbon contamination has been identified in the vicinity of the boiler house. This will require remediation, with soils likely to be treated on site to facilitate reuse. The most efficient and cost-effective remedial solution is likely to include a combination of bioremediation and stabilisation. A degree of post-demolition site investigation and declination following the removal of the boiler house is required to confirm the extent of impacted soils and the final remedial solution.
- 5.2 Where the heating ducts are located beneath the proposed buildings and infrastructure removal will be required to facilitate the development. Because these represent a physical constraint, excavation and processing is likely to represent to only viable solution. However, where the ducts remain at depths below areas of public open space or infrastructure and buildings to be retained, their complete removal is not necessary. In clean areas of clean cover, the ducts and clean soils will effectively encapsulate any residual material. Within buildings an asbestos management plan must be adopted.
- 5.3 With these exceptions, contamination is limited to the made ground and shallow soils beneath the site. In these areas the level of risk is governed by the proposed end-use. Here, the potential risks could be mitigated through either removal of the source or management of the potential pathways. Given the extent of made ground and nature of the development, removal or treatment of the contamination is not considered practical or viable. As a result, the most appropriate remedial solution will be through the management of potential pathways.
- 5.4 This will be achieved through the provision of suitable soils in areas of soft landscaping and upgraded water pipes. Buildings and hardstanding will break residual pathways and no further action is required.
- 5.5 Due to the limited contamination and remedial option, a full Remedial Options Appraisal is not considered appropriate.

SECTION 6 DETAILED REMEDIATION STRATEGY

6.1 SCOPE

6.1.1 Based upon the site investigation data, contamination on site can be managed through the implementation of the measures set out below. As a result, a detailed options appraisal is not considered appropriate.

6.1.2 Based upon the site investigation data obtained, potential risks to future site users, construction workers and infrastructure have been identified. As a result, remediation will be required.

6.1.3 Remediation activities will be limited to the following:

- i.* Decommissioning of the relict heating system;
- ii.* Removal of concrete slabs, sub surface structures and relict infrastructure;
- iii.* Removal of localised grossly impacted soils;
- iv.* Dewatering of contaminated pockets of perched water (if encountered) – shallow groundwater was encountered in the south of the site;
- v.* Provision of suitable soils in areas of soft landscaping over a dewatering barrier – to be installed as part of the final development; and,
- vi.* Provision of upgraded water pipes.

6.1.4 Upon completion of the works a validation report will be prepared to include an account of the works undertaken, the results of any associated validation testing and the conclusions from environmental monitoring. Waste transfer tickets will also be provided.

6.2 DECOMMISSIONING OF THE RELICT HEATING SYSTEM

6.2.1 The heating network across the site includes tunnels and ducts radiating out from the boiler house. A demolition survey carried out by Eton Environmental of the heating system identified asbestos including hard set lagging in the tunnels, ducts and basements across the site. Where it coincides with the construction proposals the heating system will require decommissioning by a licenced asbestos removal contractor with all necessary controls in place. However, where the heating system is not interfering with the build, it could be left in *situ*.

6.3 CONCRETE SLAB AND SUB SURFACE STRUCTURE REMOVAL

6.3.1 Where concrete slabs have been encountered, they should be thoroughly inspected prior to being broken by mechanical means under a watching brief. Any visible asbestos (including bonded asbestos) should be removed in a controlled manner for off-site disposal. It is recommended that following slab removal/clearance, inspection of the ground surface is carried out and analysis of any suspect debris

encountered should be undertaken. Site personnel should be aware of the potential for encountering asbestos during the construction phase and should report any should it be encountered or suspected during the works so it may be dealt with appropriately. Measures should also be taken to damp down soils during excavation/groundworks.

6.4 EXCAVATION OF SOILS

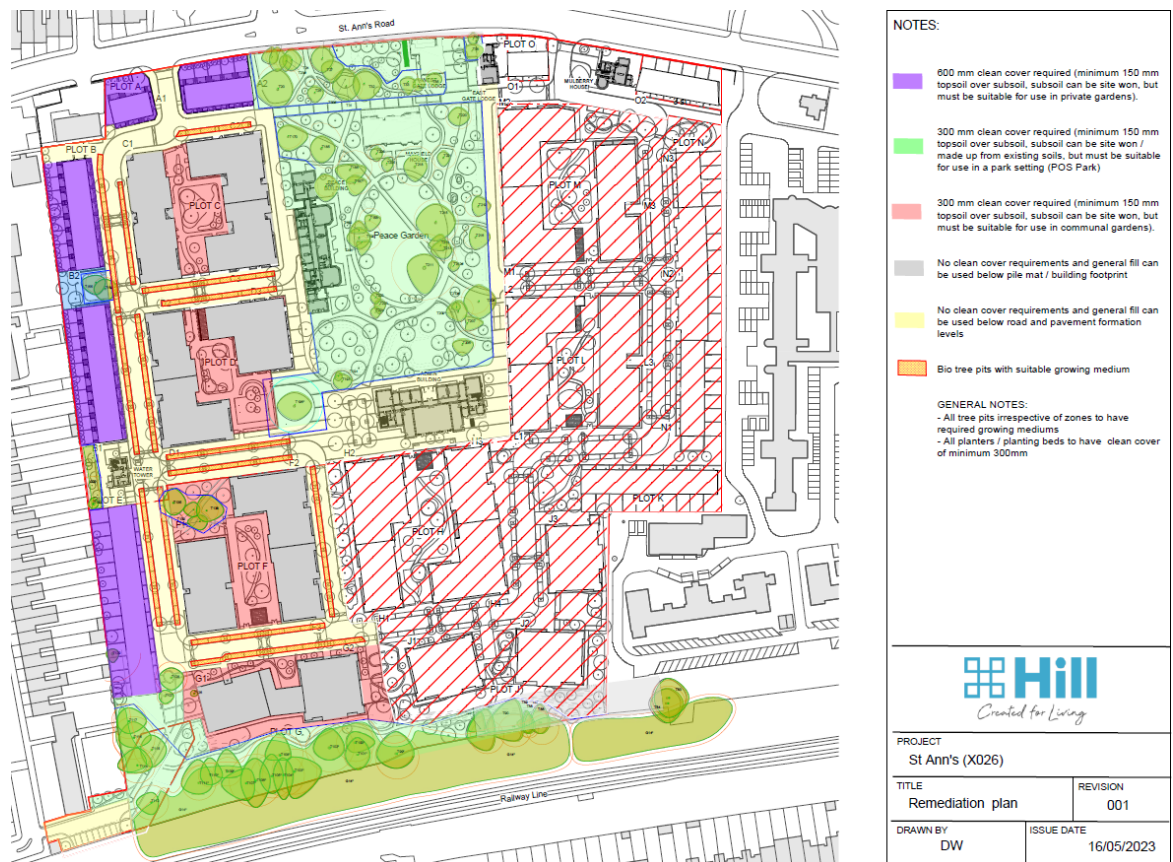
6.4.1 It is anticipated that, subject to careful excavation and further testing, some site won soils could be retained on site for reuse as subsoil (there is not sufficient site won topsoil for this to provide a viable resource). To maximise the potential for reuse in areas of landscaping soils must be carefully excavated in the presence of a suitably qualified and experienced banksman.

6.4.2 Following an initial vegetation scrape, soils will be excavated and stockpiled for reuse. Stockpiles must be segregated based upon material types and their proposed reuse. The following types of material are anticipated:

- i.* Subsoil suitable for use in the extension of the Peace Garden.
- ii.* Subsoil suitable for retention in communal landscaped areas.
- iii.* Subsoil suitable for use beneath private gardens.
- iv.* General fill.
- v.* Unsuitable soils.

6.4.3 Unsuitable soils are those containing visible fragments of asbestos, or high portions of material such as brick, concrete, or glass that would render them unsuitable for use as a subsoil or adversely affect their amenity value. The reuse of soils is illustrated by Figure 3.

Figure 3: Reuse of Soils:



- 6.4.4 The excavation and stockpiling of soils shall be informed by the Drawings included as Appendix 3. However, this must be supplemented by supervision, inspection and testing.
- 6.4.5 Soils to be reused as general fill beneath capping layers do not require inspection or further testing.
- 6.5 **GROSS CONTAMINATION**
- 6.5.1 The site includes a tank farm comprising three above-ground tanks, it is also believed that fuel lines run from the tank farm to the boiler house. To date organoleptic evidence of contamination in this area has been limited to a strong hydrocarbon odour at MTP04. Tanks and related infrastructure should be removed in a controlled manner with method statements in place as appropriate to avoid the release of contaminated material.
- 6.5.2 Further intrusive investigation will be required following removal of the boiler house and tanks. This will consist of the excavation of machine-dug trial pits, supplemented by laboratory chemical analysis of soils to delineate areas of gross hydrocarbon contamination.

- 6.5.3 Should grossly impacted soils be encountered, they should be excavated or treated and disposed of in an appropriate manner. If free-product is encountered on groundwater it should be removed using absorbent pads or by skimming. Once the free-product has been removed the excavation shall be left open for a period of 24 hours to ensure that there is no contamination rebound. If this is the case, the process shall be repeated, and the pit left open for a further 24 hours.
- 6.5.4 Any areas of gross hydrocarbon contamination identified should be treated or removed off site. Verification of the removal of gross contamination will be through visual inspection.
- 6.6 **PEACE GARDEN**
- 6.6.1 Soils in trial pit MHP167 were found to be contaminated above the thresholds suitable for this land use. Contamination was identified in soils from 0.1 m. This area site within or adjacent to the root protection zone of a tree that is to be retained.
- 6.6.2 A plan showing the affected area is included in Appendix 3. Within this area soils will be carefully excavated to a maximum depth of 150 mm or to the top of the root ball. A permeable geotextile marker layer will be placed as a marker layer, with clean imported soils placed over the marker layer. The thickness of the soils will be feathered to minimise loading of the root zone.
- 6.6.3 The chemical quality of the soils must meet the criteria set out in Table 7. Validation of the chemical quality of clean cover shall be obtained at a rate of one sample per 250 cubic metres (a minimum of three samples per source).
- 6.6.4 Excavated soils shall be removed from site.
- 6.6.5 The extent of the remedial excavation in this area shall be validated through visual inspection only to ensure that replacement soils have been adequately placed.
- 6.7 **RETAINED TREES**
- 6.7.1 Contamination was also encountered in hand pits (MHP015 and MHP17) advanced around a TPO tree. It is therefore unlikely that sufficient made ground could be removed or apply capping applied in this area. Therefore, it is likely that a limited thickness is removed in a feathered manner and replaced with a geotextile and clean imported soil.
- 6.7.2 The same approach will apply to any trees to be retained.
- 6.8 **NEW TREES**
- 6.8.1 New trees must be planted in clean imported soil. The planting specification for these will be determined by the landscape architect. It is understood that some of the proposed trees will be fruit-bearing. In such instances, the soils within the proposed root zone must meet the criteria set out in Table 7.

- 6.8.2 In this instance, the root zone shall include the anticipated extent of root growth.
- 6.8.3 Validation of the chemical quality of clean cover shall be obtained at a rate of one sample per 250 cubic metres (a minimum of three samples per source).
- 6.9 **SUITABLE SOILS**
 - 6.9.1 Clean capping is required in soft landscaped areas. This activity will require the use of suitably validated materials over a deter to dig barrier. The deter to dig barrier is not required in instances where natural uncontaminated soils are exposed. Furthermore, in these instances, the thickness of clean cover can be reduced to the top of the clean natural soils.
 - 6.9.2 The remedial strategy requires in all newly formed areas of soft landscaping to comprise:
 - i. 600 mm suitable soil over a deter to dig barrier in private gardens and 300 mm in communal landscaping.
 - 6.9.3 Clean capping may be formed of either site-won or imported materials according to the validation criteria set out in the following sections. Site won soil will, however, only be suitable for use as a sub-soil.
 - 6.9.4 Material imported for the formation of landscaped areas should be obtained from a validated source. The validation should incorporate an assessment of the provenance of the material and chemical analysis.
 - 6.9.5 In addition to information provided by the topsoil/subsoil supplier, validation testing shall be carried out by IDOM as set out below.
 - 6.9.6 Once placed, the depth of placed the thickness of the clean capping shall be verified by hand-dug pit.
 - 6.9.7 Validation of the chemical quality of clean cover shall be obtained at a rate of one sample per 250 cubic metres (a minimum of three samples per source/material type). Acceptance criteria for soil is presented in Table 7 for imported soil and Table 8 for site won soils. Site won soil may only be used a subsoil.
 - 6.9.8 A validation report will present the above data for clean cover placed in private and communal garden areas including provenance, chemical quality and depths placed. The validation report will be provided to the Local Authority and the Environment Agency (EA) upon completion of the development.
 - 6.9.9 The reuse of site won soils should be under a Material's Management Plan to be produced in accordance with the CLA:IRE Code of Practice.
- 6.10 **SPECIFICATIONS FOR SOIL**
 - 6.10.1 These specifications will be additional requirements to the terms of appointment for suppliers and groundwork contractors.

- 6.10.2 Acceptance criteria for imported will be applied as per Table 7 below. The criteria for the reuse as site won soils as subsoil will be as per Table 8. These are based on Suitable for Use Levels (S4ULs) published in 2015 by LQM/CIEH and are subject to the proposed land use in each portion of the site. These precautionary screening levels are designed to be representative of minimal risk to human health in a residential setting (with active update). For lead the DEFRA Category 4 Screening Level has been used as this is based on updated toxicological data and a low risk to human health.

Table 7: Acceptance Criteria for Imported Topsoil and Subsoil

CONTAMINANT	UNITS	Acceptance Criteria ALL AREAS
Asbestos in soil	-	none
Anthropogenic inclusions	-	none
pH	-	6 – 9
Arsenic	mg.kg ⁻¹	37
Cadmium	mg.kg ⁻¹	11
Chromium (total)	mg.kg ⁻¹	910
Hexavalent Chromium	mg.kg ⁻¹	6
Lead	mg.kg ⁻¹	200
Mercury	mg.kg ⁻¹	40
Nickel	mg.kg ⁻¹	130
Selenium	mg.kg ⁻¹	250
TPH Aliphatic >EC ₅ - EC ₆	mg.kg ⁻¹	42
TPH Aliphatic >EC ₆ - EC ₈	mg.kg ⁻¹	100
TPH Aliphatic >EC ₈ - EC ₁₀	mg.kg ⁻¹	27
TPH Aliphatic >EC ₁₀ - EC ₁₂	mg.kg ⁻¹	130
TPH Aliphatic >EC ₁₂ - EC ₁₆	mg.kg ⁻¹	1000*
TPH Aliphatic > EC ₁₆ – EC ₂₁	mg.kg ⁻¹	1000*
TPH Aliphatic > EC ₂₁	mg.kg ⁻¹	1000*
TPH Aromatic >EC ₅ - EC ₇	mg.kg ⁻¹	70
TPH Aromatic >EC ₇ - EC ₈	mg.kg ⁻¹	130
TPH Aromatic >EC ₈ - EC ₁₀	mg.kg ⁻¹	34
TPH Aromatic >EC ₁₀ - EC ₁₂	mg.kg ⁻¹	74
TPH Aromatic >EC ₁₂ - EC ₁₆	mg.kg ⁻¹	140
TPH Aromatic >EC ₁₆ - EC ₂₁	mg.kg ⁻¹	260
TPH Aromatic >EC ₂₁	mg.kg ⁻¹	1000*
Benzene	mg.kg ⁻¹	0.087
Toluene	mg.kg ⁻¹	130
Ethylbenzene	mg.kg ⁻¹	47
Xylene	mg.kg ⁻¹	56
Acenaphthene	mg.kg ⁻¹	210
Acenaphthylene	mg.kg ⁻¹	170
Anthracene	mg.kg ⁻¹	1000*

REMEDIATION METHOD STATEMENT

CONTAMINANT	UNITS	Acceptance Criteria ALL AREAS
Benz(a)anthracene	mg.kg ⁻¹	7.2
Benzo(a)pyrene	mg.kg ⁻¹	2.2
Benzo(b)fluoranthene	mg.kg ⁻¹	2.6
Benzo(ghi)perylene	mg.kg ⁻¹	320
Benzo(k)fluoranthene	mg.kg ⁻¹	77
Chrysene	mg.kg ⁻¹	15
Dibenz(ah)anthracene	mg.kg ⁻¹	0.24
Fluoranthene	mg.kg ⁻¹	280
Fluorene	mg.kg ⁻¹	170
Indeno(123-cd)pyrene	mg.kg ⁻¹	27
Naphthalene	mg.kg ⁻¹	2.3
Phenanthrene	mg.kg ⁻¹	95
Pyrene	mg.kg ⁻¹	620
Phenol	mg.kg ⁻¹	120
Phytotoxins	Units	
Copper	mg.kg ⁻¹	200
Nickel	mg.kg ⁻¹	110
Zinc	mg.kg ⁻¹	300

Note: *Screening levels capped to protect amenity

Table 8: Criteria for Reuse of Site Won Material as Subsoil:

Determinand	Units	Residential with homegrown produce	Residential without homegrown produce	POSpark (Peace Garden Only)
Arsenic	mg.kg ⁻¹	37	40	170
Cadmium	mg.kg ⁻¹	11	85	532

REMEDIATION METHOD STATEMENT

Chromium (III)	mg.kg ⁻¹	910	910	33000
Chromium (VI)	mg.kg ⁻¹	6	6	220
Lead	mg.kg ⁻¹	200	310	1300
Inorganic Mercury	mg.kg ⁻¹	40	56	240
Nickel	mg.kg ⁻¹	180	180	3400
Selenium	mg.kg ⁻¹	250	430	1800
Aliphatic C5-6	mg.kg ⁻¹	42	42	95000
Aliphatic C>6-8	mg.kg ⁻¹	100	100	150000
Aliphatic C>8-10	mg.kg ⁻¹	27	27	14000
Aliphatic C>10-12	mg.kg ⁻¹	130	130	21000
Aliphatic C>12-16	mg.kg ⁻¹	1100	1100	25000
Aliphatic C>16-35	mg.kg ⁻¹	65000	65000	450000
Aliphatic C>35-44	mg.kg ⁻¹	65000	65000	450000
Aromatic C5-7	mg.kg ⁻¹	70	370	76000
Aromatic C>7-8	mg.kg ⁻¹	130	860	87000
Aromatic C>8-10	mg.kg ⁻¹	34	47	7200
Aromatic C>10-12	mg.kg ⁻¹	74	250	9200
Aromatic C>12-16	mg.kg ⁻¹	140	1800	10000
Aromatic C>16-21	mg.kg ⁻¹	260	1900	7600
Aromatic C>21-35	mg.kg ⁻¹	1100	1900	7800
Aromatic C>34-44	mg.kg ⁻¹	1100	1900	7800
Phenol	mg.kg ⁻¹	280	750	760
Benzene	mg.kg ⁻¹	0.087	0.38	90
Toluene	mg.kg ⁻¹	130	880	87000
Ethylbenzene	mg.kg ⁻¹	47	83	17000
Xylene	mg.kg ⁻¹	26	79	17000
Acenaphthene	mg.kg ⁻¹	210	3000	29000
Acenaphthylene	mg.kg ⁻¹	170	2900	29000
Anthracene	mg.kg ⁻¹	2400	31000	150000
Benzo(a)anthracene	mg.kg ⁻¹	7.2	11	49
Benzo(a)pyrene	mg.kg ⁻¹	2.2	3.2	11
Benzo(b)fluoranthene	mg.kg ⁻¹	2.6	3.9	13
Benzo(k)fluoranthene	mg.kg ⁻¹	320	360	1400
Benzo(g,h,i)perylene	mg.kg ⁻¹	77	110	370
Chrysene	mg.kg ⁻¹	15	30	93
Dibenzo(a,h)anthracene	mg.kg ⁻¹	0.24	0.31	1.1
Fluoranthene	mg.kg ⁻¹	280	1500	6300
Fluorene	mg.kg ⁻¹	170	2800	20000
Indeno(1,2,3-c,d)pyrene	mg.kg ⁻¹	27	45	150
Naphthalene	mg.kg ⁻¹	2.3	2.3	1200
Phenanthrene	mg.kg ⁻¹	95	1300	6200
Pyrene	mg.kg ⁻¹	620	3700	15000
Phytotoxins				
Copper	mg.kg ⁻¹	200	200	200
Nickel	mg.kg ⁻¹	110	110	110
Zinc	mg.kg ⁻¹	300	300	300

6.11 COMPACTION

- 6.11.1 Site won or imported fill can be used to backfill remedial excavations, excavations resulting from demolition or the removal of heating ducts.
- 6.11.2 Material will be backfilled in 200 mm layers, stabilised and compacted to the Specification for Highways Works: Series 600 Earthworks. Compaction will be

carried out using a dozer-towed roller with a minimum of four passes. This may be increased subject to on site geotechnical testing. A banksman will ensure the correct number of passes is carried out to achieve the desired design specification.

6.12 BOREHOLE DECOMMISSIONING

- 6.12.1 If boreholes need to be removed, they should be decommissioned in accordance with Environment Agency guidance on decommissioning of redundant wells.

6.13 DISCOVERY STRATEGY

- 6.13.1 Whilst the investigation undertaken on the site is considered to be thorough, it remains possible that unexpected soil conditions may be encountered during the process of site demolition and remediation.

- 6.13.2 Examples may include oily pockets within the soil, pockets of cement boarding on fibrous materials within the soil, ACM, black ashy materials, soils exhibiting strong odours and underground structures.

- 6.13.3 Where such unexpected conditions are encountered the following approach will be taken:

- i. All discoveries are to be reported to the Site Manager immediately and works at that location are to halt until further notice;
- ii. The Site Manager is to report any such discoveries to the Employer's Representative who will also act as the Environmental Consultant;

- 6.13.4 Following notification from the Site Manager, the Environmental Consultant will discuss the discovery with the Local Authority and if considered necessary, arrange to meet an Officer on site to further assess the discovery.

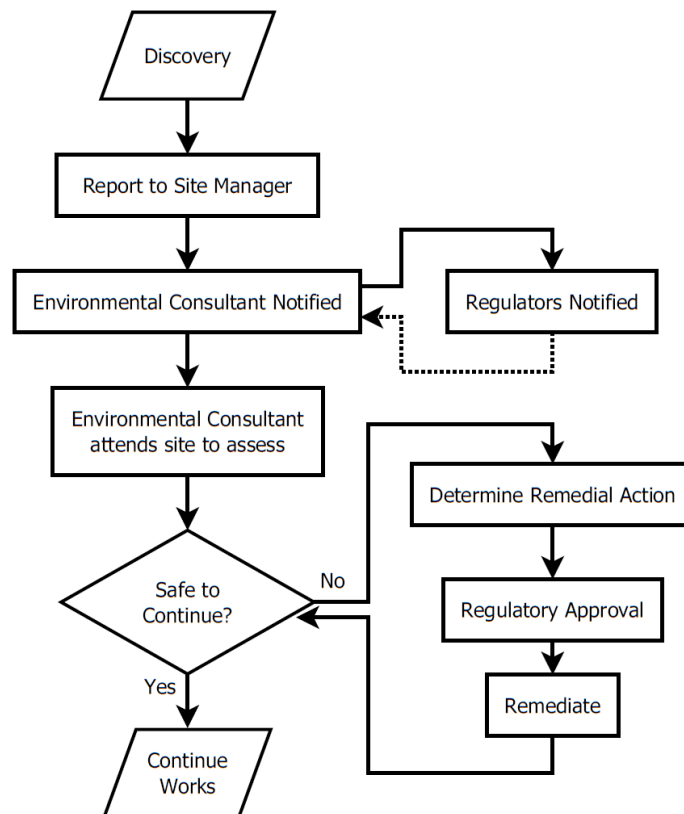
- 6.13.5 The Environmental Consultant will attend the site to record the location, extent and nature of the discovery and implement an appropriate sampling and analysis regime, taking due account of the type and nature of the discovery as well as known and probable land uses in that area of the site.

- 6.13.6 Where remedial action is required, regulatory consultation and approval will be sought.

- 6.13.7 A record will be produced by the Environmental Consultant or his delegates and held on site (with copies held by the Environmental Consultant, Employer's Representative and Local Authority), detailing the discovery, assessment works undertaken, findings thereof, confirmation either of no action required or detailing the remedial action taken and validation thereof.

- 6.13.8 A discovery strategy flow diagram is presented in Figure 4 below.

Figure 4: Discovery strategy for unforeseen contamination



6.13.9 During excavation large boulders of concrete will be segregated using mechanical excavator for subsequent processing/treatment. Segregated made ground materials will be passed through a screener to recover oversized material (>63 mm) for subsequent treatment. A proportion of this oversize material may need to be subjected to a wet screening treatment to remove surface contaminants prior to further processing/crushing to ensure that the fill criteria are met.

6.13.10 To avoid cross contamination of the ground surface, hydrocarbon contaminated materials to be stockpiled or treated will be situated upon a soil handling/treatment area with engineered leachate containment to be constructed within the site. All stockpiles will be managed and appropriately labelled with unique identification numbers.

6.14 MANAGEMENT OF POTENTIAL ASBESTOS-CONTAINING MATERIALS

6.14.1 Asbestos present has been detected in several samples as fibres and fragments of ACM have also been encountered. The principal mitigation measures are to manage the potential risks to workers and the fugitive release of fibres from the site.

6.14.2 The heating system would require decommissioning by a licenced asbestos removal contractor with all necessary controls in place. Measures will need to be taken to assess the potential for asbestos materials which have become spread beyond the ducts.

- 6.14.3 Should any notifiable ACMs be encountered during the works, the impacted materials area will be quarantined until additional precautions are in place to comply with an ASB5 Notification to the HSE, unless a 'blanket' notification for the works can be discussed and agreed with the HSE due to potential for unforeseen materials. ACM impacted soils will be carefully excavated under close supervision by an experienced asbestos supervisor and transferred to a quarantine area for further hand-picking treatment by trained asbestos operatives. Recovered fragments of ACM will be hand-picked and placed in appropriate containment by competent, trained asbestos operatives as a primary treatment.
- 6.14.4 The Environmental Consultant will direct any additional precautions that need to be taken, such as water suppression and application of soil bonding agents during excavation works. The use of fine mist water spraying combined with bonding agents would not only reduce the risk of airborne fibre release but also reduce the potential for liberation of fibres from ACMs into the soil matrix during excavation and screening operations.
- 6.14.5 Areas of concrete/brick materials showing evidence of asbestos contamination must be dealt with in a controlled manner in accordance with the approved codes of practice for working with asbestos containing materials. When asbestos contamination is evident in a particular area, work should not proceed until the situation has been assessed in order that the workforce is adequately protected.
- 6.14.6 The presence of cement-bonded asbestos materials poses a lower risk to workers and often these materials may be easily handpicked from the area. Fibrous asbestos waste poses a high risk to workers, especially when it is dry and friable. It cannot be easily separated from other materials and any work carried out must be notified to the HSE.
- 6.14.7 Loose fibres of asbestos have been identified in the Made Ground. Measures will be put in place to ensure working areas are kept damp and personal and site boundary fibre monitoring will be carried out to ensure loose fibres do not present a risk to the workforce or neighbouring sites.
- 6.14.8 During all works involving the removal and treatment of ACMs, specialist air monitoring is performed using a UKAS accredited laboratory service at an appropriate frequency for reassurance purposes to confirm that the residual asbestos fibre concentrations are below the lower limit of detection. Reassurance air sampling will be undertaken at regular intervals at boundary and workplace/personal monitoring locations.
- 6.14.9 The method for carrying out asbestos air monitoring and evaluation will be undertaken in accordance with HSG248 '*The Analysts Guide*', and is by phase contrast microscopy under The Control of Asbestos Regulations (2012).
- 6.14.10 Reassurance air sampling will be undertaken along the perimeter of the asbestos work zones, and task-specific personal monitoring will be undertaken as deemed

necessary during risk assessment. A trigger <0.01 fibres.ml⁻¹ will be the level that is not to be exceeded and will cause cessation of work until the source of the elevation is identified and rectified. This trigger level represents the lowest quantification limit using standard methodologies as set out by HSG248 and MDHS39/4. An appropriate period of baseline monitoring will be undertaken prior to commencement of any works in the ARA work zone.

- 6.14.11 For air monitoring a temporary site laboratory will be setup so air test results can be obtained within an hour of the test being undertaken.
- 6.14.12 Dust control will be achieved using deployment of fine mist suppression at the excavation point and frequent damping down/covering of any ACM stockpiles.
- 6.14.13 Copies of all waste consignment notices, and a completed Duty of Care Schedule will be compiled.

6.15 **MONITORING**

- 6.15.1 The site is underlain by the London Clay Formation, which will not be penetrated by the proposed works. As a result no long-term monitoring of groundwater is proposed.
- 6.15.2 Those responsible for landscaping must check and observe areas of soft landscaping. Where evidence of soil erosion or loss is recorded, compliant topsoil must be placed to ensure that the thickness of soil is not reduced. The landscape team must maintain a written record of inspections and provide details of any remedial works required.

6.16 **WASTE MANAGEMENT**

- 6.16.1 The remediation contractor will be responsible for obtaining all necessary licences, consents and approvals relating to the processing and/or re-deposition of waste materials at the site to ensure compliance with relevant legislation.
- 6.16.2 Materials which cannot be re-used on site, or which are surplus to requirements, will be disposed of to suitably licensed facilities, either for recycling or for final disposal. Materials, including waste soils which are not to be retained on site, should be removed and disposed of using appropriately licensed hauliers and in accordance with all relevant statutes including the *Environmental Protection Act 1990* as amended, *The Controlled Waste Regulations 2012* as amended, *The Waste Regulations 2011* as amended, *The Hazardous Waste Regulations 2005* as amended, *The Waste Management Regulations 2006*, *The Environmental Permitting Regulations 2010* as amended and *The Hazardous Waste (Miscellaneous Amendments) Regulations 2015*.
- 6.16.3 All waste transfer notes and weighbridge receipts will be made available by the contractor to the Client.

- 6.16.4 By careful sorting, segregation and management of arisings the contractor will seek to minimise the volume of hazardous waste which requires disposal (e.g. asbestos contaminated arisings will not be added to stockpiles containing other wastes).
- 6.16.5 Stockpiles will be managed under the guidance of a Qualified Person in accordance with the guidance provided in The Definition of Waste: Development Industry Code of Practice v2, CL:AIRE, March 2011. To comply with this guidance, a Materials Management Plan (MMP) will need to be compiled for independent review by a Qualified Person (QP) prior to declaration to the EA. Verification that the declared MMP has been adhered to will need to be included within the Site Verification Report.
- 6.17 **ENVIRONMENTAL MONITORING, HEALTH AND SAFETY**
 - 6.17.1 A monitoring programme should be adhered to throughout the duration of the works to prevent harm to primary receptors adjacent to the site. This will include asbestos monitoring and dust monitoring along the perimeters of the site (all monitoring will have approval from the Environment Agency permitting team).
 - 6.17.2 The remediation contractor will be responsible for ensuring appropriate health and safety measures are adhered to. The presence of asbestos and hydrocarbon contaminated soils has been highlighted. Both of these materials are hazardous by inhalation, and hydrocarbons can also be hazardous by contact. The site will be managed to provide segregation of "clean" and "dirty" areas with decontamination facilities for personnel and plant. All site works will be carried out in accordance with relevant guidance and approved codes of practice (ACOPs) in particular HSE guidance document "*Protection of Workers and the General Public during the Development of Contaminated Land*" to prevent pollution from associated works.
 - 6.17.3 A site induction and appropriate PPE will be mandatory to protect the health and safety of all site visitors and employees.
 - 6.17.4 The remedial works (as required) will involve the excavation, removal and replacement of soils. As with any construction project, heavy machinery will be employed during the remediation and vehicle movements to and from site will increase. It is intended to keep traffic to and from the site to a minimum by retaining as much material on site as possible.
 - 6.17.5 Working hours will be restricted to those imposed by the local Planning Department to minimise the nuisance to local residents.
 - 6.17.6 Every precaution will be taken to avoid interference with, or damage to public utilities, buildings and other services, in or near the site and also prevent the interruption or pollution of any adjoining watercourses, drains and ditches.
 - 6.17.7 The remediation contractor shall comply with all relevant Planning Conditions with respect to the execution of the works. These conditions are expected to relate mainly to environmental control issues and may take the form of, but not be limited to the following :-

- 6.17.8 Nuisance from Noise
- 6.17.9 Every precaution deemed sensible and practical to prevent nuisance to neighbouring properties due to noise will be undertaken. Such precaution shall include the fitting of efficient silencers suitable for residential areas to the exhausts of the engines of all mechanical plant employed on the site. Operations shall also be limited to Mon – Fri 7.30 am to 6 pm and Sat 8 am to 1 pm.
- 6.17.10 Noise will be regularly monitored by the contractor. All noise monitoring records shall be kept on site for inspection by regulatory authorities.
- 6.17.11 Nuisance from Dust
- 6.17.12 During the Works, all reasonable measures (including, inter alia, the use of water bowsers as necessary) will be taken to suppress dust arising from the works, in order to prevent a nuisance to neighbouring properties. A scheme for monitoring and/or suppressing dust arising from the works will be agreed with the Local Authority in writing. The primary control of dust once the structures are removed is damping and/or sheeting as appropriate.
- 6.17.13 Dust should be regularly monitored during the works. This should include the use of 'Frisbee' dust collectors. Collected dust will be sent away to the laboratory for weighing and particle sizing. Monitoring results for dust deposition will be compared to the guideline values set out in '*Suggested guidelines for deposited ambient dust*', Vallack HW and Shillito DE, Atmospheric Environment Vol 32 No. 16, pp 2732-2744, 1998. Specifically, the 'complaints possible' guideline for residential areas of 150 mg m⁻² day⁻¹ and the 'complaints likely' guideline of 200 mg m⁻² day⁻¹ are referenced. If results are consistently in excess of 150 mg m⁻² day⁻¹ this will trigger a review of procedures to further minimise dust generation. If results are consistently in excess of 200 mg m⁻² day⁻¹ this will trigger a temporary cessation of works and redesign of mitigation measures to ensure dust is properly controlled.
- 6.17.14 Nuisance from Vapours/Odours
- 6.17.15 All reasonable measures for controlling vapours and odours arising from the works in order to prevent a nuisance to neighbouring properties will be employed as necessary. Where necessary odour suppression will be used and odorous materials shall be covered with clean materials if necessary. Stockpiles of odorous contaminated soils will be kept as far away from external properties as possible during the works.
- 6.17.16 The contractor will not dispose of any materials on site by burning. Disposal of such materials shall be off site.
- 6.17.17 Fitting of Suppressors

- 6.17.18 All vehicles, excavators and other plant which operate on or near the site will be fitted with adequate electrical suppressors so that no interference is caused by them to television or radio reception in the neighbourhood.
- 6.17.19 Wheel Cleansing/Public Highways
- 6.17.20 It is not anticipated that large volumes of traffic shall be generated during the works. However, for the duration of the works, a barrier will be provided at the site entrance which prevents vehicles entering the public highway until all mud and debris is removed from the undercarriage and wheels. A mechanical sweeper will be employed as necessary to maintain clean highways in the area of the site.
- 6.17.21 No machinery used on site during the execution of the works shall be operated outside the limits of the site other than when travelling on public roads.
- 6.17.22 All vehicles carrying materials from site shall be fully sheeted before leaving the site and shall be loaded in such a way that no loose material can fall onto any highway.
- 6.17.23 Public highways shall not be used for the storage of materials or plant.
- 6.17.24 Controlled Waters
- 6.17.25 Existing borehole installations will be protected from damage during the works as far as possible.
- 6.17.26 Vehicle fuel and other potentially polluting substances shall be stored in suitable bunded secure storage areas.
- 6.17.27 Should the principal contractor or IDOM discover contaminated ground / groundwater conditions atypical of those found to date and which are suspected to pose a risk to any receptor, then further analysis and environmental monitoring will be instigated to quantify the risk (see Section 6.12 Discovery Strategy).
- 6.17.28 Surface water will be controlled by utilising the existing systems until the ground is disturbed. Once the surface has been disrupted all waters and trade effluent (excluding discharge from site accommodation) will be collected and guided to the treatment plant on site. Once treated these will be disposed of under a discharge licence. Discharge from site welfare will be disposed of in existing systems or collected by specialist carriers and transferred to handling facilities.

SECTION 7 VALIDATION REPORTING

7.1 This report sets out the appropriate stages of remediation to be adhered to during the development of the St Ann's Hospital Site. Upon completion of the groundworks, a validation report will be provided for approval and discharge of planning conditions. In summary, this will provide the following details of the remedial works undertaken:

- i.* Laboratory data relating to the chemical quality of imported soils, as well as details of placed thicknesses, sample locations and material provenance.
- ii.* Details of previously unidentified contamination and measures implemented to mitigate potential risks; Copies of analysis and monitoring records;
- iii.* Details of verification samples taken;
- iv.* Details of contamination left *in situ*;
- v.* A photographic record of key stages of works;
- vi.* Regulatory consents and permits;
- vii.* Details of waste disposal, including examples of tip tickets;
- viii.* Records of materials re-use; and
- ix.* Records of on-site testing.

SECTION 8 CONCLUSIONS

- 8.1 The site has been subject to phased investigation and a remedial strategy has been designed to ensure a safe development.
- 8.2 This document sets out the principles for the remediation and soil movement and also specifies how the works will be validated to demonstrate that the site is suitable for its intended use and that there are no significant adverse effects during the works.
- 8.3 It is necessary that this report is submitted to the Local Planning Authority (who will consult the Environmental Health Officer) and that approval of the strategy is obtained prior to commencement of development.

APPENDIX 1 ▪ Site Investigation Reports