Key Historical Feature	Distance and Bearing from Site	Date of First Appearance	Date of Last Appearance
Off-Site			
St Pancras Rail Station	150m N	1874	2021
Kings Cross Rail Station	300m NE	1874	2021
Euston Station	500m NW	1874	2021
Rail tracks (associated with the Metropolitan Railway)	500m W	1874	2021
Pancras Gasworks	550m N	1882	2000
Elizabeth Garrett Anderson Hospital	250m E	1896	2021
Goods shed and associated rail tracks	150m N	1896	1991
Institute of Ophthalmology	175m S	1916	2021
Telephone Exchange	20m NW	1953	2021
Confectionary Works	75m NW	1953	1974
Electrical Substation	200m NW	1953	1969
Milk Distributing Depot	200m SW	1953	2020
Transport Depot	200m SW	1953	1993
Works	200m S	1954	1991
Electrical Substation	250 NW	1969	2021
Car Park	150m NW	1970	1978

2.4. Unexploded Ordnance

A detailed unexploded ordnance (UXO) risk assessment has been carried out by Primely Limited, included in Appendix C. The assessment indicates that the London Borough of Camden, the borough in which the site is located, recorded between 400-499 bombs per 1,000 acres; a very high level of bombing. Luftwaffe aerial photography identified Kings Cross St Pancras Station 300m to the northeast, Euston Station approximately 500m to the west, and the City of London, a few kilometres to the south, as infrastructure and primary bombing targets.

Bomb strike records, covering the entire war period, indicate that there were two high explosive bomb strikes on site, as well as a 1kg incendiary bomb shower which may have affected the area. Bomb damage mapping notes that the buildings on site experienced *general blast damage*.

The site has been given a UXO hazard rating of *medium*. Recommended risk mitigation measures included within the assessment include a UXO risk management plan detailing actions to undertake in the event of encountering UXO and a UXO awareness briefing delivered to all personnel conducting intrusive works. For borehole, piles and trenches, intrusive magnetometer surveys at all positions to the maximum bomb penetration depth (up to 15m) is recommended.

Details of risk management strategies are outlined in CIRIA C681.

3. Geological Setting

3.1. Regional Geological Overview

The development site is located within the London Basin, which refers to an approximately triangular synclinal structure in which the sedimentary units underlying London and much of southeast England were deposited. The London Basin is comprised of the following formations, in order of decreasing depth:

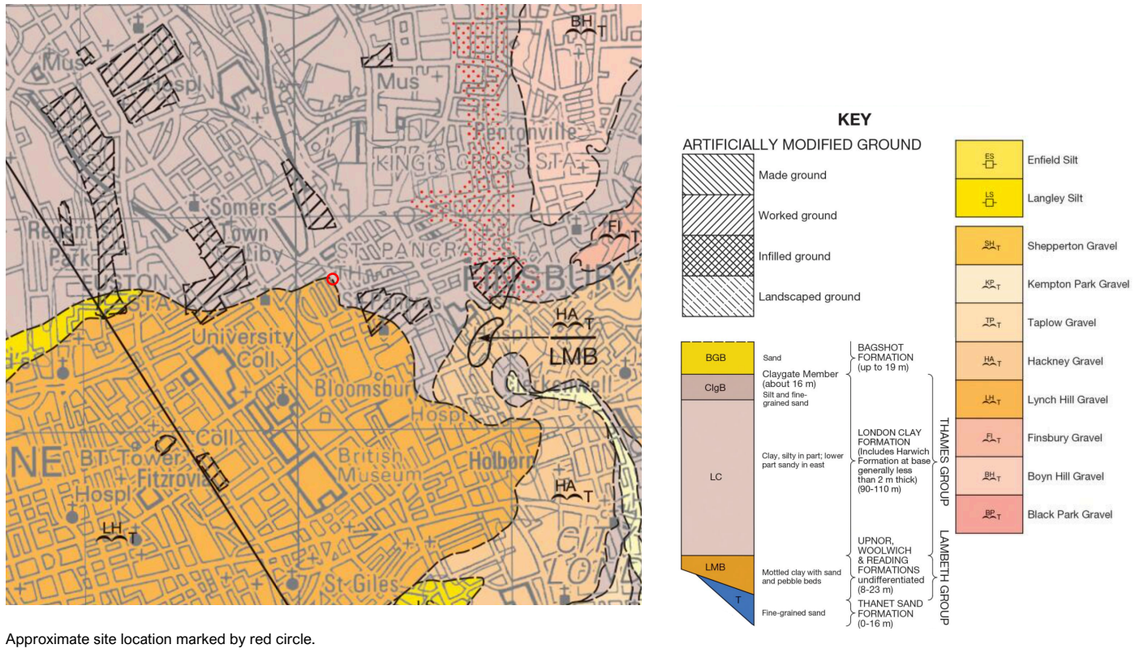
- A deep (~200m thick) layer of Chalk, deposited throughout the Upper Cretaceous period, forms the base of the basin and is the principle aquifer of the region.
- The Thanet Beds, which comprise fine, silty glauconitic sands originating in shallow seas.
- The Lambeth Group, a depositionally and geographically complex unit which comprises layers of sands and gravels, shelly and mottled clays, minor limestones and lignites, and occasional sandstone and conglomerate.
- The London Clay Formation, a fine-grained silty clay which is the dominant Thames Group Deposit.
- River Terrace Gravels, deposited by the River Thames and its tributaries on top of the London Clay.

3.2. Site Geology and Anticipated Ground Conditions

The site is located approximately at the British National Grid coordinates of 530130E, 182660N.

Figure 3.1 illustrates the location of the development within the context of a regional geological map. The map illustrates the spatial distribution of superficial (drift) and outcrops at the ground surface. Made Ground is generally not shown but is assumed to be present on site due to historical demolition and construction works. However, excavation of the current basement may have removed the majority Made Ground from previous demolition episodes.

The geology map indicates that the site is located at the northeast boundary of the Lynch Hill Gravels. The London Clay Formation is present beneath the superficial deposits and is underlain by the Lambeth Group over Thanet Sands overlying Chalk.



Approximate site location marked by red circle.

Figure 3.1 Geological context of the site

The British Geological Survey (BGS) Geology of Britain web map services provide access to the geographic locations and logs of historical borehole investigations and well installations. Historical boreholes surrounding the site are shown in Figure 3.2 and Table 3.1 presents the encountered stratigraphy from selected boreholes in close proximity to the site. Table 3.2 summarises the preliminary ground model adopted to progress the Phase I assessment.

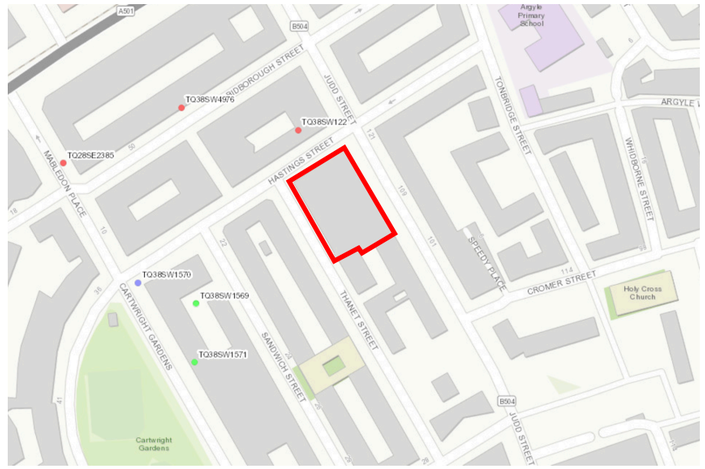


Figure 3.2 Locations of BGS boreholes in close proximity to the site boundary

Table 3.1 Encountered stratigraphy from selected BGS boreholes in close proximity to the site

Stratum	Elevation[1] (mOD)	Depth[1] (m bgl)	Thickness (m)
TQ38SW/122 – 36.57m depth, 21m northwest			
Void/Unrecorded	17.80	0.00	1.83
Stiff grey-blue silty fissured clay (*London Clay*)	15.97	1.83	17.22
Stiff brown & grey mottled fissured clay (*Lambeth Group*)	-1.25	19.05	6.70
Stiff dark grey clay with traces of limestone (*Lambeth Group*)	-7.95	25.75	0.16
Fine grey silty sand (*Lambeth Group*)	-8.11	25.91	0.30
Stiff black sandy silty clay (*Lambeth Group*)	-8.41	26.21	0.31
Stiff grey clay & limestone (*Lambeth Group*)	-8.72	26.52	0.48
Stiff brown grey & red mottled fissured clay (*Lambeth Group*)	-9.20	27.00	5.46
Firm black sandy silty clay (*Lambeth Group*)	-14.66	32.46	0.06
Stiff red & grey sandy clay (*Lambeth Group*)	-14.72	32.52	1.01
Stiff brown & grey mottle clay with green sand & limestone (*Lambeth Group*)	-15.73	33.53	1.37
Stiff grey sandy clay (*Lambeth Group*)	-17.10	34.90	Unproven
TQ38SW/1569 – 21.33m depth, 73m southwest			
Made Ground (clay, etc.)	-	0.00	0.76
Gravel and sand (*Lynch Hill Gravels*)	-	0.76	2.29
Brown fissured clay (*London Clay*)	-	3.05	0.30
Blue fissured clay (*London Clay*)	-	3.35	17.98
TQ38SW/1571 – 10.66m depth, 73m southwest			
Made Ground (concrete, brick, rubble, etc.)	-	0.00	3.05
Gravel and sand (*Lynch Hill Gravels*)	-	3.05	0.61
Brown fissured clay (*London Clay*)	-	3.66	0.30
Blue fissured clay (*London Clay*)	-	3.96	6.70

1. Elevation and depth refer to top of stratum.

Table 3.2 Preliminary ground model adopted for the Phase I assessment

Unit	Elevation[1] (mOD)	Depth[1] (m bgl)	Thickness (m)	Description
Made Ground	24.5	0.0	1.0	Variable anthropogenic deposits
Lynch Hill Gravels	23.5	1.0	2.0	Medium dense to dense sandy gravel
London Clay	21.5	3.0	22.5	Stiff brown clay with partings of silt fine sand
Lambeth Group	-1.0	25.5	Unproven	Vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels, minor limestones and lignites and occasional sandstone and conglomerate

1. Elevation and depth refer to top of stratum.

3.3. Groundwater and Hydrogeology

The preliminary evaluation of the groundwater regime has been based on data arising from the site setting, general geomorphology and relevant project experience in the area.

The groundwater model is likely to comprise a perched water table, which is sustained within the more permeable superficial strata overlying the low permeability London Clay Formation. It is anticipated that the pore water pressure distribution within the London Clay Formation is likely to be in hydrostatic equilibrium with an average or mean perched water table level. Whilst it is considered that the pore water pressure distribution within the London Clay and upper Lambeth Group clays is hydrostatic, it is likely that the lower portion of the Lambeth Group, Thanet Sands and Chalk Formation are underdrained. Due to historical dewatering from the Chalk aquifer at depth, underdrainage effects are frequently observed within the strata at depth within the London Basin.

The Groundwater Vulnerability Map of England and the Environment Agency website have been reviewed to determine the aquifer designations for the underlying geology at the site.

The Lynch Hill Gravels are classified as a Secondary A Aquifer, defined as containing permeable layers capable of supporting water supplies at a local rather than strategic scale, in some cases forming an important source of base flow to rivers. These strata are aquifers formerly classified as Minor Aquifers.

The London Clay Formation is listed as Unproductive Strata. Unproductive Strata are low permeability strata which are not considered to retain significant quantities of groundwater. If groundwater is present within Unproductive Strata, for example within more permeable lenses or small fissures, it is typically discontinuous, of low value and very low sensitivity.

Data available from historical BGS boreholes indicates that the shallow groundwater table is present at 1m below ground level.

The dominant direction of groundwater flow with the Secondary A Aquifer is anticipated to be towards the southeast i.e., towards and in the direction of flow of the River Thames located approximately 1.9 km southeast of the site.

The site is not located within a Groundwater Source Protection Zone and there are no Groundwater Source Protection Zones within 500m.

3.4. Hydrology

There are no surface water features within 500m of the site boundary.

A lost river of London, the Fleet river, is present approximately 100m to the northwest of the site boundary, based on mapping from Barton (1962).

The River Thames is located approximately 1.9 km southeast of the site.

3.5. Geological Hazards

The British Geological Survey and Environment Agency (EA) hazard mapping have identified the following potential geotechnical hazards at the site:

- *Very Low* potential for collapsible ground stability hazards.
- *No Hazard* from compressible ground stability hazards.
- *No Hazard* from ground dissolution stability hazards.
- *Very Low* potential for landslide ground stability hazards.
- *Moderate* potential for shrinking or swelling clay ground stability hazards.
- *Very Low* from running sand ground stability hazards.

3.6. Mining and Mineral Extraction

The site is not listed within the Envirocheck Report as within an area affected by coal mining.

There are no BGS Mineral Site entries listed within the Envirocheck Report within 500m of the site.

No record of mining instability, man-made mining cavities or natural cavities have been recorded within 500m.

4. Environmental Setting

4.1. Regulatory Data

Regulatory data from the Envirocheck report in close proximity to the development site (generally within 250m of the site boundary, with the exception of landfills and waste management/transfer locations which are identified within 500m of the site) has been summarised in Table 4.1 below. The most relevant information for preliminary risk assessment purposes is presented in Table 4.1. For a full breakdown of the regulatory information, refer to the Envirocheck report in Appendix B.

Table 4.1 Summary of regulatory data

Item	Distance and Bearing from Site	Information	Potential for On-site Impacts
		Agency & Hydrogeological	
Discharge Consents *Records on site*: 0 *Records within 0-250m*: 2	111m W	**Operator**: London Borough of Camden/University College London **Status**: Active **Discharge Type**: Trade discharges – cooling water **Receiving water**: GW via re-inject borehole	No (no pathway – groundwater flow direction)
Registered Radioactive Substances *Records on site*: 0 *Records within 0-250m*: 6	180m SE	**Name**: Institute of Ophthalmology **Status**: Revoked or cancelled **Process Type**: Disposal of radioactive waste	No (no pathway – groundwater flow direction)
	231m SE	**Name**: University College London **Status**: Unknown **Process Type**: Disposal of radioactive waste	
Water Abstractions *Records on site*: 0 *Records within 0-250m*: 4	71 NW	**Operator**: University College London **Status**: Active **Type**: Heat pump	No (potential receptor, not source)
		Waste and Landfill	
		No relevant records	
		Hazardous Substances	
Control of Major Accident Hazards Sites (COMAH) *Records on site*: 0 *Records within 0-250m*: 1	92m W	**Name**: London Borough of Camden **Status**: Ceased **Type**: Lower Tier	No (no pathway – groundwater flow direction)
		Industrial Land Use	
Contemporary Trade Directories	On site	**Type:** Rubbish removal (note – no indication of landfill at the site) **Status:** Inactive	Yes

Item	Distance and Bearing from Site	Information	Potential for On-site Impacts
Records on site: 1 *Records within 0-250m*: 29	14m SE	**Type:** Oil fuel distributors **Status:** Inactive	Yes
	21m W	**Type:** Medical waste disposal & electrolysis **Status:** Inactive	Yes
	45m N	**Type:** Commercial vehicle servicing, repairs, parts & accessories **Status:** Inactive	Yes
	68m E	**Type:** Dry cleaners **Status:** Inactive	No (no pathway – groundwater flow direction)
	75m W	**Type:** Chemical manufacturers, laboratories **Status:** Active	No (no pathway – groundwater flow direction)
	75m W	**Type:** Pharmaceutical manufacturers & distributors, coating specialists, laboratories **Status:** Inactive	No (no pathway – groundwater flow direction)
	100-250m all directions	**Type:** Recycling services, medical & dental laboratories, scrap metal merchants, car body repairs, distribution services **Status:** Active	Yes
	100-250m all directions	**Type:** Catering equipment, hardware, dry cleaners, electronic component manufacturers & distributors, railway equipment manufacturers, electrical engineers, rubbish clearance, photographic processors, greeting card publishers & wholesalers, petrol filling stations, airfreight services **Status:** Inactive	Yes
Fuel Station Entries *Records on site*: 0 *Records within 0-250m*: 1	225m W	**Name:** St Pancras Service Station **Status:** Obsolete	No (no pathway – groundwater flow direction)
Ecology			
No records of potentially sensitive ecological receptors as defined by the Environmental Protection Act (1990) Part 2a (as amended) have been identified.			

4.2. Flood Risk

The site is classified as having a low risk of groundwater flooding at surface level (1000-year return) and has the potential for groundwater flooding at surface and of property situated below ground level in the southwest corner of the site.

No further consideration of flood risk is given in this report. Specialist flood risk advice should be sought with regards to drainage and flooding.

4.3. Radon

The Indicative Atlas of Radon for England and Wales and the Envirocheck Report indicate that the site is within a Lower Probability Radon Area (with less than 1% of homes estimated to be at or above the Action Level). The BGS and the Building Research Establishment (BRE) Radon Guidance Document indicates that no radon protection measures are required in the construction of new dwelling or extensions in this area.

5. Proposed Development

The scheme for the consented development comprises partial demolition of internal superstructure elements, including the existing core overrun, lightwell walls and internal cross walls, as shown in Figure 5.1 below. The existing basement and façade walls will be retained, with construction proposals including new columns to replace the cross walls, a new stability system around the core, lightwell and core infills, and a two-storey roof extension formed from lightweight materials. A model of the proposed development is included as Figure 5.2. Strengthening of existing structural elements is also proposed, and any foundations to accommodate new superstructure elements will require breaking out of the existing basement slab.

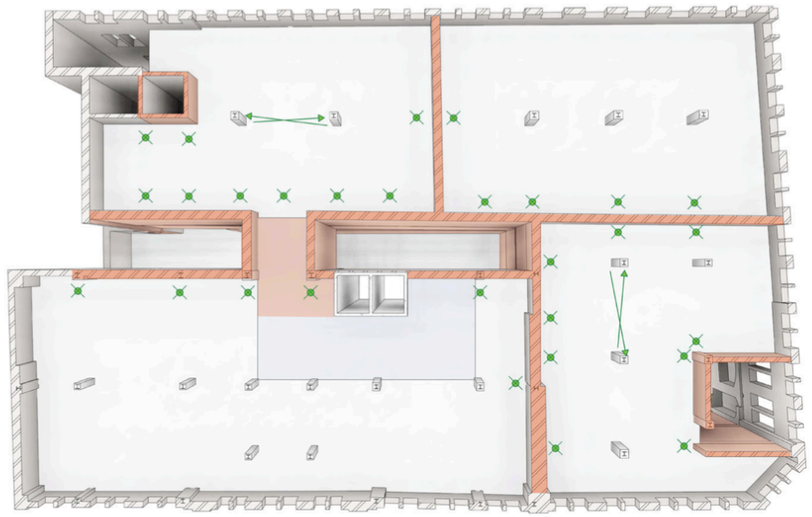


Figure 5.1 Diagram showing internal superstructure elements proposed to be demolished (orange)

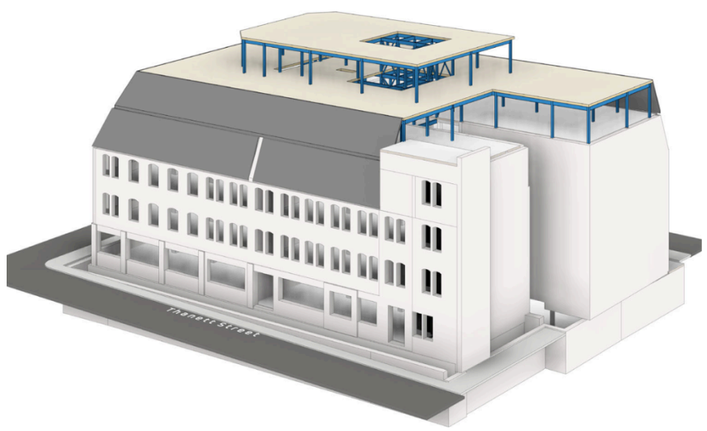


Figure 5.2 3D model of the proposed development

6. Preliminary Contaminated Land Risk Assessment

A means to qualitatively assess the risk posed by potential land contamination at a site is to develop an initial Conceptual Site Model (CSM) and carry out a Preliminary Risk Assessment (PRA). An initial CSM represents the characteristics of the site that influence the possible relationships between identified potential contaminant sources, pathways and receptors. The significance of the presence of sources, pathways and receptors is considered by carrying out the PRA for all potentially complete pollutant linkages. The PRA assessment matrix used in preparing this report is included as Appendix A. The risk assessment approach is in accordance with the principals set out in the *Land Contamination Risk Management (LCRM)* guidance, published on the UK Government website.

The PRA for the site is set out below in consideration of all the information detailed in the earlier sections of this report.

6.1. Contaminated Land Risk Assessment

6.1.1. Potential Contaminants of Concern

The potential contamination sources identified as part of this assessment are summarised in this section.

On-Site Sources

- Made Ground – heavy metals, acids / alkalis, PAHs, TPHs (inc. BTEX), asbestos, elevated sulphate and ground gases.
- Historical site use as a rubbish disposal (non-landfill) – heavy metals, acids / alkalis, PAHs, TPHs (inc. BTEX), asbestos and elevated sulphate.
- Asbestos containing materials (ACMs) in the current building fabric.

Off-Site Sources

- Historical industrial land uses (confectionary works 75m NW, milk distributing and transport depot 200m SW, electrical substation 200m NW, works 200m S, car park 150m NW, goods shed and associated rail tracks 150m N) and existing rail infrastructure associated with St Pancras/Kings Cross Station – heavy metals, PAHs, TPHs (inc. BTEX), volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), acids / alkalis, asbestos, elevated sulphate and ground gases.

Current and former nearby retail units, offices and other general commercial uses (non-industrial) are not considered potential off-site sources of contamination.

6.1.2. Potential Pathways

The potential pathways identified as part of this assessment include:

On-Site Human Health

- Direct / dermal contact / ingestion of soils at the site.
- Inhalation of ground gas, soil vapour or soils / dust at the site.
- Consumption of water from impacted water supply pipes installed as part of the proposed redevelopment.

Off-Site Human Health

- Inhalation of wind-blown dust derived from the site.
- Migration off-site via preferential pathways and / or shallow perched groundwater followed by direct contact / inhalation / ingestion of contaminated soils.
- Off-site migration of ground gas or soil vapour followed by accumulation and inhalation within neighbouring properties.
- Migration off-site via preferential pathways and / or shallow perched groundwater followed by impaction of water supply pipes and ingestion.

On-Site Buildings and Structures

- Direct contact of 'aggressive' ground and / or grossly impacted soils with building structures / foundations.
- Accumulation of ground gas or soil vapour within buildings followed by ignition.

Off-Site Buildings and Structures

- Migration off-site via preferential pathways, shallow groundwater and / or shallow perched groundwater followed by direct contact with building structures / foundations.
- Off-site migration of ground gas or soil vapour followed by accumulation within buildings and ignition.

Controlled Waters

- Leaching from the unsaturated zone.
- Perched water percolation and / or lateral migration.
- Migration via advection and diffusion in the saturated zone.
- Vertical and lateral migration of free-phase product in the unsaturated and saturated zones.

Sensitive Ecology

No relevant ecological receptors have been identified. Therefore, no potential pathways identified.

6.1.3. Potential Receptors

The potential receptors identified as part of this assessment include:

- Proposed site end users (commercial users and occasional maintenance workers).
- Off-site commercial end users (closest 15m from site in all directions) and residential end users (closest directly south of the site at 17 Thanet Street and 103 Judd Street) in the vicinity of the site in all directions. Open garden space is present immediately south of the site.
- On-site (existing and proposed) and off-site below ground structures (buried concrete and underground services).
- Controlled waters (groundwater) - Secondary A Aquifer associated with the superficial deposits anticipated beneath the site.

At this stage, any new foundation systems associated with the proposed redevelopment of the site are not anticipated to penetrate the base of the London Clay Formation.

Given the anticipated shallow groundwater flow direction beneath the site (north to south, towards the River Thames), it is considered that the Fleet river (Lost River of London - present approximately 100m to the northwest of the site) is not hydraulically connected to groundwater at the site. For the same reason, the water abstraction identified approximately 71 m northwest of the site is considered not hydraulically connected to the site. Also, given the distance to the River Thames (approximately 1.9 km to the southeast) it is considered that a viable pathway to not present between the site and the River Thames.

It is considered that risks to site workers and the environment during the construction phase of the proposed redevelopment can be appropriately managed by successful implementation of construction phase risk assessments and method statements (RAMS). The associated construction phases risks from potential contamination are not considered further in this document but should be considered in the preparation of the construction phase RAMS.

6.1.4. Summary of Source-Pathway-Receptor Contaminant Linkages

The information presented in this assessment has been compiled to produce a summary of the identified potentially complete source-pathway-receptor contaminant linkages, based on the CSM presented herein. Table 6.1 presents a Preliminary Risk Assessment (PRA) for the proposed redevelopment based on the identified potentially complete source-pathway-receptor linkages. This assessment has been performed considering the details of the proposed development presented in this report. A qualitative risk classification is provided for potentially complete source-pathway-receptor linkages in accordance with *CIRIA C552: Contaminated Land Risk Assessment, A Guide to Good Practice (Rudland et al., 2001)*. Where no potentially complete source-pathway-receptor linkage is identified then no risk classification is provided.

Table 6.1 Preliminary Risk Assessment (PRA)

Potential Site Contaminant Sources	Potential Pathways	Potential Receptors	Potential for Complete Pathway	Risk Level Classification
	Direct contact with soil	Proposed site end users (commercial users and occasional maintenance workers)	Yes (however, the site has a completely sealed surface therefore exposure is limited to occasional below ground maintenance work)	Very low
	Inhalation of windblown soil			Very low
	Ingestion of soil			Very low
	Impact to water supply pipes followed by ingestion of contaminated water supply		Yes (new pipes may be laid in impacted soils)	Low to moderate
	Ground gas / soil vapour generation and inhalation		Yes (Made Ground represents a potential source of ground gas)	Low to moderate
	Inhalation of windblown soil from the site		No (sealed surfaces at the site prevent it acting as a viable source)	No classification
On-site See Section 6.1.1	Off-site migration and direct contact with impacted soil	Off-site commercial and residential end users in the vicinity of the site as detailed in Section 6.1.2.	Yes (domestic gardens with open ground are occasionally present in the near site vicinity)	Low to moderate
	Off-site migration and ingestion of impacted soil			Low to moderate
	Impact to water supply pipes followed by ingestion of contaminated water supply		Yes (pipes may be laid in nearby soils impacted by potential contamination)	Low to moderate
	Ground gas / soil vapour generation, off-site migration and inhalation		Yes (Made Ground represents a potential source of ground gas)	Low to moderate
	Direct contact	On-site below ground structures (current and proposed)	Yes (structures may be constructed in impacted soils)	Low to moderate
	Migration followed by ignition of ground gas / soil vapour		Yes	Low to moderate

Potential Site Contaminant Sources	Potential Pathways	Potential Receptors	Potential for Complete Pathway	Risk Level Classification
			(Made Ground represents a potential source of ground gas)	
	Off-site migration followed by direct contact	Off-site below ground structures	Yes (structures may be constructed in soils impacted by potential contamination)	Low to moderate
	Off-site migration followed by migration followed by ignition of ground gas / soil vapour		Yes (Made Ground represents a potential ground gas source)	Low to moderate
	Leaching and migration to groundwater via the unsaturated zone; Perched water percolation or lateral migration; Migration via advection and diffusion in the saturated zone; and Vertical and lateral migration of free-phase product in the unsaturated and saturated zones.	Underlying Secondary A Aquifer (Lynch Hill Gravels)	Yes (shallow groundwater may be present associated with natural superficial deposits beneath the site)	Low to moderate
Off-site See Section 6.1.1	On-site migration followed by direct contact with soil	Proposed site end users (commercial users and occasional maintenance workers)	Yes (however, the site has a completely sealed surface so exposure is limited. The surrounding area is predominantly sealed surface therefore a viable source of contaminated windblown soil is not present)	Very low
	Inhalation of windblown soil from off-site			No pathway
	On-site migration followed by ingestion of soil			Very low
	On-site migration followed by impact to water supply pipes and ingestion of the water supply		Yes (pipes may be laid in soils impacted by potential off-site sources)	Low to moderate
	Ground gas / soil vapour generation, on-site migration and inhalation		Yes (potential sources of ground gas have been identified in the vicinity of the site)	Low to moderate
	On-site migration followed by direct contact	On-site below ground structures (current and proposed)	Yes (structures may be present in direct contact	Low to moderate

Potential Site Contaminant Sources	Potential Pathways	Potential Receptors	Potential for Complete Pathway	Risk Level Classification
			with soils impacted by potential off-site sources)	
	On-site migration followed by ignition of ground gas / soil vapour		Yes (potential sources of ground gas have been identified in the vicinity of the site)	Low to moderate

The PRA has identified potentially complete source-pathway-receptor linkages with a maximum **low to moderate** risk classification from the identified potential sources of contamination.

Based on the results of the PRA, it is recommended that further appropriately targeted site investigation is undertaken for geo-environmental purposes to enable a refinement of the CSM and geo-environmental risk assessments. All potentially complete pollutant linkages, as identified in the PRA, should be further investigated and assessed during the future works. The next stage of geo-environmental assessment should include a generic quantitative risk assessment (GQRA) for human health and controlled waters purposes. Appropriate assessments should also be made with respect to the proposed on-site buildings and structures, including an assessment of the risk from sulphate 'attack' to foundations. The results of the recommended further site investigation and assessments should be presented in a 'Phase II' type geo-environmental interpretive report.

The risk represented by potential ACMs in the building fabric can be addressed by commissioning an asbestos Demolition and Refurbishment Survey for the relevant areas of the current building to be demolished and / or renovated. If ACMs are identified then their onward management should be informed by an asbestos specialist, but it is considered that appropriate ACM removal will be required prior to any phases of demolition.

Design of a future geo-environmental site investigation is outside the scope of this document.

7. Closing Remarks

A2 Site Investigation Limited was appointed by Heyne Tillett Steel Ltd to prepare a geo-environmental Phase I Desk Study for the proposed development at 105-121 Judd Street, London.

The site currently houses a four-storey office building with a single-level basement over the majority of the building footprint. The scheme comprises the refurbishment of the existing structure on site, which includes partial demolition on the building interior and cores and construction of new superstructure elements. The existing basement and foundations will be reused, with minor breaking out works anticipated where any new foundations are required.

The ground conditions at the site indicate the presence of Lynch Hill Gravels superficial deposits underlain by the London Clay and Lambeth Group formations. Made Ground of variable thickness is anticipated to be present across the site based on the identified site history, although some may have been removed during former excavations for the basement.

A *medium* UXO hazard rating was identified for the project site from a detailed UXO risk assessment. It is recommended that a UXO specialist is engaged to assess the site and provide recommendations on appropriate mitigation measures and strategies.

A PRA has been carried out as part of the geo-environmental desk-based review. The PRA has identified potentially complete source-pathway-receptor linkages with a maximum **low to moderate** risk classification from the identified potential sources of contamination.

Based on the results of the PRA, it is recommended that further appropriately targeted site investigation is undertaken for geo-environmental purposes to enable a refinement of the CSM and geo-environmental risk assessments. All potentially complete pollutant linkages as identified in the PRA should be further investigated and assessed during the future works. The next stage of geo-environmental assessment should include a generic quantitative risk assessment (GQRA) for human health and controlled waters purposes. Appropriate assessments should also be made with respect to the proposed on-site buildings and structures, including an assessment of the risk from sulphate 'attack' to foundations. The results of the recommended further site investigation and assessments should be presented in a 'Phase II' type geo-environmental interpretive report.

The risk represented by potential ACMs in the building fabric can be addressed by commissioning an asbestos Demolition and Refurbishment Survey for the relevant areas of the current building to be demolished and / or renovated. It is considered that appropriate ACM removal will be required prior to any phases of demolition. If ACMs are identified then their onward management should be informed by an asbestos specialist.

This report is suitable to be submitted to the Local Authority in support of a Planning application for the proposed redevelopment. Should any details of the proposed redevelopment change from those considered herein prior to application then the assessment should be reviewed to ensure it remains appropriate prior to its submission to the Local Authority.

Appendix A: Qualitative Risk Assessment Matrix

A-squared Studio Engineers Ltd. qualitative risk assessment for geo-environmental purposes is undertaken in accordance with *CIRIA C552: Contaminated Land Risk Assessment, A Guide to Good Practice (Rudland et al., 2001)*. The CIRIA C552 risk categories and the assessment methodology are summarised below in Table A.1, Table A.2 and Table A.3. Potential magnitude and potential likelihood are both classified to enable a risk rating to be assessed.

Potential magnitude takes into account the potential consequences should a complete source–pathway–receptor linkage be present. Potential magnitude is classified as per Table A.1.

Table A.1 Definition of potential magnitude of consequence

Category	Definition
Severe	Acute risks to human health, catastrophic damage to buildings / property, major pollution to controlled waters.
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures.
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures.
Minor	Damage to non-sensitive ecosystems or species.

Potential likelihood takes into account the presence of the hazard and receptor as well as the integrity of the pathway for exposure, i.e., whether a source-pathway-receptor linkage is present or not. Potential likelihood is classified as per Table A.2.

Table A.2 Definition of potential likelihood of exposure

Category	Definition
High Likelihood	Pollutant linkage may be present and is almost certain to occur in the long-term. Or there is evidence of harm to the receptor.
Likely	Pollutant linkage may be present, and it is probable that it will occur over the long-term.
Low Likelihood	Pollutant linkage may be present, and there is a possibility that it will occur, although there is no certainty that it will do so.
Unlikely	Pollutant linkage may be present, but it is improbable that it will occur.

The potential magnitude of consequence and the potential likelihood of exposure are assessed in accordance with the risk matrix presented in Table A.3.

Table A.3 Geo-environmental risk assessment matrix

		Potential Magnitude of Consequence			
		Severe	Medium	Mild	Minor
Potential Likelihood of Exposure	High Likelihood	Very High	High	Moderate	Low to Moderate
	Likely	High	Moderate	Low to Moderate	Low
	Low Likelihood	Moderate	Low to Moderate	Low	Very Low
	Unlikely	Low to Moderate	Low	Very Low	Very Low

Appendix B: Envirocheck Report

105-121 Judd Street - Phase I Desk Study Report
11121-A2SI-XX-XX-RP-X-0001-00

Envirocheck®
LANDMARK INFORMATION GROUP®

Data Currency

Sensitive Land Use	Version	Update Cycle
Special Protection Areas Natural England	February 2021	Bi-Annually

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Data Suppliers

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	Map data
Environment Agency	Environment Agency
Scottish Environment Protection Agency	SEPA Scottish Environment Protection Agency
The Coal Authority	The Coal Authority
British Geological Survey	British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL
Centre for Ecology and Hydrology	Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL
Natural Resources Wales	Cyfoeth Naturiol Cymru Natural Resources Wales
Scottish Natural Heritage	SCOTTISH NATURAL HERITAGE
Natural England	NATURAL ENGLAND
Public Health England	Public Health England
Ove Arup	ARUP
Stantec UK Ltd	Stantec