

Appendix E Preliminary geotechnical risk register

Geotechnical hazard identification – desk study stage

Potential geotechnical hazards have been assessed in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HD 41/15 and CD 622. The following pages set out the identified geotechnical risks and hazards which are associated with the proposed development and establish the approach which is to be taken to manage the risks including the geotechnical input and analysis.

Table E.1 is a preliminary assessment of possible geotechnical hazards at the site at Desk Study stage. This information is used to assist with ground investigation design.

Table E.1: Possible geotechnical hazards

Hazard	Comment	Hazard status based on desk study	
		Could be present and / or affect site (i.e. Plausible)	Unlikely to be present and/or affect site
Uncontrolled Made Ground (variable strength and compressibility).	Significant Made Ground of unknown physical properties is likely to be present on site.	✓	-
Soft / loose compressible ground (low strength and high settlement potential).	The shallowest soils (particularly any Made Ground) may be soft and compressible.	✓	-
Shrink swell of the clay fraction of soils under the influence of vegetation.	Clay is expected to be present across the entire site.	✓	-
Variable lateral and vertical changes in ground conditions.	Made Ground will likely be present across a significant portion of the site, over superficial sand and gravels, over clays of the Lambeth Group.	✓	-
High sulfates present in the soils.	Potential for sulfates within Made Ground and natural soils.	✓	-

Adverse chemical ground conditions, (e.g. expansive slag).	No evidence based on current and historic land use of the site.	-	✓
Obstructions.	Underground services are present and obstructions associated with the existing structures are to be expected..	✓	-
Existing below ground structures to remain (on or off-site tunnels, foundations, basements, and adjacent sub-structures).	Underground services are present and obstructions associated with the existing structures are to be expected..	✓	-
Shallow groundwater.	The Lynch Hill Gravel Member and Lambeth group are Secondary A Aquifers.	✓	-
Changing groundwater conditions.	Presence of permeable sands and gravels may enable changing groundwater conditions .	✓	-
Risk from erosion.	No applicable.	-	✓
Risk from flooding.	The environmental report indicates a risk of surface water flooding of 1 in 30 years.	✓	-
Running sands and / or loose Made Ground, leading to difficulty with excavation and collapse of side walls.	Unknown nature of the Made Ground and shallow superficial deposits has potential to be loose, causing difficulties with excavation.	✓	-
Slope stability issues – general slopes.	The site is flat.	-	✓
Slope stability issues – retaining walls.	No retaining walls currently exist on the site or are planned for the development.	-	✓

Earthworks – settlement (due to placement of fill on soft / loose ground).	Earthworks are not anticipated.	-	✓
Earthworks – poor bearing capacity of new fill.	Earthworks are not anticipated.	-	✓
Earthworks – unsuitability of site won material to be reused as fill.	Earthworks are not anticipated.	-	✓
Solution features in Chalk.	A series of natural cavities are recorded in the vicinity of the site (including solution pipes and sinkholes). Further investigation is required with regard to the potential for solution features at the site.	✓	-
Cavities in the Superficial Deposits due to solution features.	A series of natural cavities are recorded in the vicinity of the site (including solution pipes and sinkholes). Further investigation is required with regard to the potential for solution features at the site.	✓	-
Dissolution (associated with “wet rock head”).	A series of natural cavities are recorded in the vicinity of the site (including solution pipes and sinkholes). Further investigation is required with regard to the potential for solution features at the site.	✓	-
Brine extraction.	Inadequate geology.	-	✓
Mining.	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered.	-	✓

Cambered ground with gulls possibly present.	Inadequate geology.	-	✓
Relict Slip Surfaces.	Inadequate geology.	-	✓
Solifluction.	Inadequate geology.	-	✓
Problematic soils (silts and rewetting etc.).	Inadequate geology.	-	✓

Appendix F Plausible source-pathway-receptor contaminant linkages

Summary of potential contaminant linkages

Table F.2 lists the plausible contaminant linkages which have been identified. These are considered as potentially unacceptable risks in line with guidelines published in LCRM (2019) and additional risk assessment is required.

Source – Pathway – Receptor Linkages have been assessed in general accordance with guidance in CIRIA Report C552 (Rudland *et al* 2001) but modified to add a 'no linkage' category and to remove low/moderate risk (See Table F.1).

It should be noted that whilst the risk assessment process undertaken in this report may identify potential risks to site demolition and redevelopment workers, consideration of occupational health and safety issues is beyond the scope of this report and need to be considered separately in the Construction Phase Health and Safety Plan.

Table F.1: Consequence versus probability assessment.

		Consequence			
Probability		Severe	Medium	Mild	Minor
	High Likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Low risk	Very low risk
	Low Likelihood	Moderate risk	Low risk	Low risk	Very low risk
	Unlikely	Low risk	Very low risk	Very low risk	Very low risk
	No Linkage	No risk			

Table F.2: Exposure model – final source-pathway-receptor contaminant linkages

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments	
Made Ground, associated with historical construction activities and imported fill, possibly including elevated concentrations of metals, metalloids, asbestos, PAH and petroleum hydrocarbons (S1).	Ingestion, inhalation or direct contact (P01).	People (neighbours, site end users) (R01).	Likely	Medium	Moderate	There is likely Made Ground below the site with the development of the existing structures on site and demolition of older structures/	Contact with these materials is likely. Intrusive investigation is required to assess the risk.
	Direct contact with substances deleterious to building materials (P02).	Development end use (buildings, utilities and landscaping) (R02).	Likely	Medium	Moderate		Contact with these materials is likely.
	Inhalation of fugitive dust (P01).	People (neighbours, site end users) (R01).	Low likelihood	Medium	Low		The risk of significant generation of dust is likely only during site development process and can therefore be controlled.
	Leachate migration through the unsaturated zone (P06).	Groundwater: Secondary A aquifer status of the Lynch Hill Gravel Member and Lambeth Group (R03).	Likely	Medium	Moderate		Potential for contaminants to leach through the unsaturated zone of the permeable superficial deposits. Further investigation is required.

	Migration of contaminants to the Secondary A aquifer (P07).	Groundwater: Secondary A aquifer status of the Lynch Hill Gravel Member and Lambeth Group (R03).	Low likelihood	Medium	Low		
	Root uptake (P05)	Development end use (buildings, utilities and landscaping) (R02).	Likely	Medium	Moderate		Risk of contaminated Made Ground to impact soft landscaping areas of the development needs further investigation
Ground gases (carbon dioxide and methane) from organic materials in the Made Ground (S02)..	Methane ingress via permeable soils and/or construction gaps (P03/4).	People (neighbours, site end users) (R01).	Likely	Medium to Severe	Moderate to High	Made Ground is anticipated on site which may contain organic materials. Site investigation to confirm the conditions is required. Gas monitoring will be required if potential gas generating Made Ground is encountered.	
Asbestos within existing buildings (S03).	Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).	People (site end users) (R01). People (neighbours,) (R01)..	Likely Unlikely	Severe Severe	High Low	Asbestos may be present in existing buildings and in Made Ground. Careful removal will be required from buildings during demolition. However, removal under controlled conditions should limit release of fibres to the air and the ground.	