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REMEDIAL STRATEGY
AND
VERIFICATION PLAN

FOR

PROPOSED DEVELOPMENT AT
BEACHES YARD, HORTON ROAD, WEST DRAYTON, UB7 8HX

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Report Title: **Remedial Strategy & Verification Plan for Beaches Yard, Horton Road, West Drayton, UB7 8HX**

Report Status: **Final v1.0**

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QUALITY CONTROL – REVISIONS

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1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Harvest Land Management Group Ltd ("The Client"), has commissioned Jomas Associates Ltd ('Jomas') to produce a remedial strategy prior to the development of Beaches Yard, Horton Road, West Drayton, UB7 8HX.

1.2 Site Information

1.2.1 The site is currently used for semi-permanent residential units and storage of vehicles.

1.3 Proposed Development

1.3.1 The proposed development is understood to comprise the construction of a new warehouse. It is understood that the proposed structure will be 18-21m high and includes a half-basement. Extensive areas of soft landscaping are not anticipated.

1.4 Background

1.4.1 At time of writing, it is understood that a planning application for the proposed development is yet to be submitted to the London Borough of Hillingdon.

1.4.2 However, given the known history of the site, it is anticipated that planning consent would include conditions relating to contaminated land assessment.

1.4.3 This report has been produced to address the anticipated requirement for a remediation strategy.

1.5 Objectives

1.5.1 The primary objectives of this document are as follows:

- To provide information on the site setting; identify ground conditions and potential environmental risks associated with the development.
- To provide an assessment of various options for remediation.
- To set out the remediation strategy that will provide a site that is suitable for the intended use and addresses any identified unacceptable risks.
- To provide relevant information to address anticipated planning conditions relating to contaminated land. A separate verification report will be required following the implementation of the remediation strategy.

1.5.2 The primary remediation objective is the mitigation of the risks associated with the presence of elevated polyaromatic hydrocarbons and asbestos in the Made Ground beneath the site.

1.5.3 This document provides an assessment of potential remedial strategies and describes the methodology for the proposed remedial action.

1.5.4 The remediation strategy and associated remediation criteria have been developed with reference to previous works carried out at the site. The remediation criteria used to develop the proposed remediation strategy will be used for the proposed verification works.

1.5.5 The Principal Contractor will be responsible for implementing the appropriate methodology and site management procedures to achieve the required outcome and comply with these principles.

1.5.6 The works will be undertaken by experienced personnel and will be managed in accordance with the Contractor's Construction Environmental Management Plan. Detailed construction method statements will be prepared for the impacted soil removal works. Jomas will be employed as Environmental Specialist, to supervise the works and undertake soil sampling and analysis as part of the validation process.

1.6 Previous Reports

1.6.1 The previous reports that have been utilised by Jomas for the purposes of this document comprise:

- Desk Study/Preliminary Risk Assessment Report for Land Adjacent to Beaches Yard, Horton Road, West Drayton, UB7 8HX, P4398J2568/TE, 31 May 2022, Jomas Associates Ltd.
- Geo-environmental & Geotechnical Assessment Ground Investigation Report for Beaches Yard, Horton Road, West Drayton, UB7 8HX, P4398J2568/JWT, 15 July 2022, Jomas Associates Ltd.

1.6.2 This document should be read in conjunction with the above reports.

1.7 Limitations

1.7.1 Jomas Associates Ltd ('Jomas') has prepared this report for the sole use of Harvest Land Management Group Ltd, in accordance with the generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon by any other party without the explicit written agreement of Jomas. No other third party warranty, expressed or implied, is made as to the professional advice included in this report. This report must be used in its entirety.

1.7.2 This report provides an overview of conclusions drawn from previous investigations, some of which has been conducted by others. Third party information used is assumed to be correct, and Jomas has not validated any of the data provided. Jomas is unable to guarantee the accuracy of the information provided by others.

2 LAND CONTAMINATION OVERVIEW

2.1 Desk Study Findings

2.1.1 A Desk Study (Jomas, May 2022) has been produced for the site and issued separately. A brief overview of the findings is presented below. Reference should be made to the full report for detailed information.

- A review of the earliest available historical mapping (1866) indicates the site was undeveloped and devoid of features at that time. By the 1890s, the site formed part of a large gravel pit, with various associated ground workings and a small railway crossing the site. The railway is no longer shown in the maps dated 1913-1914. By 1935 the gravel pit is no longer indicated, however, the ground workings are still evident on the site. A small building is also shown present adjacent to the western boundary at the time. Since the 1970's significant features or structures have not been identified on the site.
- The historical mapping indicates that the site surrounds were also used for mineral extraction in the late 1800's and early 1900's with a number of brickfields and gravel pits shown in the area. The gravel pits appear to have largely been infilled by the early 1960's. During the 1960's and 1970's numerous works, depots and warehouses were constructed immediately to the west of the site. This area continues to be occupied by light industrial units, although some of them have since been modernised.
- The British Geological Survey indicates that the site is located in an area of infilled ground. This is believed to relate to the historical backfilling of the gravel pit that was previously present on the site. Underlying the infilled ground are superficial deposits of the Lynch Hill Gravel Member, which in turn are underlain by solid deposits of the London Clay Formation. Due to the historical mineral extraction the Lynch Hill Gravel Member may be absent, or its thickness significantly reduced beneath the site.
- The superficial deposits underlying the site are identified as a Principal aquifer, with the underlying solid deposits classified as Unproductive stratum.
- A review of the Enviro+GeoInsight Report indicates that there are no groundwater source protection zones within 500m of the site.
- There are 5No potable abstractions within 2km; the nearest of which is located circa 1.5km north of the site.
- There are 2No surface water features (ponds) within 250m of the site. The Grand Union Canal is located roughly 300m south of the site.
- There are no Environment Agency Zone 2 or 3 floodplains reported within 50m of the site.
- The site is located on a historical landfill known as Stockley Park. The records indicate that the landfill was licensed to accept inert, industrial, commercial, household and special wastes including liquid sludge. Historical landfills are also shown to the south and east of the site.

2.2 Intrusive Investigation

2.2.1 The ground investigation was undertaken between 31 May and 01 June 2022, and consisted of the following:

- 5 No. window sampling boreholes (WS1-WS5), drilled up to 5.45m below ground level (bgl), with associated in-situ testing and sampling;
- 2 No. cable percussion boreholes (BH1-BH2), drilled up to 25m bgl, with associated in-situ testing and sampling;

- 3 No. gas and groundwater monitoring well installations, extending up to 5m bgl;
- Laboratory analysis for chemical and geotechnical purposes;
- 4No. return visits to monitor ground gas concentrations and groundwater levels.

2.2.2 The results of the ground investigation revealed a ground profile comprising a variable thickness of Made Ground (including suspected landfill material) to depths of up to 7.8m bgl, underlain by loose to medium dense sand and gravels of the Lynch Hill Gravel Formation, to depths of up to 9.2m bgl, underlain by stiff becoming very stiff clay of the London Clay Formation to the base of the boreholes (maximum depth of 25m bgl). The base of the London Clay Formation was not proven.

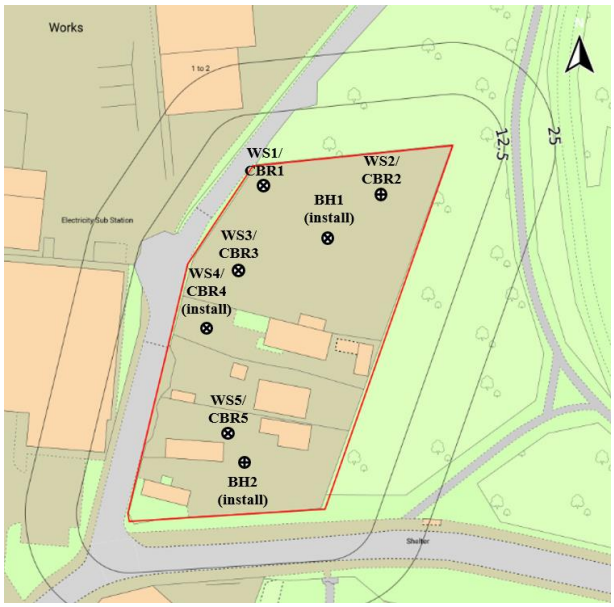
2.2.3 A strong hydrocarbon odour was noted in the Made Ground in exploratory location BH2 at a depth of 3.5m- 5.3mbgl.

2.2.4 Possible asbestos containing materials (ACMs) were noted in the Made Ground in exploratory location BH2 (0.0m – 1.1mbgl).

2.2.5 Black staining was noted in the Made Ground in exploratory locations WS3 (1.6m – 5.45mbgl) and WS4 (1.1m – 4.0mbgl) .

2.2.6 Groundwater was reported during the drilling process in BH1 at 2.70m bgl (rose to 2.40m bgl after 20 minutes) and in BH2 at 2.60m bgl (rose to 2.10m bgl after 20 minutes). During return monitoring groundwater was reported at depths of between 1.07m and 2.82m bgl, within wells extending to 5.33mbgl.

2.2.7 Figure presented below, shows location of exploratory holes: BH1 - BH2 and WS1 - WS5.



2.3 Soil Gas Risk Assessment

2.3.1 Gas monitoring undertaken as part of the ground investigation (Jomas, July 2022) recorded concentrations of carbon dioxide consistently in excess of 5% (up to 20.2% v/v), and methane consistently in excess of 1% (up to 30.8% v/v). It should be noted that flow rates were negligible (up to a maximum 0.2 l/hr). On this basis a site classification of CS2 was considered appropriate. Installation of suitable gas protection measures in accordance with BS8485 (2015) + A1 (2019) will be required for the proposed development.

2.4 Controlled Waters Risk Assessment

2.4.1 Although during the ground investigation a limited number of contaminants were reported within groundwater in excess of generic assessment criteria, a significant impact to controlled water receptors was not considered to exist.

2.5 Human Health Risk Assessment

2.5.1 Following a review of the ground investigation report (Jomas, July 2022), the following factors pertaining to human health are noted:

- The proposed development is understood to comprise the construction of a new warehouse. We understand that the proposed structure will be 18-21m high and includes a half-basement. Extensive areas of soft landscaping are not anticipated.
- Following generic risk assessments, elevated concentrations of benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene were detected in the Made Ground soils above the generic assessment criteria for the protection of human health within a 'Commercial' end-use scenario. These soils are not considered suitable within soft landscaped areas.
- Asbestos in the form of amosite (loose fibrous debris and sheeting/board debris) and chrysotile (woven product (belt)) was detected within 3No out of the 8No samples analysed in the laboratory. The results of quantification analysis indicate fibre concentrations up to 0.001%. This is below the threshold of 0.1%, above which soil arisings containing asbestos, are considered hazardous for the purpose of disposal to landfill. There is no safe concentration of asbestos for the protection of human health, and measures will be required for the protection of end users and construction workers.
- The risk to end users associated with vapour risk inhalation from soils was considered to be negligible.
- In addition, concentrations of zinc and copper identified within the Made Ground samples may be detrimental to plant growth.
- Health and Safety measures will be required for the protection of construction workers.

2.6 Impact to Neighbouring Properties and Buried Services

2.6.1 Screening of levels of determinands potentially affecting water pipes identified exceedances relating to a single total petroleum hydrocarbon fraction (TPHCWG Aromatic >C12-C16), therefore upgraded pipework may be required.

2.6.2 Requirements for potable water supply pipework should be confirmed with the relevant utility provider at an early stage of the project life cycle.

2.7 Conceptual Site Model (CSM)

2.7.1 The updated CSM is presented in Table 2.1 overleaf.

Table 2.1: Plausible Pollutants Linkages Summary (Pre-Remediation)

Potential Source (from desk study)	Pathway	Receptor	Relevant Pollutant Linkage?	Comment
• Potential for contaminated ground associated with previous site uses – on site (S1) Brick field (1897) ○ Railway sidings (1894 – 1898) Unspecified pit (1894 – 1898) ○ Gravel pit (1913 – 1932) Ballast pit (1938) Unspecified heap (1938) ○ Unspecified commercial/ industrial (1935) ○ Unspecified ground workings (1935 – 1970) • Potential infilled ground – on site (S2) ○ Stockley Park landfill (until 1993) ○ Gravel pits (1894 – 1935) ○ Brick field (1897) ○ Unspecified pit (1894 – 1898) ○ Water body/pond (1882 – 1938) ○ Unspecified ground workings (1935 – 1970) ○ Ballast pit (1938) ○ Unspecified heap (1938)	• Ingestion and dermal contact with contaminated soil (P1) • Inhalation or contact with potentially contaminated dust and vapours (P2) • Permeation of water pipes and attack on concrete foundations by aggressive soil conditions (P6)	• Construction workers (R1) • Maintenance workers (R2) • Neighbouring site users (R3) • Future site users (R4) • Building foundations and on site buried services (water mains, electricity and sewer) (R5)	**Y**	See section 9.1 above for remedial measures. The findings of this report should be included in the construction health and safety file, with adequate measures put in place for the protection of construction and maintenance workers. Contact should be made with relevant utility providers to confirm if upgraded materials are required. The concrete classification to protect buried concrete is discussed in Section 10.3 of the Geo-environmental and Geotechnical Assessment Report.
	• Accumulation and migration of soil gases (P5)		**Y**	Gas protection measures are required in accordance with CS2 classification.
• Potential for contaminated ground associated with current and previous site uses – off site (S3) ○ Unspecified works, 7m north-west (1970 – present) ○ Unspecified depot, 9m west (1970 – present) ○ Stockley Trident Landfill, 17m south (until 1993) ○ Rico Logistics (distribution and haulage), 41m west ○ Unspecified tank, 44m south (1980)	• Leaching through permeable soils, migration within the vadose zone (i.e., unsaturated soil above the water table) and/or lateral migration within surface water, as a result of cracked hardstanding or via service pipe/corridors and surface water runoff. (P3) • Horizontal and vertical migration of contaminants within groundwater (P4)	• Neighbouring site users (R3) • Building foundations and on site buried services (water mains, electricity and sewer) (R5)	**N**	A significant impact to controlled water receptors has not been identified. The concrete classification to protect buried concrete is discussed in Section 10.3 of the Geo-environmental and Geotechnical Assessment Report. .

Table 2.1: Plausible Pollutants Linkages Summary (Pre-Remediation)

Potential Source (from desk study)	Pathway	Receptor	Relevant Pollutant Linkage?	Comment
		• Controlled waters (R6) - Principal aquifer, on site - Surface water features within 250m of site - Grand Junction Canal, ~300m south		

3 REMEDIAL OPTIONS APPRAISAL

3.1.1 Excavation and disposal

- Made Ground displaying elevated concentrations of contaminants may be excavated for disposal off site, with the importation of a respective thickness of certified clean material to restore site level. However, given the thickness of Made Ground encountered onsite (up to 7.8m bgl), this is considered unsuitable and impracticable.
- In addition, costs and vehicle movements required for such an operation would likely render the costs associated with this method prohibitive.

3.1.2 Encapsulation

- In order to sever the identified pathways to the most sensitive receptors (human health), encapsulation of impacted materials below building footprints or areas of hardstanding may be undertaken. This would have the effect of removing the potential pathways of direct contact and inhalation.
- It is not anticipated that areas of extensive soft landscaping will be present as part of the final development. Should such features be proposed, the impacted soils will be encapsulated by the use of a capping layer. This should comprise a minimum 450mm thickness of clean cover layer (i.e. topsoil over cohesive subsoil), laid over a geotextile membrane.

3.1.3 Dust control measures will be required during the undertaking of all the remedial options identified above for the protection of site workers.

3.1.4 When issues of practicality, cost effectiveness, requirements for vehicle movements etc. are taken into account, it is recommended that encapsulation of impacted soils is adopted as the preferred remedial methodology.

3.1.5 The requirements for the remedial methodology are presented within Section 4 of this report.

4 PROPOSED REMEDIATION STRATEGY

4.1 Introduction

4.1.1 The proposed remediation scheme serves to address the potential unacceptable risks identified in the context of the proposed redevelopment of the site.

4.1.2 The remedial measures comprise:

- The encapsulation of impacted soils below areas of building footprint or hardstanding.
- A watching brief following demolition and during enabling works.
- Gas protection measures incorporated within the buildings on-site.
- Installation of appropriate utility pipework in accordance with supplier's guidelines.
- Within any potential areas of soft landscaping, a cover layer comprising a minimum 450mm thickness of clean topsoil and subsoil over a geotextile membrane/marker layer will be utilised.
- Validation testing will be undertaken upon soils imported to site to confirm their suitability for use as a clean capping layer.

4.2 Remediation Strategy

Ground Gas Mitigation Measures

4.2.1 Gas monitoring undertaken as part of the ground investigation (Jomas, July 2022) recorded concentrations of carbon dioxide consistently in excess of 5% (up to 20.2% v/v), and methane consistently in excess of 1% (up to 30.8% v/v). It should be noted that flow rates were negligible (up to a maximum 0.2 l/hr). On this basis a site classification of CS2 was considered appropriate. Installation of suitable gas protection measures in accordance with BS8485 (2015) + A1 (2019) will be required for the proposed development.

4.2.2 In the assessment of risks posed by hazardous ground gases and selection of appropriate mitigation measures, BS8485 (2015) + A1 (2019) identifies four types of development, termed Type A to Type D.

4.2.3 Type D buildings are defined as

> *"industrial style building having large volume internal space(s) that are well ventilated. Corporate ownership with building management controls on alterations to the ground floor and basement areas of the building and on maintenance of ground gas protective measures. Probably civil engineering construction. Examples are retail park sales buildings, factory shop floor areas, warehouses. (Small rooms within these style buildings should be separately categorized as Type B or Type C)."*

4.2.4 Type D has been adopted as the relevant category for the majority of the proposed development. As indicated above some small areas will need to be categorised separately as Type C.

4.2.5 The methodology set out in BS 8485 (2015) has been used for determining the required gas protection measures. For Type D development on a CS2 site the gas protection measures must

provide a minimum of 1.5 points. For any areas of the proposed development which would constitute Type C, the gas protection measures must provide a minimum of 2.5 points.

4.2.6 This can be achieved in a number of ways, within BS8485 it is recommended that a range of protection measures are utilised with a minimum of two separate methods chosen from the three groupings (structural, ventilation and barrier).

Table 4.1: Recommended Gas Protection Measures

Protection Measures	BS 8485 Score
Structural	
Cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations	**1.5**
Ventilation	
Pressure relief pathway	**0.5**
Or	
Passive sub floor dispersal layer of:	
• Very good performance:	**2.5**
• Good performance:	**1.5**
Barrier	
Gas resistant membrane meeting all of the following criteria: • sufficiently impervious to the gases with a methane gas transmission rate <40.0 ml/day/m2/atm (average) for sheet and joints (tested in accordance with BS ISO 15105-1 manometric method); • sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions; • sufficiently strong to withstand in-service stresses (e.g. settlement if placed below a floor slab); • sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc); • capable, after installation, of providing a complete barrier to the entry of the relevant gas; and • verified in accordance with CIRIA C735	**2**
MINIMUM REQUIRED TOTAL — **Type D Areas**	**1.5**
MINIMUM REQUIRED TOTAL — **Type C Areas**	**2.5**

4.2.1 As outlined in the table above, the minimum 1.5 gas protection points required for a Type D development on a CS2 site could be achieved through incorporation of a cast in situ monolithic reinforced ground bearing raft, or reinforced cast in situ suspended floor slab with minimal penetrations, as part of the proposed development.

4.2.2 For any Type C areas of the proposed development, a minimum 2.5 gas protection points is required, and could be readily achieved by way of the installation of a gas resistant membrane, or a passive sub floor dispersal layer with minimum 'good performance', within these areas of the proposed development in addition to the cast in situ floor slab mentioned above.

4.2.3 The media used to provide the dispersal layer can vary, but commonly are formed using either clear void; a polystyrene void former blanket; a geocomposite void former blanket; a no-fines gravel layer with gas drains or a no-fines gravel layer. In designing the ventilation layer, the ventilation effectiveness of different media needs to be taken into consideration. The effectiveness of the ventilation layer depends on a number of different factors including the transmissivity of the medium, the width of the building, the side ventilation spacing and type and the thickness of the layer.

4.2.4 During construction where personnel are required to enter excavations of greater than 1.2m the air quality (carbon dioxide, methane and oxygen concentrations as a minimum) should be regularly checked prior and during person entry. Appropriate precautions, including but not limited to, venting, PPE and gas alarms should be undertaken.

4.2.5 Any permanent excavations such as manholes, inspection chambers or other void spaces formed beneath the sites ground surface are potential ground gas traps and precautions, as per above, are considered the minimum necessary prior to person entry.

4.2.6 The installation of the ground gas protection measures shall be verified by a competent person in accordance with CIRIA C735.

Impacted Soils Encapsulation

4.2.7 Following removal of hardstanding etc, any visible asbestos materials are to be removed by a specialist contractor by a hand picking operation, and double bagged for disposal. Dust control measures will also be required. This may comprise the damping down of excavations. It is noted that asbestos fibres will not be visible to the naked eye.

4.2.8 Where buildings or hardstanding are proposed, no formal remedial works are considered necessary, beyond the hand picking discussed above, and the construction of the building/hardstanding, as this should provide an appropriate barrier to impacted soils

4.2.9 Within areas of soft landscaping, soils will be encapsulated below a cover layer of imported clean topsoil and subsoil . The cover layer should have a minimum overall thickness of 450mm and comprise 150mm topsoil over 300mm cohesive subsoil laid over a geotextile membrane.

4.2.10 Where topsoil and sub-soil is imported to the site, the soil should be chemically suitable for use. All imported soil should conform to the following chemical specification:

Table 4.2: Topsoil and Subsoil Requirements

Determinand	Unit	Screening Criteria	
Arsenic	mg/kg	S4UL	37
Boron	mg/kg	S4UL	290
Cadmium	mg/kg	S4UL	11
Chromium	mg/kg	S4UL	910
Lead	mg/kg	C4SL	200
Mercury	mg/kg	S4UL	40
Nickel	mg/kg	BS3882	110
Selenium	mg/kg	S4UL	250
Copper	mg/kg	BS3882	200
Zinc	mg/kg	BS3882	300
Asbestos	%	S4UL	None Detected

Determinand	Unit	Screening Criteria	
pH	-	S4UL	5-9
Naphthalene	mg/kg	S4UL	2.3
Acenaphthylene	mg/kg	S4UL	170
Acenaphthene	mg/kg	S4UL	210
Fluorene	mg/kg	S4UL	170
Phenanthrene	mg/kg	S4UL	95
Anthracene	mg/kg	S4UL	2400
Fluoranthene	mg/kg	S4UL	280
Pyrene	mg/kg	S4UL	620
Benzo(a)anthracene	mg/kg	S4UL	7.2
Chrysene	mg/kg	S4UL	15
Benzo(b)fluoranthene	mg/kg	S4UL	2.6
Benzo(k)fluoranthene	mg/kg	S4UL	77
Benzo(a)pyrene	mg/kg	S4UL	2.2
Indeno(123-cd)pyrene	mg/kg	S4UL	27
Dibenzo(ah)anthracene	mg/kg	S4UL	0.24
Benzo(ghi)perylene	mg/kg	S4UL	320
TPH C_5-C_6	mg/kg	S4UL	42
TPH C_6-C_8	mg/kg	S4UL	100
TPH C_8-C_{10}	mg/kg	S4UL	27
TPH C_{10}-C_{12}	mg/kg	S4UL	74
TPH C_{12}-C_{16}	mg/kg	S4UL	140
TPH C_{16}-C_{21}	mg/kg	S4UL	260
TPH C_{21}-C_{35}	mg/kg	S4UL	1100

4.3 Utility Pipework

4.3.1 The type of utility pipework to be installed on site should be discussed and agreed with the relevant utility supplier prior to installation.

4.4 Health and Safety / PPE

Excavations will have suitable barriers and access points, with pedestrian routes clearly marked. Appropriate safety signage and instructions will be clearly visible, with accesses to be kept clear of debris, materials and cables.

Operatives will be briefed on sharps protection in order to ensure safety. Clean/dirty rooms will be provided for operatives working within contaminated areas

4.4.1 Standard PPE will be required at all times, namely:

- Hard hat
- Safety spectacles
- Hi-viz waistcoat or jacket
- Gloves

- Boots or shoes with steel toe and midsole protection

4.4.2 Other items may be required as per detailed in the specific method statement;

- Harness
- Dust protection
- Ear protection
- Other specialist equipment

4.4.3 A method statement will be produced by the chosen contractor.

4.5 Unexpected Contamination

4.5.1 To accord with best practice if, during the construction of the development, contamination and/or materials not previously identified are found to be present at the site, then no further development (unless otherwise agreed in writing with the Local Planning Authority) shall be carried out until Jomas' (or qualified geo-environmental engineer) has been informed, and a suitable strategy implemented to the approval of the engineer and/or the Local Planning Authority.

4.5.2 Examples of such materials include:

- buried drums, tanks, pipework or containers
- soil or water with colour or odour
- non-natural materials and wastes
- other evidence of contamination, for example iridescent sheens (like oil or diesel) on soil or water.

4.6 Operational Standards – Summary

4.6.1 As a minimum, the following standards shall be employed during the full course of this remediation site works;

- All materials subject to excavation and disposal must be tracked throughout and evidence generated to provide an auditable trail.
- Any excavated soils will be stockpiled/stored in a designated area on site, with plastic sheeting placed at ground surface to prevent cross-contamination. The contractor shall be responsible for the removal of spoil from the site.
- Personal protective equipment shall be employed by all site remediation and ground worker personnel in accordance with site specific risk assessments. These are to be completed by all contractors following consideration of the potentially hazardous properties of contaminants within the site.
- A copy of this remediation statement together with all previous geo-environmental assessment reports shall be retained on site for reference during the full course of remediation activities.

5 VERIFICATION PLAN

5.1 Proposals for Validation & Verification

5.1.1 A qualified environmental engineer shall undertake the following tasks to monitor the remedial activities described in this statement.

- Following importation of topsoil and subsoil to site, representative samples will be obtained prior to laying of the material. It is anticipated that 1No sample will be taken per 100m^3 of imported soil or a minimum of 3 samples (whichever is greater).
- The thickness of the clean cover layer and the presence of a geotextile/marker layer will be verified by a series of hand dug pits in areas of soft landscaping, with accompanying photographs.
- These samples shall be sent directly to an MCERTS and UKAS accredited laboratory for testing.
- The results will be screened against the criteria given previously within Table 4.2, which comprise S4UL generic assessment criteria (suitable for use levels for human health risk assessment) published by the Chartered Institute of Environmental Health (CIEH). Where these are not available, other available general assessment criteria (GAC), including the Category 4 Screening Levels (C4UL) published by DEFRA have been used.
- Installation of the gas protection measures should be verified by a suitably qualified engineer in accordance with the methodology set out in CIRIA C735.

5.2 Remediation Verification/Completion Report

5.2.1 The Remediation Completion Report shall include the following information:

- Summary of all works undertaken.
- Photographic log of the works.
- A full chemical soil analysis results schedule.
- Full details of any further contamination reported during construction works.
- Disposal documentation for any spoil or asbestos materials spoil.

5.3 Reporting

5.3.1 All activities will be documented (including photographs) to show compliance with the Remediation Strategy. This documentation will be kept on site at all times during the works and updated daily as part of a field record as the works progress, which would be available for regulatory inspection at any time. All documentation would be included in a final verification report to be presented to the Local Authority.

6 REFERENCES

- A possible approach for generating site specific assessment criteria for polycyclic aromatic hydrocarbons (draft internal HPA briefing note)
- CIEH & CL:AIRE (2008) *Guidance on comparing soil contamination data with a critical concentration*. London: Chartered Institute of Environmental Health (CIEH) and CL:AIRE
- Desk Study/Preliminary Risk Assessment Report for Land Adjacent to Beaches Yard, Horton Road, West Drayton, UB7 8HX, P4398J2568/TE, 31st May 2022, Jomas Associates Ltd.
- Environment Agency (19 April 2021) Land Contamination: Risk Management [online]. URL: www.gov.uk/government/publications/land-contamination-risk-management-lcrm
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