



MAITLAND PARK VILLAS AND TRA HALL, CAMDEN

REMEDIATION STRATEGY

Carried out for:




Bouygues UK Limited
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February 2021

Report No R9203/004

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February 2021

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SUMMARY

This Remediation Strategy details the remedial measures required to ensure the completed development at Maitland Park Villas and TRA Hall, Camden, NW3 2EH (the site) is suitable for use.

Contaminants of concern (asbestos, lead, PAH compounds and hydrocarbons) have previously been identified within the shallow Made Ground at levels that may pose unacceptable risks to future site users. The primary exposure pathway for the contaminants of concern is via direct contact, ingestion and inhalation of particles / fibres, rather than indoor vapour inhalation. Therefore, remediation will be required to break the exposure pathway, through the installation of hardstanding or a clean cover system comprising a minimum of 600 mm within private and communal residential gardens. A reduced depth of clean cover 450 mm is required within the public open space (Grafton Green) portion of the site. The cover is to comprise validated clean imported topsoil and subsoil over a geotextile marker layer within all areas of soft landscaping within the blue line Bouygues construction site boundary.

The installed clean cover will be validated and verified as compliant with the requirements of the Remediation Strategy by an independent environmental consultant, such as SOCOTEC.

The red line planning site boundary extends further to the south, however, as no works are proposed outside of the Bouygues construction site, the Local Planning Authority has updated the Planning Condition (number 8) relating to Contaminated Land to allow a partial discharge for the assessment and remediation within the blue line construction site boundary.

Additional soil sampling and assessment of the in-situ soils within the Grafton Green portion of the site, which have so far been subject to limited assessment, may allow for a redesign of the clean cover. However, any changes would be subject to the risk assessment of the results of an adequate density (minimum of one sample per 25 m²) of sampling and require approval by the Local Contaminated Land Officer.

The Remediation Strategy includes a Verification Plan detailing the information required for subsequent inclusion in a Verification Report to be produced by Bouygues or an independent environmental consultant, such as SOCOTEC.

1 INTRODUCTION

1.1 Scope and Objectives

SOCOTEC UK Limited (SOCOTEC) was commissioned by Bouygues UK Limited, to prepare this Remediation Strategy (RS) document which details remedial measures to ensure the completed development at Maitland Park Villas and TRA Hall, Camden, NW3 2EH (the site) is suitable for use and to supplement existing geoenvironmental information on the site in the context of the proposed development.

The offer to carry out the work was presented in SOCOTEC offer letter QLO/EN-167813/001/DH to Bouygues dated 14 January 2021. The instruction to proceed was provided by Bouygues as Site Instruction SOC 07 of the existing Small Works Sub-contract referenced 9000325333 SOC 04 rev A.

A desk study has been prepared by others for the site and several phases of intrusive ground investigations have been carried out by SOCOTEC and others. In January 2021, SOCOTEC prepared a Contaminated Land Review (report reference R9203/003), which uses the data from the previous reports to prepare a risk assessment for the site and an updated Conceptual Site Model (CSM). A further ground investigation report prepared by CET Infrastructure has since been provided to SOCOTEC, which includes recommendations for remedial measures. Relevant data from the CET Infrastructure report has been included in the updated risk assessment summaries presented below.

The Remediation Strategy (RS) should be read in conjunction with the following reports:

- Maitland Park Villas and TRA Hall, Camden, Contaminated Land Review. SOCOTEC report reference R9203/003 Issue 2 dated January 2021
- Generic Risk Assessment of Maitland Park. CET Infrastructure report reference 351221 dated February 2017

The risk assessments identified contaminants of concern (asbestos, lead and PAH compounds) within the shallow Made Ground at levels that may pose unacceptable risks to future site users.

Therefore, an RS is required to detail the remedial works and mitigation measures to be undertaken during the redevelopment project to address the potential impact of the soil contamination encountered during the site investigations, and to reduce potential risks to human health following completion of the project.

This RS includes the procedures and responsibilities for validation of the works as conforming to the management framework outlined in the Environment Agency guidance Land Contamination Risk Management (LCRM) (EA, 2020). Geotechnical assessments of ground conditions, risks, remediation and verification requirements are outside of the scope of this report.

This RS refers to general measures and practices that should be implemented during the construction phase of the project to ensure the health and safety of workers and the environment which should be adhered to. Further detail will be provided in separate Health and Safety documents provided by the specific contractors carrying out the works.

1.2 Proposed Development

The proposed development has been approved under Planning Application 2014/5840/P) which was amended in 2017) and comprises the construction of 119 residential units (51 social units and 68 private units) and a new TRA hall. Two four to five storey blocks of flats (Aspen Court and Aspen Villas) will be constructed on the former Aspen House portion of the site, with associated hard and soft landscaping works for communal use.

Twenty nine residential units will be built along Grafton Terrace adjacent to the new TRA Hall. The units will be a mix of flats and a single house with private gardens.

Further landscaping improvement works, including realignment of paths and tree and shrub planting is proposed to the public open space to the south of the TRA Hall, which is known as Grafton Green.

The groundworks / below ground levels items within the current Bouygues contract includes:

- Reduced level excavation (minimum 600 mm but increases to circa 1000 mm due to existing levels) within the footprint of the proposed buildings
- Import a minimum of 600 mm of clean 6f2 to form plant safe working platform
- Installation of drainage
- Installation of pile caps
- Installation of ground beams
- Installation of ground floor slab

- Installation of hand landscaping where required
- Reduced level excavation within soft landscaped areas

The import and installation of the clean cover soils within the soft landscaped areas is understood to be a requirement of the follow on landscaping contractors. Details of the requirements for verification of the clean cover soils are included in this Remediation Strategy, which should be provided to the landscaping contractors to ensure subsequent compliance.

Although the red line planning site boundary extends further south into the existing park, no specific works or redevelopment is currently planned for this area and it is understood that Planning Condition 8 relating to Contaminated Land has been revised to allow partial discharge relating to the assessment and remediation of the portion of the development site within the current Bouygues construction site boundary.

The red line planning boundary is presented in Site Location Plan and proposed development plan with a blue line construction site boundary are presented in Appendix A.

1.3 Site Description and History

The site is located approximately 600 m north of Chalk Farm London Underground Station, within the London Borough of Camden; see Site Location Plan in Appendix A. The site covers an area of 1.23 ha is centred at National Grid reference TQ 279 849. The site and surrounds have a predominantly residential current and historical land use.

The Bouygues construction site comprises two separate land parcels to the east and west of Maitland Park Villas. The land parcel to the west of Maitland Park Villas comprises the former Aspen House with the gym and adjacent garages. The former buildings and associated infrastructure has recently been demolished and a shallow layer of the near surface Made Ground soils have been removed and a pile matt comprising imported aggregate has been installed across the site.

The land parcel to the east of Maitland Park Villas, comprises the former TRA Hall and adjacent garages, which were demolished several years ago and the area has lain derelict behind a construction site hoarding since. A portion of the public open space to the south of the existing hoarding around the former TRA Hall will be included within the construction site boundary, which will initially be used for the construction site compound, but will be reinstated with soft and hard landscaping following completion of the project.

2 SUMMARY OF PREVIOUS INVESTIGATIONS

2.1 Ground Conditions

The ground conditions encountered during the investigations are consistent with those shown on the published geological map. This comprised Made Ground at all locations to a maximum depth of 2 m below ground level (bgl) overlying the London Clay Formation.

No groundwater ingress was noted during the fieldwork, however, groundwater levels were recorded at between 4 and 6 m bgl within the western land parcel and at approximately 0.7 m bgl within the eastern land parcel during subsequent monitoring visits.

2.2 Laboratory Analysis Results

Details of the recent SOCOTEC and previous site investigations are presented in the SOCOTEC Contaminated Land Review (Report reference R9203/003). This included an assessment of 38 soil samples of the Made Ground within the near vicinity of the former Aspen House and TRA Hall portions of the site. The results of a further 13 soil samples, including two from 0.5 m bgl within the Grafton Green portion of the site, presented in the CET Infrastructure Generic Risk Assessment (Report reference 351221), not previously assessed by SOCOTEC, have also been included in the risk assessment summaries presented below.

2.3 Human Health Risk Assessment

Generic human health risk assessments have been undertaken by SOCOTEC and CET comparing the maximum measured soil concentrations with generic assessment criteria (GAC) derived to be protective of end users in a residential with homegrown produce scenario. This is considered to be appropriate for the proposed redevelopment, which will include private gardens. The results were also compared with GAC, assuming a public open space near residential properties end use scenario, to determine whether any remedial requirements could be limited to the private gardens.

The majority of contaminants were recorded at concentrations below the relevant GAC, however exceedances were recorded for lead, several individual Polycyclic Aromatic Hydrocarbon (PAH) compounds, including Benzo(a)pyrene, Total Petroleum Hydrocarbon (TPH) >C16-C21 and due to the presence of asbestos. Samples recording concentrations of contaminants of concern above the GAC were relatively widespread and were obtained from around both the Aspen House and TRA hall areas of the site. Sampling within the public open space portion of the site, i.e. Grafton Green has been limited to two shallow (0.5 m bgl) samples obtained by CET. However, both of these samples recorded concentrations of lead, well in excess of the GAC for public open space near residential properties.

Based on the available results, the shallow Made Ground across the site would be considered to pose a potentially unacceptable risk to future site users due to the presence and concentration of the contaminants of concern.

Therefore, remedial works will be required to break the pathway to the contaminants of concern within the soils, to ensure the completed development is safe, suitable for use and does not pose an unacceptable risk to future site users.

As the primary exposure pathway for the identified contaminants of concern is via direct contact and ingestion of dust outdoors and indoors (once tracked back into the home), the remedial works will involve excavation and removal of the soils and installation of hardstanding or a suitable clean cover system within areas of soft landscaping.

Considering the limited number of samples from the Grafton Green portion of the site, it may be possible following additional sampling, analysis (for contaminants of concern only) and risk assessment to adjust the extents and depths of clean cover, depending on the test results. See Section 3.2.2 for detail.

2.4 Controlled Waters Risk Assessment

The site is not particularly sensitive with respect to controlled waters, considering the underlying London Clay will restrict downward migration to any deeper aquifer and the nearest shallow aquifer or surface waters are a significant distance from the site. Therefore, the risk of pollution of controlled waters from the site soils is considered low and no specific remedial measures are required with respect to controlled waters.

However, the remedial measures involving the removal of shallow Made Ground will help achieve betterment of the site following redevelopment.

2.5 Ground Gas Risk Assessment

The original CSM outlined in the desk study, did not identify any potentially significant on or off-site sources of ground gas. Following four rounds of ground gas monitoring, including one round that was undertaken during a period of low and recently falling atmospheric pressure, Ramboll (Ramboll, 2014) classified the site as ground gas Characteristic Situation 1 (CS1), for which no specific ground gas protection measures are considered necessary. Ground gas risk was assessed further by CET who state that based on the monitoring results and the ground conditions encountered during their subsequent site investigation that *'there is no appreciable source of ground gas at the site and as such the associated risks are judged to be negligible'* (CET, 2017).

Basements, if proposed would be considered the most sensitive location with respect to the future development. However, it is understood that no basements are proposed and Building Control have been contacted to confirm that they agree with the CET assessment and that no gas protection measures are required. Any specific requirements from Building Control, should be incorporated into the design or construction of the foundations.

2.6 Construction Worker Risk Assessment

The high concentrations of lead, PAHs and TPH are not considered to be sufficiently elevated to pose a high risk to ground workers during short term exposure. However, the potential for exposure should be mitigated by the use of appropriate PPE (including gloves) and maintaining good site hygiene such as no drinking, eating or smoking on site (except in designated areas) and washing hands, face and lower arms when leaving the work area.

No asbestos containing materials were found during fieldwork or recorded within samples obtained from the land parcel to the east of Maitland Park Villas road. However, asbestos fibres were detected in several samples obtained from the land parcel to the west of Maitland Park Villas road, but at concentrations less than the hazardous waste threshold of 0.1% w/w.

Although, the reduced level dig and placement of imported aggregate has been completed within the land parcel to the west of Maitland Park Villas road, as a matter of good practice dust suppression should be used to minimise the generation of dust during groundworks, and therefore reduce the risk of inhalation of dust and associated contaminants by construction workers and neighbouring residents.

Given site historical use and the Made Ground soil at site, the presence of pockets or caches of asbestos (or other contaminants) cannot be ruled out. Therefore, a watching brief with mitigation plan should be maintained during groundworks for unexpected contamination, including for potential caches of asbestos.

2.7 Water Supply Pipes

The concentrations of hydrocarbons within the shallow Made Ground soils at the site are such that they may permeate buried polyethylene water supply pipes. Therefore, it is recommended that drinking water supply pipes should be placed in service trenches surrounded by certified clean material and that Al-PE-Al barrier pipe rather than polyethylene pipe is used for all drinking water supply.

2.8 Conceptual Site Model

A pre-remediation conceptual site model based on the consolidated findings from the previous ground investigations is presented in Table 1 below.

Table 1 Source Pathway Receptor Linkages

SOURCE		PATHWAY		ON-SITE RECEPTOR	OFF-SITE RECEPTOR	REMEDIAL MEASURES
Contaminants of concern (asbestos, PAHs, TPH and lead) within Made Ground	→	Dermal contact, ingestion and inhalation of particulates / fibres indoors and outdoors	→	Residents and park users (Female Child)	Off-site users (Female Child)	Removal of Made Ground / Installation of clean cover system
	→	Dermal contact, ingestion of particulates / fibres outdoors	→	Construction workers (Female Adult)	Off-site users (Female Child)	Control measures during groundworks, to include dust suppression, PPE and good site hygiene
	→	Permeation of polythene pipe material	→	Water supply pipes	N/A	Use of clean backfill in trenches and Al-PE-Al barrier pipe

The identified pollutant linkages will be managed during the development through a series of measures as described in Section 3 below.

3 PROPOSED REMEDIATION

3.1 Buildings and Hardstanding Areas

As illustrated on the proposed cover depth drawing, marked up by Bouygues; see Appendix A, with the exception of Grafton Green, the majority of the construction site will be covered with hard standing or fall within the footprint of future buildings. The presence of structures or hardstanding in these areas will break the possible exposure pathways from the identified contaminants in soils, thereby mitigating the risk to site users in these areas.

No further remediation will be required in areas to be covered by hardstanding.

Confirmation of ground gas risk assessment and that no gas protection measures are required, should be provided by Building Control.

3.2 Soft Landscaped Areas

3.2.1 Clean Cover Requirements

The areas of proposed soft landscaping can be separated into two types, based on access by future site users and residents:

- 1) Private gardens and communal areas in close proximity to the proposed new residential buildings and TRA Hall (area shaded red on marked up cover depth plan), where a minimum of 600 mm of clean cover will be required
- 2) Public open space within Grafton Green to the south of TRA Hall (area shaded blue on marked up cover depth plan), where clean cover depth could be reduced to 450 mm

Based on the available laboratory analysis results, where soft landscaping is to be installed, a clean cover of sufficient thickness should be installed in order to break any potential pollutant linkage between future site users and the underlying Made Ground soils.

Given that the Grafton Green public open space is not proposed for growing of food for human consumption, the nominal thickness of clean cover could be reduced to 450 mm, from the standard 600 mm, which would be required for all areas of soft landscaping around the residential properties and TRA Hall.

The imported clean cover soils should be underlain by a geotextile marker layer to clearly delineate the underlying potentially contaminated soils with the clean imported soils. The geotextile marker layer should be water permeable, rot-proof, chemically resistant and have high tensile strength. The geotextile should be applied across the total surface of the exposed soils to be remediated and parallel layers should be suitably secured together or overlapped by at least 20 cm.

The clean cover system should incorporate a minimum of 150 mm of topsoil at the upper limit of the system, conforming to the requirements of the acceptance criteria detailed in Table 2 below, and the British Standard 3882: 2015 Specification for Topsoil (multipurpose grade). This will ensure that conditions within the cover system are suitable for healthy plant growth.

3.2.2 Further Assessment of In-Situ Soils

The Made Ground has generally been recorded to depths of greater than the proposed reduced level dig required to achieve the minimum clean cover depth. However, should natural soils be encountered during the reduced level dig, then the depth of clean cover may be reduced, provided the Made Ground soils have been removed to full depth. Additional sampling and analysis (for the site contaminants of concern only) of the underlying natural soil strata would be required to confirm that the underlying soils meet the GAC for the proposed use of that portion of the site. A minimum of three samples would be required, with one sample not representing more than 25 m².

Considering the limited testing of shallow soils within the Grafton Green portion of the site, further shallow soil sampling, analysis (for the site contaminants of concern only) and risk assessment may be carried to determine whether portions of the in-situ soils are suitable to remain without the requirement for a clean cover. The sampling would need to be carried out on minimum 5 by 5 m grid density.

Subject to the results of any further testing, the design of the clean cover system, i.e. depth, extent and requirement for a marker layer may be designed by an independent environmental consultant, such as SOCOTEC. Any changes to the requirements of the clean cover detailed in Section 3.2.1 would require prior approval by the Local Contaminated Land Officer.

3.3 Reuse of Site Won Soils and Recycled Aggregate

Significant earthworks are not proposed as part of the site redevelopment. No site won soils suitable for reuse within the clean cover layer have been identified and it is understood that all soils and demolition rubble from existing structures or hardstanding excavated as part of the reduced level dig will be removed from site as waste.

However, should excavated soils or site won crushed demolition rubble be considered for reuse on site, below buildings, hardstanding or clean cover layers, a Materials Management Plan (MMP), detailing the movement and management of excavated soils or site won recycled aggregate found to be suitable for direct reuse use should be prepared in accordance with CL:AIRE Definition of Waste, Development Industry Code of Practice (CL:AIRE 2011). The MMP will be reviewed and the declaration signed by a qualified person independent from the risk assessment process and submitted to the regulatory body (CL:AIRE on behalf of the EA).

3.4 Waste Characterisation and Classification

All excavated Made Ground soils should be disposed of off-site to suitably engineered and permitted waste management facilities.

It is a statutory requirement to classify waste designated for disposal as inert, hazardous or non-hazardous prior to off-site disposal in accordance with the EA's Technical Guidance Note WM3 'Guidance on the Classification and Assessment of Waste' (EA, 2015).

Additional sampling and analysis of the contaminated soils may be required depending on the volume of waste generated to fully characterise the waste in accordance with EA guidance. Depending on where the soils will be sent, Waste Acceptance Criteria (WAC) testing may also be required to confirm the soils meet the requirements for a hazardous landfill.

Upon removal from site, soils should be excavated directly into lined and covered trucks before being transported under the appropriate waste management protocols to a licenced waste disposal facility. Each load should be accompanied by hazardous waste consignment or non-hazardous waste transfer notes.

Should any soils be identified as hazardous, the Hazardous Waste Regulations require a register to be maintained of any movement of hazardous waste between premises. Full details of the record keeping requirements are presented in EA Guidance HWR05 Version 6 dated June 2011, but can be summarised as follows:

- A consignment note must be produced when hazardous waste leaves the site and a copy must be retained
- The waste consignee should send a return each month detailing what has happened to the waste
- Records should also be kept of any rejected loads and if multiple carriers are involved
- The register must be maintained for a period of at least 3 years

Similar record keeping should be maintained for non-hazardous waste, for inclusion in the Verification Report.

3.5 Specification of Water Supply Pipes

Water supply pipes suitable for Brownfield sites, i.e. barrier pipe, should be used for the provision of water supply to the site. The specification of water supply pipe should be reviewed and approved by the Local Water Authority. Evidence should be presented in the Verification Report.

4 REMEDIATION PROCESS

4.1 Watching Brief

A full time watching brief for unexpected contamination should be carried out by suitably qualified and experienced personnel throughout all soil excavation and handling works. Should any unexpected significantly contaminated soil, groundwater or visible fragments or caches of asbestos be identified, the area should be made safe, secured and an independent environmental consultant, such as SOCOTEC contacted for further assessment.

The following materials are automatically considered unexpected and would require, inspection by and environmental consultant and subsequent, segregation for classification and disposal as a separate waste stream, delineation and verification:

- Visible fragments of asbestos
- Hydrocarbon impacted soils, evident by odours or black staining
- Other hazardous or deleterious materials, such as drums, or materials with hazardous properties

In addition to the above, any material encountered which has an unusual colour, texture or odour is to be assessed further by a suitably environmental consultant.

The individual carrying out the watching brief will maintain a daily site diary which, in addition to general observations, will take regular photographs for inclusion in the Verification Report.

4.2 Reduced Level Excavation and Placement of Geotextile Marker Layer

The Made Ground soils within the areas of future soft landscaping, should be excavated to sufficient depth to allow for the installation of the full depth of clean cover. The geotextile marker layer should be installed as per Section 3.2.1 at the base of the excavation and photographs taken to record the presence of the marker layer at sufficient depth for subsequent inclusion within the Verification Report.

Photographic evidence of the installation of the geotextile marker layer should be provided to an independent environmental consultant, such as SOCOTEC for review and approval prior to backfilling with clean cover soils.

4.3 Imported Clean Cover Material

Topsoil and subsoil are to be imported to the site for use as clean cover within all areas of soft landscaping by the Landscape Contractors. It is understood that Prior to being imported to site, the materials will be approved by an environmental consultant through the review of soil source information and chemical contaminant testing results.

4.3.1 Physical Requirements

Topsoil will conform to the requirements of BS3882: 2015 (Specification for topsoil and requirements for use). Subsoil should comprise chalk, clay or sand and should have a maximum of 60% of fragments in excess of 2 mm, a maximum of 30% in excess of 20 mm and a maximum of 10% in excess of 50 mm, with nothing in excess of 75 mm. This is to be confirmed by visual inspection of the material by the Bouygues and Landscape Contractor site managers, and if necessary by particle size analysis.

Topsoil and subsoil will be free of fragments of glass, brick, concrete, wire or other potentially hazardous foreign material which could cause injury. In addition, all materials must be free from invasive plant species (e.g. Japanese Knotweed and Giant Hogweed) and bulk vegetative growth, in order to ensure negligible risk of subsequent weed problems.

4.3.2 Chemical Testing Requirements

Chemical testing of the imported soils will be required prior to the material arriving at site. This will be undertaken at a rate of one test per 250 m³ for material from a recognised source, for a suite of determinands commonly associated with that source. If the source of the material is not recognised, chemical testing will be undertaken at a rate of one test per 100 m³.

A minimum of four chemical suites will be undertaken on any individual source material. The sampling is to be undertaken by a suitably qualified environmental consultant and depending on the source or variability of imported material, the independent environmental consultant reviewing the source information, may request additional testing to be undertaken. Samples will be tested by a UKAS and MCERTS accredited laboratory and certificates provided to an independent environmental consultant for review prior to the material being imported.

Imported soils should be assessed against the criteria detailed in Table 2 below.

Table 2 Acceptance Criteria for Imported Clean Cover Soils

Determinand		Soil Acceptance Criteria (mg/kg)	Source of GAC
Human Health Metals	Arsenic	37	S4UL ¹
	Boron	290	S4UL ¹
	Cadmium	11	S4UL ¹
	Chromium III	910	S4UL ¹
	Chromium VI	6	S4UL ¹
	Lead	200	S4UL ¹
	Mercury (inorganic)	40	S4UL ¹
	Selenium	250	S4UL ¹
Phytotoxic Metals ²	Copper	100	BS3882: 2015 ²
	Nickel	60	BS3882: 2015 ²
	Zinc	200	BS3882: 2015 ²
Polycyclic Aromatic Hydrocarbons	Acenaphthene	210	S4UL ¹
	Acenaphthylene	170	S4UL ¹
	Anthracene	2400	S4UL ¹
	Benzo(a)anthracene	7.2	S4UL ¹
	Benzo(a)pyrene	2.2	S4UL ¹
	Benzo(b)fluoranthene	2.6	S4UL ¹
	Benzo(g,h,i)perylene	320	S4UL ¹
	Benzo(k)fluoranthene	77	S4UL ¹
	Chrysene	15	S4UL ¹
	Dibenzo(a,h)anthracene	0.24	S4UL ¹
	Fluoranthene	280	S4UL ¹
	Fluorene	170	S4UL ¹

Determinand		Soil Acceptance Criteria (mg/kg)	Source of GAC
	Indeno(1,2,3,c,d)pyrene	27	S4UL ¹
	Naphthalene	2.3	S4UL ¹
	Phenanthrene	95	S4UL ¹
	Pyrene	620	S4UL ¹
Petroleum Hydrocarbons and BTEX	TPH – Aliph >C5-06	42	S4UL ¹
	TPH – Aliph >C6-C8	100	S4UL ¹
	TPH – Aliph >C8-C10	27	S4UL ¹
	TPH – Aliph >C10-C12	130	S4UL ¹
	TPH – Aliph >C12-C16	500	Inert waste WAC threshold ³
	TPH – Aliph >C16-C35	500	Inert waste WAC threshold ³
	TPH – Aliph >C35-C44	500	Inert waste WAC threshold ³
	TPH – Arom >EC5-EC7	70	S4UL ¹
	TPH – Arom >EC7-EC8	130	S4UL ¹
	TPH – Arom >EC8-EC10	34	S4UL ¹
	TPH – Arom >EC10-EC12	74	S4UL ¹
	TPH – Arom >EC12-EC16	140	S4UL ¹
	TPH – Arom >EC16-EC21	260	S4UL ¹
	TPH – Arom >EC21-EC35	500	Inert waste WAC threshold ³
	TPH – Arom >EC35-EC44	500	Inert waste WAC threshold ³
	Benzene	0.087	S4UL ¹
	Toluene	130	S4UL ¹
	Ethylbenzene	47	S4UL ¹
	Xylenes	56	S4UL ¹
Other Compounds	Asbestos	No detectable asbestos and no obvious visible ACM present	SOCOTEC GAC
	Cyanide	22	SOCOTEC GAC (acute)
	Phenol (total)	280	S4UL ¹
	Polychlorinated Biphenyls (PCBs) (non-dioxin like 7 congeners)	0.35	SOCOTEC GAC

¹ S4UL LQM Suitable for Use Levels for residential with consumption of homegrown produce end use (Copyright Land Quality Management Limited, reproduced with permission; Publication Number S4UL3144. All rights reserved)

² Copper, nickel and zinc values corresponding to soil pH <6, for alternate pH values refer to BS 3882:2015

³ Considered to be conservative and protective of the groundwater beneath the site

Details of imported soil sampling, analysis and assessment will be included in a Verification Report at the end of the works.

4.4 Validation and Verification of the Clean Cover System

Validation and verification of the construction of the clean cover system will be undertaken by an independent environmental consultant, such as SOCOTEC by a series of post placement validation / verification hand dug pits down through the clean cover to the geotextile across all areas of soft landscaping / gardens.

This will be undertaken by excavating a minimum of one validation hand pit in each residential property private garden and at an approximate grid of one every 100 m² across all communal and public open space soft landscaping remediated areas, and measuring, recording and photographing the depth of the capping layer. In addition pre and post topographic surveys can be used to also help validate that an adequate depth of topsoil and subsoil has been placed.

Where the full depth of the clean cover system has not been achieved, Bouygues will be informed and additional soil will be placed. Details of the validation will be included in a Verification Report.

4.5 General Considerations

All groundworks will be carried out by an experienced contractor with the required licences, permits and consents, health and safety measures, working plans / deployment forms and method statements all agreed and in place prior to commencement of the relevant aspects of work.

All works will be monitored by appropriately qualified personnel in line with the requirements of this remediation strategy and all the works will be carefully documented to include a full chain of custody and disposal record for all materials disposed of off-site.

Construction ground workers will wear appropriate PPE and observe strict hygiene rules to minimise the risk from dermal contact, ingestion and inhalation of vapours/dust. Measures shall be adopted to minimise dust, vapour and noise generation.

The contractor will be aware of the precise location of any underground services and put procedures in place to ensure the protection of any services.

5 VERIFICATION PROCESS

5.1 Verification Plan

Records of all remediation activities undertaken will be maintained and kept up to date during the development for inclusion in the Verification Report. Records will include the following:

- Quantities of site won soils removed from site as waste including Duty of Care records (Waste Transfer of Hazardous Waste Consignment Notes), waste carrier licences and disposal site permits
- Quantities of imported soils, including source laboratory testing results and origin details to prove suitability
- Details of any significant contamination / hot spots encountered and removal and delineation
- Geotechnical and chemical test results for reused or imported materials, including any verification test results of placed materials, including sample location plans
- Details of any verification 'failures' and the actions taken and details of any changes to the remediation methodology that may occur as the works progress
- Watching brief personnel field notes / site diary and photographic evidence of any contamination encountered and remedial measures, such as installation of geotextile membranes
- Any additional consents, licenses, permits or authorisations obtained, such as discharge of water to sewer and evidence of compliance
- 'As built' drawings
- Topographic survey plans showing final levels and depth of clean cover layer
- Specification of water supply pipe material

5.2 Verification Report

A Verification Report will be produced for the project by the Principal Contractor (or an environmental consultant on their behalf) who will be responsible for implementing the Verification Plan and obtaining the information required for completion of the Verification Report, providing documentary evidence that the remediation has been achieved in accordance with this RS. If any changes are made to the Remediation Strategy during the construction phase, they should be detailed in the Verification Report with documentary evidence of the justifications and permissions as appropriate.

The Verification Report will contain information obtained during the earthworks project as presented in the Verification Plan and will include a final conceptual site model for the site including confirmation that identified contaminant linkages have been remediated. The Verification Report will be provided to the Local Planning Authority in support of the discharge of relevant Planning Conditions. The Verification Report will be produced on completion of the construction project.

6 REGULATORY APPROVAL

A copy of this report should be forwarded to the Local Planning Authority for review and approval prior to commencing on site.

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APPENDIX A

FIGURES AND DRAWINGS

Planning Site Boundary Plan

Cullinan Studio Drawing MPI_P_02 PL02

Proposed Clean Cover Depths

Cullinan Studio Drawing MPI_ZZ_00-DR-A1020



- NOTES:
- OTHER LAND IN APPLICANT'S OWNERSHIP
 - SITE BOUNDARY
 - TO BE DEMOLISHED

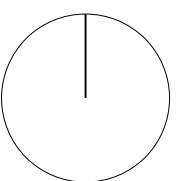
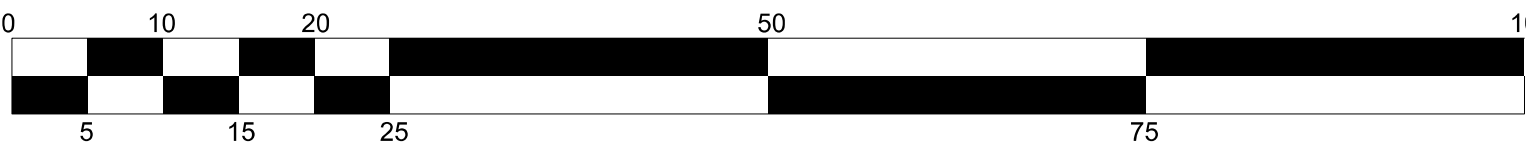
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PROJECT TITLE
MAITLAND PARK

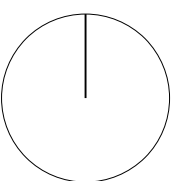
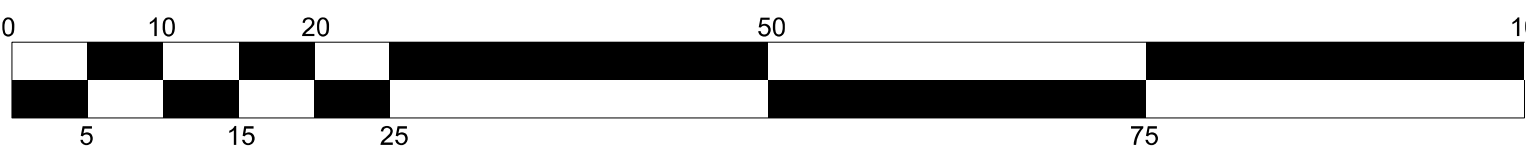
DRAWING TITLE
EXISTING SITE GROUND FLOOR
BLOCK PLAN

DATE 19/08/2014	SCALE 1:1000 @ A3 1:500 @ A1
STATUS PLANNING	DRAWN KR
	CHECKED AA

DRAWING NUMBER MPI_P_02	REVISION PL02
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NOTES:

- Note: for landscape proposals and trees to be removed, refer to Landscape Architect's drawings:
- Trees to be removed/retained - Refer to Arboriculturist Report and Drawing
 - Landscape GA – TM122L03

Note: distances shown are for information only

REV	DATE	DETAIL	DRN	CHK
T1	31.03.17	STAGE 4 TENDER	APo	AA
T2	28.04.17	Updated	HD	AA
T3	09.10.17	Tender Addendum - AV entrance updated, dry risers added	HD	AA
T4	17.10.19	Stage 3 Updated	HD	AA
T5	29.11.19	Stage 3 Issue	HD	AA

PROJECT TITLE

MAITLAND PARK

DRAWING TITLE

PROPOSED SITE GROUND FLOOR
BLOCK PLAN

DATE 20/09/2019	SCALE 1:1000 @ A3 1:500 @ A1	
STATUS STAGE 3 2019	DRAWN HD	CHECKED AAb

DRAWING NUMBER
MPI- ZZ-00-DR-A-1020

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