



# **MAITLAND PARK VILLAS AND TRA HALL, CAMDEN**

## **CONTAMINATED LAND REVIEW**

Carried out for:

**Bouygues UK Limited**  
Becket House  
1 Lambeth Palace Road  
London  
SE1 7EU

**January 2021**

**Report No R9203/003 Issue 2**

## Report No R9203/003

January 2021

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Whilst every effort has been made to ensure the accuracy of the data supplied and any analysis interpretation derived from it, the possibility exists of variations in the ground and groundwater conditions around and between the exploratory positions. No liability can be accepted for any such variations in these conditions. Furthermore, any recommendations are specific to the development as detailed in this Report and no liability will be accepted should they be used for the design of alternative schemes without prior consultant with SOCOTEC UK Limited.

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## SUMMARY

SOCOTEC has undertaken a review and human health risk assessment on the available site investigation data and update the Conceptual Site Model at the development site known as Maitland Park Villas and TRA hall, Camden. The review is required to determine any future requirements, if needed to meet the outstanding Planning Condition related to contaminated land and to ensure the completed development is suitable for use.

Contaminants of concern (asbestos, lead PAH compounds and hydrocarbons) were identified within the shallow Made Ground at levels that may pose unacceptable risks to the 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 (potentially reduced to 450 mm in some areas on agreement with the Regulator) of validated clean imported topsoil and subsoil over a geotextile marker layer within all areas of soft landscaping within the red line planning site boundary.

A large portion of the site comprises public open space with a park and limited soil sampling and analysis has been carried out in this portion of the site. Therefore, a site investigation (the design of which should consider the proposed groundworks and be agreed in advance with the Regulator) is proposed to allow for the assessment of the soils within the wider park area, to potentially reduce the requirement for the clean cover system within the public park portion of the site.

The site setting is not sensitive with respect to controlled waters and based on the residential use of the site, the risk to controlled waters is low.

The status of the review and approval of any ground gas protection measures incorporated into the buildings by Building Control should be established. Depending on the findings, further ground gas risk assessment and investigation may be required. However, historical site investigations have indicated that the ground gas risks are likely to be very low.

A Remediation Strategy and Verification Plan should be prepared to include the detail design, location, extent and validation requirements of the clean cover system.

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.

## 1 INTRODUCTION

SOCOTEC UK Limited (SOCOTEC) was commissioned by Bouygues UK Limited, to carry out a desk based review of the various desk study, intrusive ground investigation and risk assessments and prepare an updated human health risk assessment and Conceptual Site Model (CSM) for the site known as Maitland Park Villas and TRA Hall, Camden, NW3 2EH (the site).

The human health risk assessment is to be updated by screening the soil analysis results obtained during the historical and recent SOCOTEC site investigations against current generic assessment criteria. The updated risk assessment and CSM is to be provided to the Local Planning Authority (LPA) to allow for the discharge of the Planning Condition related to Contaminated Land.

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.

As Principal Contractor for the redevelopment of the site into 119 residential units (51 social units and 68 private units) and the replacement of the Tenants and Residents Association (TRA) hall; Bouygues are required to discharge the planning condition relating to Contaminated Land.

Two relevant reports, prepared by others have been provided to SOCOTEC for review:

1. Maitland Park, Geotechnical and Environmental Desk Study, Rambol report reference 61031879-MP-GE/EV-RPT-001, 31st January 2014 (the desk study)
2. Camden Sites – Maitland, Interpretation of Ground Investigation Data, Rambol report reference 61031879/KA/jee/01, 15th May 2014 (the SI report)

It is understood that a further phase of site investigation was proposed for the site by CET Infrastructure Limited in January 2017, the scope of which was subsequently agreed in writing by the Local Contaminated Land Officer (see Appendix B). A factual ground investigation report by CET Infrastructure Limited (ref 351221) dated February 2017 is available, however, the report does not include any contaminated land testing or gas monitoring as outlined in the approved scope.

Following completion of Issue 1 of this report, the following CET reports have been provided to SOCOTEC:

1. Generic Risk Assessment of Maitland Park, CET report reference 351221, February 2017
2. Maitland Park Remediation Plan, CET report reference 351221/RP, 3 March 2017

Although the data has not been included in the detailed SOCOTEC data assessment, a review of the reports, indicates that the CET findings and recommendations are consistent with the conclusions made by SOCOTEC in Issue 1 of this report, i.e. contaminants of concern (lead and PAH compounds) are present within the shallow soils at levels that may pose unacceptable risk to future site users and a 600 mm clean cover layer should be installed within all areas of proposed soft landscaping at the site.

In January and September 2020, SOCOTEC carried out intrusive ground investigations at the site and recovered shallow soil samples representative of the soils to be removed from site as waste, for subsequent laboratory analysis and indicative waste classification. The results and waste classification have been presented in separate letter reports referenced LO/R9203/001/MH, dated 22 January 2020 and LO/R9203/002/CH, dated 7 September 2020.

The assessment of the site and has been carried out in accordance with the requirements of the British Standards BS10175: 2011+A2: 2017 Investigation of Contaminated Sites – Code of Practice and all normative references and the Environment Agency guidance Land Contamination Risk Management (LCRM) (EA, 2020).

## 2 THE SITE

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 comprises land to the east and west of Maitland Park Villas road and can be separated into three general areas:

1. Aspen House with the gym and the adjacent garages to the west of Maitland Park Villas
2. The former TRA hall and adjacent garages to the south of Grafton Terrace, all of which were demolished in 2017
3. The portion of public open space to the east of Maitland Park Villas road and south west of the former TRA

The red line planning boundary is presented in Site Location Plan in Appendix A.

## 2.1 Historical Land Use

The site and surrounds have a predominantly residential current and historical land use. With the exception of potential asbestos within on site buildings and two electrical sub-stations immediately and 50 m south of the site, no significant current or historical sources of contamination were identified during the desk study review of the site.

## 2.2 Proposed Development

As outlined in Planning Application 2014/5840/P, which was amended in 2017, the proposed development 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 south of the TRA Hall.

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.

The proposed site layout is presented in the Masterplan; see Appendix A.

## 3 PLANNING CONDITION REQUIREMENTS

The Planning Application (2014/5840/P) for the development was approved on 31 March 2015, with Condition 8 relating to Contaminated Land, which states:

*'At least 28 days before development commences:*

- (a) a written programme of ground investigation for the presence of soil and groundwater contamination and landfill gas shall be submitted to and approved by the local planning authority in writing; and*

*(b) following the approval detailed in paragraph (a), an investigation shall be carried out in accordance with the approved programme and the results and a written scheme of remediation measures [if necessary] shall be submitted to and approved by the local planning authority in writing.*

*The remediation measures shall be implemented strictly in accordance with the approved scheme and a written report detailing the remediation shall be submitted to and approved by the local planning authority in writing prior to occupation.*

*Reason: To protect future occupiers of the development from the possible presence of ground contamination arising in connection with the previous industrial/storage use of the site in accordance with policy CS5 of the London Borough of Camden Local Development Framework Core Strategy and policy DP26 of the London Borough of Camden Local Development Framework Development Policies.'*

Part A of Condition 8 has been discharged, following a review of the CET Infrastructure Limited proposed scope for a site investigation in January 2017. The email correspondence with the Local Contaminated Land Officer and condition approval letter are presented in Appendix B.

However, it does not appear that the CET site investigation report, including the risk assessment and the CET Verification Plan, outlining a minimum of 600 mm of clean cover to be installed within all areas of soft landscaping have been submitted to the Local Planning Authority. Therefore, this report and the CET reports should be provided to the Local Planning Authority in support of the discharge of Part B of Condition 8.

#### **4 GEOLOGY, HYDROLOGY AND HYDROGEOLOGY**

The published geological map covering the site, BGS Map Sheet 256 (Solid and Drift) North London, shows the site to be directly underlain by Solid Geology of the London Clay Formation. No Superficial Deposits are present on site and the London Clay Formation is considered unproductive strata (non-aquifer).

Made Ground associated with the historical development of the site has been encountered to a maximum depth of 2 m below ground level (bgl) during the previous ground investigations. London Clay was found to underlie the Made Ground during the ground investigations.

The nearest surface water feature is considered to be the River Fleet which is culverted and flows underground approximately 150 m north east of the site. The River Fleet is a tributary of the River Thames and is understood to be part of the London sewer system.

The site setting is not considered to be sensitive with respect to controlled waters and risks considering the current and historical use of the site is primarily residential, the risks to controlled waters are low and controlled waters have not been assessed further.

## 5 SUMMARY OF PREVIOUS GROUND INVESTIGATIONS

Two ground investigation reports prepared by others have been made available to SOCOTEC for review, the May 2014 Ramboll ground investigation (ref 61031879/KA/jee/01). Following submission of Issue 1 of this report, the CET site investigation and generic risk assessment report was provided to SOCOTEC. Given time restraints, the full data in the CET report has not been assessed, however, a review of the findings indicates that the soil analysis results and recommendations for a minimum of 600 mm of clean cover is consistent with the SOCOTEC findings.

### 5.1 Ramboll Site Investigation

The Ramboll May 2014 ground investigation comprised the sinking of three cable percussive boreholes (BH1, BH3 and BH6) to a maximum depth of 35 m bgl. Boreholes BH1 and BH1 were located within the Aspen House portion of the site and BH6 was located in the north east corner of the site adjacent to the TRA hall. Boreholes BH1 and BH6 were installed with gas and groundwater monitoring wells.

The Ramboll borehole location plan is presented in Appendix A.

Four soil and two groundwater samples were analysed for a range of potential contaminants and ground gas monitoring was undertaken on four occasions during March and April 2014.

The soil analysis results are reassessed against current generic assessment criteria in Section 6. The gas monitoring results are assessed further in Section 7.

### 5.2 SOCOTEC Site Investigation

SOCOTEC carried out two rounds of site investigation in 2020, comprising the sinking of 15 trial pits and 4 window sample boreholes. Thirty four soil samples were obtained from the shallow Made Ground to represent the soils to be removed from site and to allow an indicative waste classification exercise to be carried out on the soils. Sampling focused on the near surface soils within the near vicinity of Aspen House and the TRA Hall.

Although the analysis results are from the Made Ground which will have been removed from site as waste, the results would be considered representative of the contamination status of the general Made Ground soils within the site and the results have been reassessed against generic assessment criteria for risks to human health / future site users in Section 6.

The SOCOTEC exploratory hole location plans are presented in Appendix A.

### 5.3 Laboratory Analysis Results

A total of 38 soil samples representing the Made Ground within the near vicinity of the former Aspen House and TRA Hall have been analysed for a range of contaminants during the Ramboll and SOCOTEC site investigations as detailed in Table 1 below.

The sampling density / site coverage would be considered adequate with respect to the requirements of the BS10175 Code of Practice for the Investigation of Potentially Contaminated Sites, with the portion of the site to the west of Maitland Park Villas road, i.e. around Aspen House and with close proximity of TRA Hall and the proposed Grafton Terrace flats. However, no soil analysis results are available for the public open space portion of the site, including the Glade area and MUGA site.

**Table 1** Summary of Soil Laboratory Testing

| Determinand                                                                                                  | No. of Tests |
|--------------------------------------------------------------------------------------------------------------|--------------|
| Metals and semi-metals (boron, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc) | 38           |
| Vanadium                                                                                                     | 4            |
| Hexavalent Chromium                                                                                          | 38           |
| Polycyclic Aromatic Hydrocarbons (16 US EPA PAH compounds)                                                   | 36           |
| Gasoline Range Organics (GRO C06-C08)                                                                        | 34           |
| Total Petroleum Hydrocarbons (TPH with carbon banding)                                                       | 36           |
| Benzene, Toluene, Ethylbenzene and Xylene (BTEX compounds)                                                   | 36           |
| Cyanide (free)                                                                                               | 36           |
| Phenol (total / index)                                                                                       | 36           |
| Polychlorinated Biphenyls (PCBs) (non-dioxin like 7 congeners)                                               | 32           |
| Volatile Organic Compounds (VOCs target list)                                                                | 12           |
| Asbestos Screen (Stage 1)                                                                                    | 36           |
| Asbestos Quantification (Stages 2 and 3)                                                                     | 8            |

## 6 HUMAN HEALTH RISK ASSESSMENT

### 6.1 Technical Approach

A description of the basis for the Human Health risk assessment is included in Appendix C.

Following redevelopment, the site will be a combination of residential with adjacent communal gardens, public open space and limited private residential gardens. The results have initially been compared with the most sensitive end use in mind, i.e. 'residential with the consumption of home grown produce'.

### 6.2 Human Health Risk Assessment Screening

All 38 soil samples collected during the SOCOTEC and Ramboll ground investigations have been screened against the GAC (at a 2.5 % SOM) for a residential with homegrown produce end use scenario as described above. The 2.5% SOM criterion was chosen, as the average loss on ignition recorded on the samples was 4.5%.

The full GAC screening table is presented in Appendix D. 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. The maximum recorded concentrations of the contaminants of concern were also elevated above the GAC for a less sensitive generic end use, such as residential without homegrown produce, i.e. communal garden areas and public open space, indicating that these contaminants of concern may pose an unacceptable risk to future users of the site.

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.

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). Therefore, the exposure pathway could be broken relatively easily following the installation of permanent hardstanding or an engineered clean cover system, comprising a geotextile marker layer and a minimum of 600 mm of clean verified imported topsoil and subsoil within all areas of soft landscaping within the red line planning site boundary. The depth of clean cover could potentially be reduced to a minimum of 450 mm within areas of communal access and the wider public open space.

As no soil analysis results are available for the wider park / public open space, which still lies within the red line planning site boundary, shallow soil sampling, analysis and risk assessment could be undertaken within this portion of the site to reassess the requirement for the clean cover layer of imported topsoil / soil.

It is understood that landscaping improvement works are also proposed for part of the park and some imported soils are already being proposed. The site investigation and sampling exercise, which may reduce the requirement for a clean cover layer to be installed within all areas of soft landscaping within the red line planning site boundary, should be designed with consideration of the detailed plans for groundworks the remainder of the park and public open space.

## 7 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.

Furthermore, Ramboll carried out four rounds of ground gas monitoring of BH1 located to the west of Aspen House and BH6 located to the east of the TRA Hall. The first monitoring round was undertaken during a period of low and recently falling atmospheric pressure.

The monitoring wells were designed to target both the Made Ground and underlying London Clay strata with a screen from 1.5 and 10 m bgl. However, groundwater levels within BH1 were elevated above the top of the gas screen during all four visits and less reliance has been placed on the results from BH1.

The maximum flow rate recorded during the monitoring visits was 0.1 l/hr. The maximum concentrations of methane and carbon dioxide recorded were 0.1% and 1.7% respectively. Ramboll conclude that the ground gas Characteristic Situation for the site is CS1 based on the data, i.e. very low risk and no specific ground gas protection measures would be required.

However, considering the limited dataset and site coverage, Ramboll recommended additional ground gas monitoring to confirm the risk to be very low.

The new building foundations have been completed at the site, however, SOCOTEC are not aware of any specific gas protection measures being incorporated into the design. Building Control often have a role in reviewed and approving the design and construction of any ground gas protection measures and will have knowledge of the general ground gas risks in the area. Therefore, the current status of review and approval with Building Control should be established, before any further assessments are carried out with regard to ground gas risks or gas protection measures.

## 8 WATER SUPPLY PIPEWORK

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.

## 9 UPDATED CONCEPTUAL SITE MODEL

The potential sources, pathways and receptors, have been assessed in respect of whether they constitute potentially significant pollutant linkages (Table 2). This has been updated to incorporate the findings of the Ramboll and SOCOTEC site investigations.

Table 2 Updated Conceptual Site Model

| SOURCE                                                                    |   | PATHWAY                                                                       |   | ON-SITE RECEPTOR                        | OFF-SITE RECEPTOR             | SIGNIFICANCE                                                                           |
|---------------------------------------------------------------------------|---|-------------------------------------------------------------------------------|---|-----------------------------------------|-------------------------------|----------------------------------------------------------------------------------------|
| Contaminants of concern (asbestos, PAHs, TPH and lead) within Made Ground | → | Dermal contact, ingestion and inhalation of particulates indoors and outdoors | → | Residents and park users (Female Child) | Off-site users (Female Child) | High, reduced to Low following installation of clean cover system                      |
|                                                                           | → | Permeation of polythene pipe material                                         | → | Water supply pipes                      | N/A                           | Use of clean backfill in trenches and Al-PE-Al barrier pipe required                   |
| Ground gas generated from Made Ground                                     | → | Migration and accumulation in building / confined spaces                      | → | Buildings proposed for occupants        | Neighbouring houses           | Likely to be low, however, confirmation of approval by Building Control still required |

## 10 RECOMMENDATIONS

This report should be provided to the Local Planning Authority; specifically the Local Contaminated Land Officer to provide an update on the current status of the site regarding the contaminated land issues.

The current status of the design and approval or not by Building Control of the ground gas protection measures within the buildings should be clarified. Once the status of the ground gas protection measures is known, the potential risks from ground gas and requirements for any additional site investigation or assessment can be determined and agreed with the Local Contaminated Land Officer.

Considering the widespread presence of asbestos and several chemical contaminants of concern within the Made Ground soils to the west of Maitland Park Villas road and the north east corner in the vicinity of the TRA hall, a clean cover system comprising 450 to 600 mm (to be agreed with the Local Contaminated Land Officer) of verified clean imported topsoil / subsoil, overlying a geotextile marker layer should be installed within all areas of soft landscaping within the red line planning site boundary.

However, shallow soil sampling within the wider public open space portion of the site has is limited (two CET soil samples have recorded elevated concentrations of lead) and therefore, a site investigation, designed with consideration of the proposed groundworks and agreed in advance by the Local Contaminated Land Officer should be carried out. Subject to the findings and assessment, the standard requirement of a 450 to 600 mm clean cover may be able to be reduced or removed within some parts of the soft landscaping within the red line planning site boundary.

Bouygues are planning further soil sampling within the public open space shortly after they take access of the site and a Remediation Strategy and Verification Plan should be prepared to progress the CET Verification Plan to include the detail design, location, extent and validation requirements of the clean cover system. The Verification Report would require approval by the Local Contaminated Land Officer.

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.

## REFERENCES

- BGS England and Wales Sheet 256 : 2006 : North London. 1:50,000 geological map (solid and drift). British Geological Survey.
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2015 : The LQM/CIEH S4ULs for Human Health Risk Assessment, Land Quality Press,  
Nottingham. 2015. Publication Number S4UL3144.

## APPENDIX A

### FIGURES AND DRAWINGS

|                                                |                                       |
|------------------------------------------------|---------------------------------------|
| Planning Site Boundary Plan                    | Cullinan Studio Drawing MPI_P_02 PL02 |
| Proposed Site Masterplan                       | Turkington Martin Drawing 122-L03 I   |
| Ramboll Borehole Plan                          | Harrison Drawing GL18005-DR002        |
| SOCOTEC Aspen House Exploratory Hole Locations | Figure 1                              |
| SOCOTEC TRA Hall Exploratory Hole Locations    | Figure 1a                             |
| SOCOTEC Maitland Park Villas Sample Plan       | Figure 1                              |



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

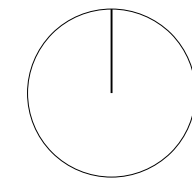
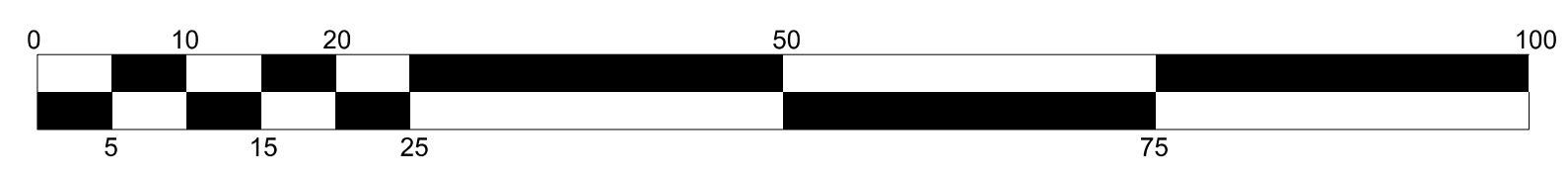
| REV | DATE | DETAIL | DRN | CHK |
|-----|------|--------|-----|-----|
|     |      |        |     |     |

PROJECT TITLE  
MAITLAND PARK

DRAWING TITLE  
EXISTING SITE GROUND FLOOR  
BLOCK PLAN

|                    |                                    |
|--------------------|------------------------------------|
| DATE<br>19/08/2014 | SCALE<br>1:1000 @ A3<br>1:500 @ A1 |
| STATUS<br>PLANNING | DRAWN<br>KR                        |
|                    | CHECKED<br>AA                      |

|                            |                  |
|----------------------------|------------------|
| DRAWING NUMBER<br>MPI_P_02 | REVISION<br>PL02 |
|----------------------------|------------------|



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\* please refer to the Planning Statement prepared by Quod for further details

|          |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   |    |
|----------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|
| 20100024 | NV | Bin store removed to Grafton Terrace. Bin store removed to Aspen Villas. Maintenance area added to Aspen Villas. Bin store arrangement moved to Grafton Terrace. Substation and generator shown to Grafton Mews. Bin store arrangement moved to Grafton Terrace. Maintenance steps added to Aspen Villas. Cycle store areas and garden arrangements adjusted to suit revised ground floor layout. Existing planting adjusted to suit revised layout for building entrance. Bin store enlarged to accommodate 2 x 600L food waste bin. Maintenance steps added to Aspen Villas. Walls, settings, trees, etc. shown. Central Courtyard to Aspen Court amended to include seating and groupings of trees. Cycle store areas and garden arrangements adjusted to suit revised ground floor layout. Existing planting adjusted to suit revised layout for building entrance. Bin store enlarged to accommodate 2 x 600L food waste bin. Amendments to area south of Aspen Villas. Access to the retained water pump room / pump shed amended to retain existing access. Footprint realigned to existing alignment east of Whitebeam House. | I | TS |
| 20100024 | NV | Bin store removed to Aspen Villas. Maintenance area added to Aspen Villas. Bin store arrangement moved to Grafton Terrace. Substation and generator shown to Grafton Mews. Bin store arrangement moved to Grafton Terrace. Maintenance steps added to Aspen Villas. Cycle store areas and garden arrangements adjusted to suit revised ground floor layout. Existing planting adjusted to suit revised layout for building entrance. Bin store enlarged to accommodate 2 x 600L food waste bin. Maintenance steps added to Aspen Villas. Walls, settings, trees, etc. shown. Central Courtyard to Aspen Court amended to include seating and groupings of trees. Cycle store areas and garden arrangements adjusted to suit revised ground floor layout. Existing planting adjusted to suit revised layout for building entrance. Bin store enlarged to accommodate 2 x 600L food waste bin. Amendments to area south of Aspen Villas. Access to the retained water pump room / pump shed amended to retain existing access. Footprint realigned to existing alignment east of Whitebeam House.                                       | H | TS |
| 20100000 | NV | Bin store removed to Aspen Villas. Maintenance area added to Aspen Villas. Bin store arrangement moved to Grafton Terrace. Substation and generator shown to Grafton Mews. Bin store arrangement moved to Grafton Terrace. Maintenance steps added to Aspen Villas. Cycle store areas and garden arrangements adjusted to suit revised ground floor layout. Existing planting adjusted to suit revised layout for building entrance. Bin store enlarged to accommodate 2 x 600L food waste bin. Maintenance steps added to Aspen Villas. Walls, settings, trees, etc. shown. Central Courtyard to Aspen Court amended to include seating and groupings of trees. Cycle store areas and garden arrangements adjusted to suit revised ground floor layout. Existing planting adjusted to suit revised layout for building entrance. Bin store enlarged to accommodate 2 x 600L food waste bin. Amendments to area south of Aspen Villas. Access to the retained water pump room / pump shed amended to retain existing access. Footprint realigned to existing alignment east of Whitebeam House.                                       | G | TS |
| 20107021 | TS | Walls, settings, trees, etc. shown. Central Courtyard to Aspen Court amended to include seating and groupings of trees. Cycle store areas and garden arrangements adjusted to suit revised ground floor layout. Existing planting adjusted to suit revised layout for building entrance. Bin store enlarged to accommodate 2 x 600L food waste bin. Amendments to area south of Aspen Villas. Access to the retained water pump room / pump shed amended to retain existing access. Footprint realigned to existing alignment east of Whitebeam House.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | F | -  |
| 20100017 | TS | Building services updated. Footpath to be resurfaced. Existing parking. Low walls and planting to be retained. New tree planting. Existing parking. Low walls to be removed, new tree planting. Existing play space.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | E | -  |
| 20141217 | TS | Footpath to be resurfaced. Existing parking. Low walls and planting to be retained. New tree planting. Existing parking. Low walls to be removed, new tree planting. Existing play space.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | D | -  |
| 20141104 | TS | Footpath to be resurfaced. Existing parking. Low walls and planting to be retained. New tree planting. Existing parking. Low walls to be removed, new tree planting. Existing play space.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | C | -  |
| 20140600 | TS | Footpath to be resurfaced. Existing parking. Low walls and planting to be retained. New tree planting. Existing parking. Low walls to be removed, new tree planting. Existing play space.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | B | -  |
| 20140428 | TS | Footpath to be resurfaced. Existing parking. Low walls and planting to be retained. New tree planting. Existing parking. Low walls to be removed, new tree planting. Existing play space.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | A | -  |

**turkingtonmartin**

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CLIENT  
**Camden Council**

PROJECT TITLE  
**MAITLAND PARK ESTATE**

DRAWING TITLE  
**LANDSCAPE GA**

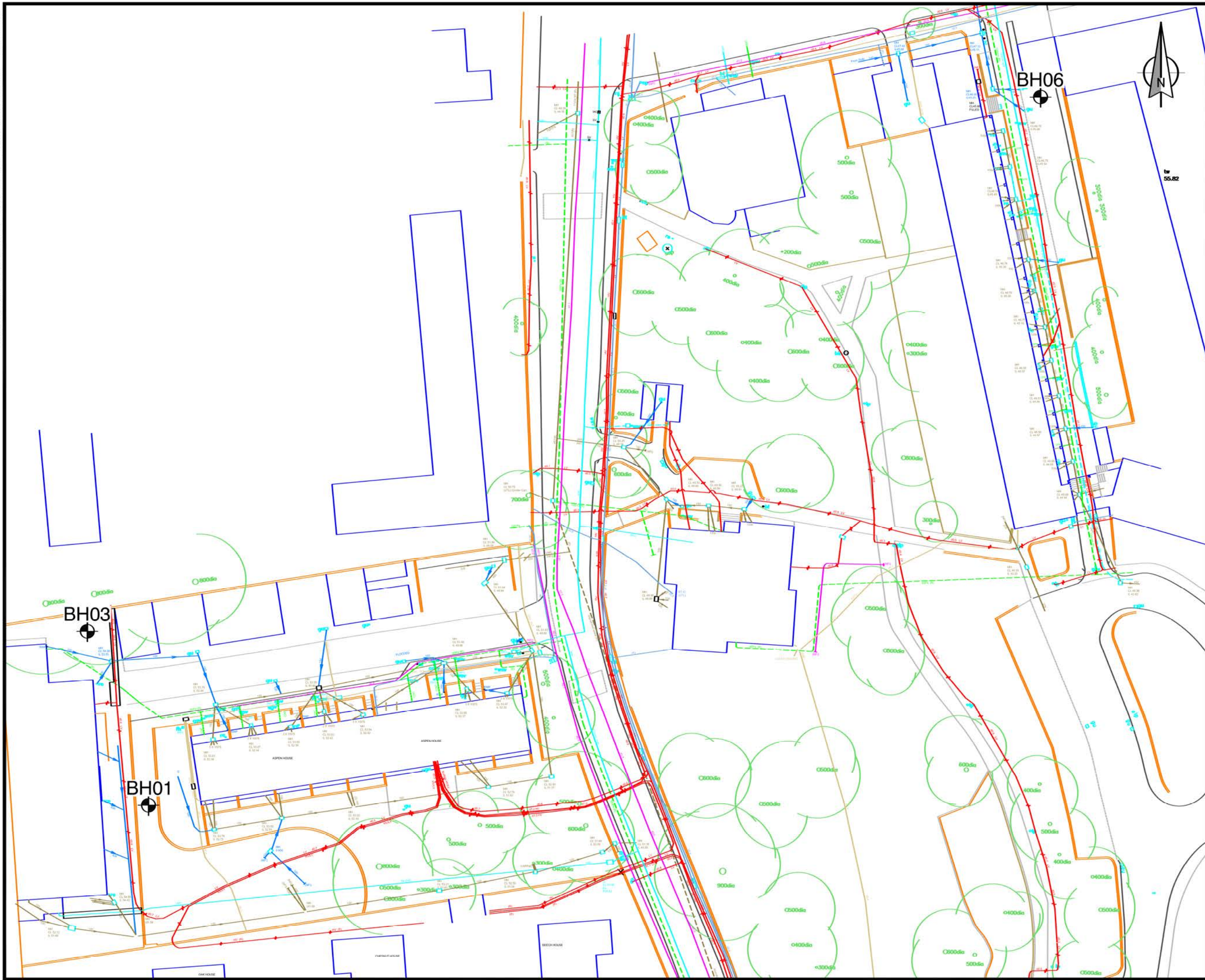
DRAWING STATUS  
**FOR PLANNING**

|                |             |               |
|----------------|-------------|---------------|
| DRAWING SCALE: | DRAWN BY:   | DRAWN DATE:   |
| 1:250          | AD          | 2014.03.10    |
| PAPER SIZE:    | CHECKED BY: | CHECKED DATE: |
| A1             | TS          | 2014.03.10    |

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|-----------------|-----------|
| DRAWING NUMBER: | REVISION: |
| <b>122-L03</b>  | <b>I</b>  |

Turkington Martin LANDSCAPE ARCHITECTS

FN414-D-01 Rev. A  
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Key:  
BH1 Cable Percussive Borehole

Client: EC Harris LLP  
Project: Maitland Park  
Job No: GL18085 Date: May 2014  
Drawing Title: Fieldwork Location Plan

Drawing No: GL18085 - DR002  
Scale: 1 : 500 @ A3  
Drawn by: YN Checked by: GP  
Eastings: 527920 Northings: 184940

Revision history

| Rev | Date | Revision Data |
|-----|------|---------------|
|     |      |               |
|     |      |               |
|     |      |               |

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Certificate Number 5933  
ISO 9001, ISO 14001

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-  Window Sample Location
-  Trial Pit

Not To Scale

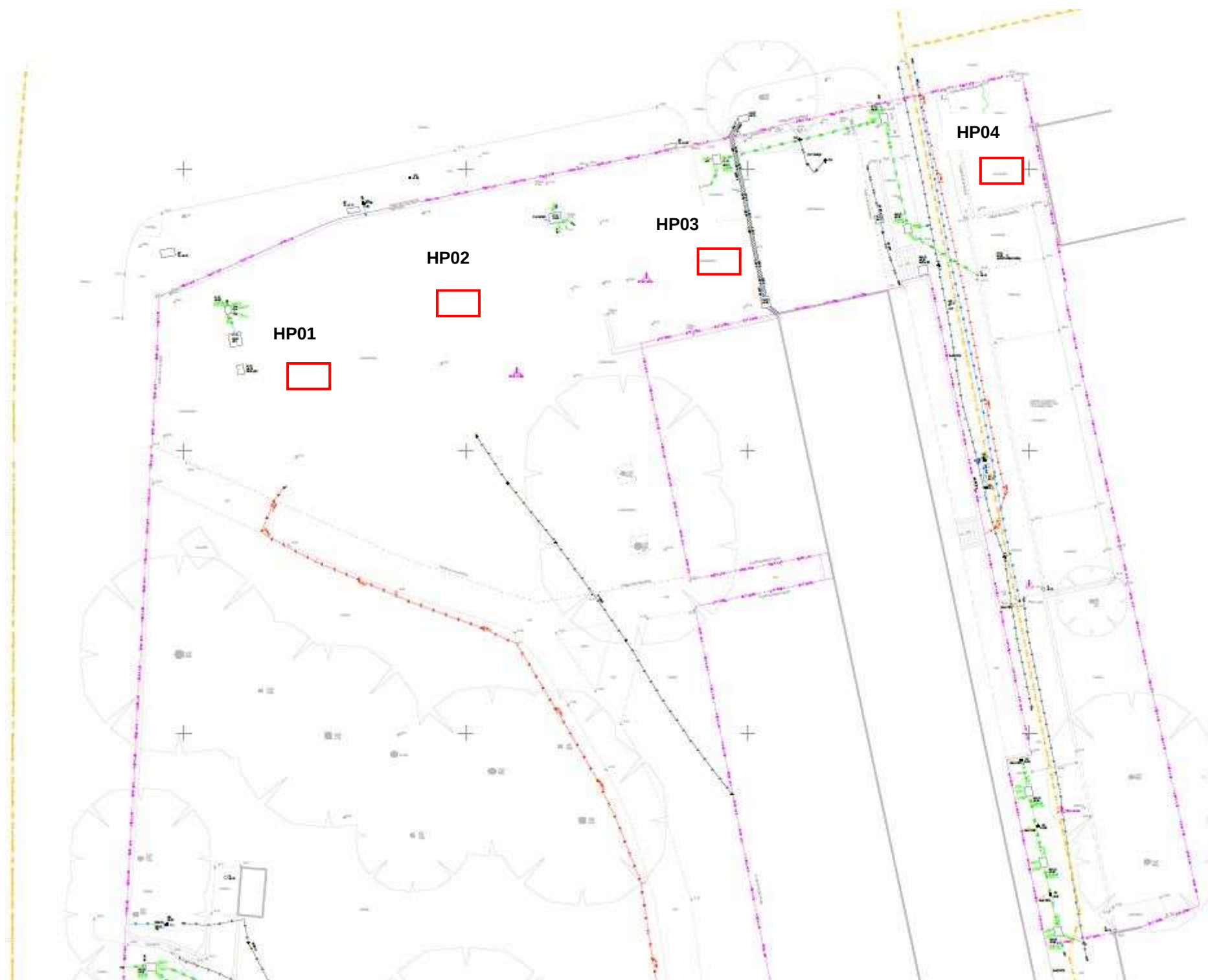
Title  
Exploratory Hole Location  
Plan

Project  
Maitland Park Villas –  
Aspen House



Project No  
R9203

Figure No  
Figure 1



 Location of Hand Pits

Not To Scale

Title  
Exploratory Hole Location Plan

Project  
Maitland Park Villas – TRA Hall



|                     |                        |
|---------------------|------------------------|
| Project No<br>R9203 | Figure No<br>Figure 1a |
|---------------------|------------------------|



## **APPENDIX B**

### **CORRESPONDENCE WITH REGULATORS**

Our ref: Q40227  
Your ref: PP-05747394  
Email: sam.scurlock@quod.com  
Date: 1<sup>st</sup> February 2017



Planning Development Control  
London Borough of Camden  
2nd Floor, 5 Pancras Square  
c/o Town Hall, Judd Street  
London WC1H 9JE

Dear Sir/Madam,

**PROVISION OF 112 RESIDENTIAL UNITS AND REPLACEMENT TENANTS AND RESIDENTS  
ASSOCIATION HALL ACROSS TWO SITES WITH ASSOCIATED MULTI-USE GAMES AREA, LANDSCAPE  
AND ASSOCIATED WORKS, FOLLOWING DEMOLITION OF ASPEN HOUSE, GYMNASIUM AND  
GARAGES AT MAITLAND PARK VILLAS AND TRA HALL AND GARAGES ON GRAFTON TERRACE.**

**APPLICATION TO PARTIALLY DISCHARGE CONDITION 8(A) IN RESPECT OF PLANNING PERMISSION  
REF: 2014/5840/P, AS AMENDED BY 2015/6696/P.**

Please find enclosed an application for the partial discharge of Condition 8 (a) of planning permission ref. 2014/5840/P, issued 31<sup>st</sup> March 2015 (as amended by S73 application ref: 2015/6696/P).

Condition 8 (as amended by S73 application ref: 2015/6696/P) relates to land contamination and states:

***"At least 28 days before development of the relevant phase commences, other than site clearance and preparation, relocation of services, utilities and public infrastructure and demolition or works in relation to the MUGA:***

***a) a written programme of ground investigation for the presence of soil and groundwater contamination and landfill gas shall be submitted to and approved by the local planning authority in writing; and***

***b) following the approval detailed in paragraph (a), an investigation shall be carried out in accordance with the approved programme and the results and a written scheme of remediation measures [if necessary] shall be submitted to and approved by the local planning authority in writing.***

***The remediation measures shall be implemented strictly in accordance with the approved scheme and a written report detailing the remediation shall be submitted to and approved by the local planning authority in writing prior to occupation."***

This submission comprises the following documents:

- Completed application form;
- Decision Notice (ref: 2014/5840/P);

- Decision Notice (ref: 2015/6696/P);
- Council Own Development form;
- Site Location Plan;
- This covering letter;
- Letter from Catherine Tame (Senior Environmental Scientist) at CET Infrastructure dated 20th January 2017;
- Fieldwork Location Plan\* (drawing reference: GL18085-DR002); and
- Trial Pit Locations Plan extract (drawing reference: 25565 TP01 Rev C).

\*To ensure the Fieldwork Location Plan met the planning portal's online file size requirements the document was reduce in resolution, should the council require the original full resolution version a copy can be found [here](#).

The application seeks the partial discharge of condition 8, part (a) of the planning permission (ref: 2014/5840/P, as amended by 2015/6696/P) for the redevelopment of Maitland Park.

The application has been submitted via the Planning Portal (Ref: PP-05747394 and a cheque for £97 made payable to the London Borough of Camden will be forwarded under separate cover for the requisite application fee.

I look forward to receiving confirmation of validation shortly. Please do not hesitate to contact me should you require any further information.

Yours faithfully,



Sam Scurlock  
**Assistant Planner**

Price and Myers LLP  
37 Alfred Place  
London  
WC1E 7DP

t: 01622 858545  
f: 01622 858544  
w: [www.cet-uk.com](http://www.cet-uk.com)

For the attention of Ms Rachel Betts

## Geotechnical Department

Our ref: 351221

20 January 2017

Dear Rachel,

### **RE: MAITLAND PARK, CAMDEN – REVIEW OF EXISTING CONTAMINATED LAND ASSESSMENTS**

CET Infrastructure (CET) was instructed by Price and Myers LLP (P&M) to carry out a review of existing site investigation and risk assessment reports relating to the Maitland Park study site located at Maitland Villas, Camden, London NW3 2HG.

It is understood that the site currently comprises residential apartments, a gym building, garages, car parking, access and communal soft landscaped areas. It is further understood that the site is to be redeveloped into three four and five storey residential apartment blocks with associated access and communal landscaped areas.

Several reports have been supplied for review by CET. The following includes only those reports that comment on the potential contaminated land issues and therefore any purely geotechnical reports have been excluded from the review.

#### **GEOTECHNICAL AND ENVIRONMENTAL DESK STUDY (RAMBOLL, JANUARY 2013)**

The first supplied Ramboll report concerning land contamination comprised a desk study that established the following regarding the site and its environmental setting:

- The study site comprises an irregular shaped plot of land to the east and west of Maitland Villas and covers an area of approximately 1.23Ha. The site is centred at National Grid reference TQ 279 849.

- Historically the site comprised residential dwellings, parkland and a school. Two electrical substations were constructed during the 1950s and 1970s to the south of the study site. The surrounding area was predominantly remained residential throughout the mapping period.
- The site is underlain by the London Clay Formation, which was classified as Unproductive Strata by the Environment Agency. No superficial deposits are mapped at the site, however historical borehole logs at the site indicate the presence of possible Made Ground and Head overlying the London Clay Formation.
- The site is not located within a groundwater Source Protection Zone (SPZ) and no water abstractions are recorded within 250m of the study site. The nearest surface water feature is the River Fleet, a tributary of the River Thames, which flows underground and forms part of the London sewer system some 150m north east of the site.
- No authorised or historical landfill sites are recorded within 1km of the study site. Three local authority pollution and prevention controls were recorded within 250m of the site, relating to dry cleaners some 100m south, 120m north and 230m east. In addition to the dry cleaners several trade activities were recorded in the vicinity of the site, these included a laundry, MOT testing station, scaffold suppliers, pharmacy, hardware store, car dealers and an ice cream manufacturer.
- The closest sensitive land use is Belsize Wood situated approximately 400m north west of the site.
- The BGS national soil mapping project indicates there is the potential for arsenic and lead in excess of the appropriate residential standards (excluding home grown produce).

The Ramboll report then went on to discuss the contaminated land risks. Firstly the presence of two historical substations on site was considered to represent a source of poly chlorinated bipenyls (PCBs) and hydrocarbons. Secondly the historical foundations and demolition rubble associated with the buildings previously on site could be encountered during the construction works and could contain asbestos due to the age of the material. No current on site or off site land uses were identified by Ramboll that were considered to represent a significant source of contamination. However, the report indicated that some on site garages are to be demolished and hydrocarbons may be present within any adjacent drains. Finally, it was judged that there was the potential of elevated concentrations of lead and arsenic that could be mobilised by infiltration of water and migrate through the Made Ground and any superficial deposits.

Based on the historical on site land uses and off site current and historical uses identified by the Ramboll assessment they considered that there was generally a low to moderate risk of the study site being impacted by a range of contaminants including PCBs, hydrocarbons, asbestos, lead and arsenic. It was concluded that such contamination could have the potential to pose a risk to human receptors.

Ramboll recommended that a combined geotechnical and contaminated land ground investigation should be undertaking comprising the formation of cable percussion boreholes and the installation of gas and groundwater monitoring wells.

## CONTAMINATED LAND LETTER REPORT (RAMBOLL, MAY 2014)

In order to more accurately assess the risk posed to human health a limited intrusive ground investigation was undertaken by Ramboll. The site investigation comprised the formation of three cable percussive boreholes, BH1, BH3 and BH6, to depths of between 25m and 35m below ground level (bgl). In addition BH1 and BH6 were installed with gas and groundwater monitoring wells.

Made Ground was found to be present in all locations to a maximum depth of 2.0m bgl. The Made Ground was described as granular material with fragments of asphalt, wood and metal. The gravels comprised brick, chalk, flint, wood, metal, asphalt, concrete and tile. Directly beneath the Made Ground was firm to stiff clay, identified as the London Clay Formation. No superficial deposits or groundwater were encountered during the investigation.

Five samples were recovered for testing, three from the Made Ground at 0.5m and two from BH1 and BH3 at 1.5m bgl in the underlying natural soils. The results were compared to the available Soil Guideline Values (SGVs) and PAHs, lead and vanadium were found to exceed the screening criteria that considered a residential with gardens end use. Vanadium was slightly elevated in both the Made Ground and underlying natural soils. Concentrations of hydrocarbons exceeded the UKWIR threshold values for plastic water supply pipes in BH3, however the elevated TPH and PAHs were attributed to the presence of asphalt in the Made Ground. The asphalt was considered unlikely to pose a significant risk of percolation to the water supply pipes due to its limited leachability.

Groundwater samples were recovered from the monitoring wells and analysed for a range of contaminants. The concentrations of the determinands were low and were not considered to pose a significant risk to the water environment.

Soil gas monitoring was undertaken during March and April 2014. The barometric pressure ranged between 1002 and 1016mb. The maximum concentrations of methane and carbon dioxide were 0.1% and 1.7% respectively and the maximum flow was 0.1l/h. Depleted oxygen was not encountered. A Characteristic Situation of CS1 was calculated from the gas data and as a result no specific ground gas protection measures were recommended by Ramboll.

The updated conceptual site model recorded moderate risks from ground gas, which may require mitigation measures according to Ramboll. Risks to end users, ground workers and buried services were assessed as moderate from the presence of elevated concentrations of heavy metals, PAHs and TPH. The risks to end users and groundworkers from elevated concentrations of vanadium were also assessed as moderate.

It should be noted that in the report Ramboll used the SGVs as screening values, these have now been superseded and therefore the established assessment criteria are not deemed to be suitable for use in the current regulatory context. The following section comprises an updated generic risk assessment using the data from the Ramboll report.

### Supplementary Generic Risk Assessment

In order to ascertain the significance of the results in a current regulatory context data was extracted from the Ramboll report was subjected to a Generic Risk Assessment. Based on the proposed end use of the study site the initial screen of the chemical data was made against available Suitable 4 Use Levels (S4ULs) and Category 4 Screening Levels (C4SLs). For the purposes of this assessment S4ULs selected to perform an initial screen of the chemical data reflected a 'residential end use without home grown produce' (RwoHP). In this instance the most sensitive potential receptor is judged to be a female child between the age of 0 and 6 years. The consumption of contaminants via home grown fruit and vegetables has not been considered as an applicable pathway.

A comparison of the metals recorded by the analysis with the corresponding generic screening criteria is presented in the following table:

| Contaminant           | Samples                                                                                                                                                                 |                           | S4UL*<br>(RwoHP) |                                                    |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------|----------------------------------------------------|
|                       | Maximum Conc.<br>(mg/kg)                                                                                                                                                | Location                  | S4UL<br>(mg/kg)  | No. Samples<br>exceeding<br>assessment<br>criteria |
| Arsenic               | 14                                                                                                                                                                      | BH1 @ 0.5m                | 40               | 0                                                  |
| Cadmium               | 0.3                                                                                                                                                                     | BH3 @ 0.5m                | 85               | 0                                                  |
| Chromium III          | 50                                                                                                                                                                      | BH1/BH3 @ 1.5m            | 910              | 0                                                  |
| Mercury               | <0.3                                                                                                                                                                    | N/A                       | 56               | 0                                                  |
| Lead <sup>#</sup>     | <b>460</b>                                                                                                                                                              | BH3 @ 0.5m                | 310              | <b>1</b>                                           |
| Nickel                | 44                                                                                                                                                                      | BH3 @ 1.5m                | 180              | 0                                                  |
| Copper                | 45                                                                                                                                                                      | BH3 @ 0.5m                | 7100             | 0                                                  |
| Selenium              | <1.0                                                                                                                                                                    | N/A                       | 430              | 0                                                  |
| Vanadium              | 88                                                                                                                                                                      | BH6 @ 0.5m/ BH3<br>@ 1.5m | 1200             | 0                                                  |
| Zinc                  | 110                                                                                                                                                                     | BH3 @ 0.5m                | 40 000           | 0                                                  |
| <b>Notes to Table</b> |                                                                                                                                                                         |                           |                  |                                                    |
| *                     | Most appropriate supplied S4ULs are based on a 'residential without home grown produce' end use, a sandy loam soil type, pH of 7 and a soil organic matter (SOM) of 6%. |                           |                  |                                                    |
| #                     | Category 4 Screening Level (2014) used in absence of suitable S4UL.                                                                                                     |                           |                  |                                                    |

As the above table indicates, with the exception of lead in sample BH3 at 0.5m, the concentrations of metals recorded by the analysis did not exceed the respective threshold criteria. However, one concentration of lead in the Made Ground was recorded in excess of the corresponding S4UL and is therefore judged to have the potential to pose a significant risk to future site users via the direct contact, ingestion and dust inhalation exposure pathways.

Asbestos was not detected in any of the samples screened by the laboratory.

A summary of the PAH compounds recorded by the analysis is included in the following table:

| Contaminant           | Samples                                                                                                                                                                 |            | S4UL*<br>(RwoHP) |                                                    |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------|----------------------------------------------------|
|                       | Maximum Conc.<br>(mg/kg)                                                                                                                                                | Location   | S4UL<br>(mg/kg)  | No. Samples<br>exceeding<br>assessment<br>criteria |
| Naphthalene           | 1.5                                                                                                                                                                     | BH3 @ 0.5m | 2.3              | 0                                                  |
| Acenaphthylene        | 4.5                                                                                                                                                                     | BH3 @ 0.5m | 2900             | 0                                                  |
| Acenaphthene          | 8.8                                                                                                                                                                     | BH3 @ 0.5m | 3000             | 0                                                  |
| Fluorene              | 7.6                                                                                                                                                                     | BH3 @ 0.5m | 2800             | 0                                                  |
| Phenanthrene          | 110                                                                                                                                                                     | BH3 @ 0.5m | 1300             | 0                                                  |
| Anthracene            | 27                                                                                                                                                                      | BH3 @ 0.5m | 31 000           | 0                                                  |
| Fluoranthene          | 180                                                                                                                                                                     | BH3 @ 0.5m | 1500             | 0                                                  |
| Pyrene                | 160                                                                                                                                                                     | BH3 @ 0.5m | 3700             | 0                                                  |
| B(a)A                 | <b>77</b>                                                                                                                                                               | BH3 @ 0.5m | 11               | <b>1</b>                                           |
| Chrysene              | <b>70</b>                                                                                                                                                               | BH3 @ 0.5m | 30               | <b>1</b>                                           |
| B(b)F                 | <b>97</b>                                                                                                                                                               | BH3 @ 0.5m | 3.9              | <b>1</b>                                           |
| B(k)F                 | 30                                                                                                                                                                      | BH3 @ 0.5m | 110              | 0                                                  |
| B(a)P                 | <b>69</b>                                                                                                                                                               | BH3 @ 0.5m | 3.2              | <b>2</b>                                           |
| I(123-cd)P            | 36                                                                                                                                                                      | BH3 @ 0.5m | 45               | 0                                                  |
| D(ah)A                | <b>11</b>                                                                                                                                                               | BH3 @ 0.5m | 0.31             | <b>2</b>                                           |
| B(ghi)P               | 41                                                                                                                                                                      | BH3 @ 0.5m | 360              | 0                                                  |
| <b>Notes to Table</b> |                                                                                                                                                                         |            |                  |                                                    |
| *                     | Most appropriate supplied S4ULs are based on a 'residential without home grown produce' end use, a sandy loam soil type, pH of 7 and a soil organic matter (SOM) of 1%. |            |                  |                                                    |

As the above table indicates, potentially significant concentrations in excess of the corresponding S4ULs were detected in the two samples of Made Ground recovered from BH1 and BH3 at 0.5m. Reference to the corresponding exploratory hole log identifies the tested soils to contain fragments of asphalt, which is known to represent a potential source of PAH contamination.

A summary of the recorded concentrations of petroleum hydrocarbons is provided in the following table:

| Contaminant           | Samples                                                                                                                                                                        |            | S4UL*<br>(RwoHP) |                                                    |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------|----------------------------------------------------|
|                       | Maximum Conc.<br>(mg/kg)                                                                                                                                                       | Location   | S4UL<br>(mg/kg)  | No. Samples<br>exceeding<br>assessment<br>criteria |
| TPH C10-C12 aro       | 2.5                                                                                                                                                                            | BH3 @ 0.5m | 250              | 0                                                  |
| TPH C12-C16 ali       | 12                                                                                                                                                                             | BH3 @ 0.5m | 1100             | 0                                                  |
| TPH C12-C16 aro       | 110                                                                                                                                                                            | BH3 @ 0.5m | 1800             | 0                                                  |
| TPH C16-C35 ali       | 152                                                                                                                                                                            | BH3 @ 0.5m | 65 000           | 0                                                  |
| TPH C16-C21 aro       | 790                                                                                                                                                                            | BH3 @ 0.5m | 1900             | 0                                                  |
| TPH C21-C35 aro       | 1200                                                                                                                                                                           | BH3 @ 0.5m | 1900             | 0                                                  |
| <b>Notes to Table</b> |                                                                                                                                                                                |            |                  |                                                    |
| *                     | <i>Most appropriate supplied S4ULs are based on a 'residential without home grown produce' end use, a sandy loam soil type, pH of 7 and a soil organic matter (SOM) of 1%.</i> |            |                  |                                                    |

As the above table demonstrates, none of the petroleum hydrocarbon compounds detected by the analysis exceeded the corresponding S4ULs and as such it is considered that they are likely to pose a negligible risk to human receptors.

The concentrations of determinands in the groundwater were generally found to be below the limit of detection and where present were below the relevant respective generic screening criteria including the Environmental Quality Standards and the UK Drinking Water Standards.

The Ramboll report concluded that potential sources of ground contamination identified at the site include vanadium in the natural soils and heavy metals and PAHs in the Made Ground. In addition the recorded concentrations of TPH could impact buried water supply pipes. The report recommended that further investigation would be required due to the three locations that were cancelled as a result of access issues and the investigation should also target the electrical substation. In addition the risks would only be present where the impacted soils are not covered by buildings, hard surfacing or clean topsoil when the works are completed.

## SUMMARY & CONCLUSIONS

CET concur that based upon the findings of the supplied reports it is considered that further sampling at the study site is required to increase the dataset and gain a better understanding of the spatial extent of the identified contamination with respect to human health. It is recommended the future investigation works should focus on the Made Ground and shallow soils that future site users and construction workers are most likely to come into contact with.

Based on the contamination source map produced by Ramboll it appears that there is one electricity substation located on the southern boundary of study site. It is recommended that the substation is visually inspected to look for obvious signs of a leak, such as oily staining or vegetation die back. In addition at least one on site exploratory hole should be located as close to the substation as possible so that samples can be recovered for environmental testing.

As the site is underlain by the London Clay Formation, Ramboll did not identify any sensitive water receptors within the vicinity of the site and no significant concentrations of determinands were recorded in the samples tested to date it is considered the risks to controlled waters are negligible. Furthermore, it is unlikely that any further testing will be required.

It is not understood why Ramboll considered there to be a moderate risk from ground gases based on the results to date. The site has been classified as a Characteristic Situation 1 by Ramboll, for which no specific ground gas protection measures are considered necessary. In order to fully resolve the risks from ground gas it may be prudent to undertake one further round of monitoring is undertaken during a period of low pressure (<1000mb) in line with current best practice.

Further to the above, CET have been commissioned to undertake a further phase of ground investigation comprising seven hand dug trial pits and five window sampler boreholes. An experienced geoenvironmental engineer will be overseeing the works to inspect, log and recover samples for environmental testing. The exact suite of testing will include the determinands from the previous reports and be tailored to any pertinent observations made during the site works. During the works the existing monitoring wells will be located to confirm they are serviceable. A risk assessment will be undertaken within the current regulatory framework and will include an update conceptual site model with appropriate source-pathway-receptor linkages. If significant contamination is identified than a remediation plan will be devised and agreed with the Local Authority. Any subsequent remediation will be subject to appropriate validation and verification.

We trust that the above meets your requirements. However, please do not hesitate to contact us with any additional questions or queries.

Kind regards,



**Catherine Tame** BSc MSc MEnvSc  
**Senior Environmental Scientist**  
For and on behalf of CET Infrastructure

## Simon Mason

---

**From:** Arthur, Anona  
**Sent:** 06 March 2017 15:48  
**To:** Peres Da Costa, David  
**Subject:** Planning Application: (2017/0661/P) Land bounded by Grafton Terrace, Maitland Park Villas & Maitland Park, containing Existing TRA Hall & Garages; & Land adjacent to Maitland Park Villas containing existing Aspen House, gymnasium & garage

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Dear David

Site Address Application Type: Approval of Details Development Type: Approval or variation of Conditions  
Proposal: Details of contaminated land (ground investigation) required by condition 8a of planning permission 2014/5840/P dated 31/03/2015 (as amended by 2015/6696/P dated 14/04/2016) for 'provision of 112 residential units and replacement Tenants and Residents Association hall across two sites with associated multi-use games area, landscape and associated works, following demolition of Aspen House, gymnasium and garages at Maitland Park Villas and TRA Hall and garages on Grafton Terrace'.

Thank you for consulting me on the above application. I have reviewed CET's Report letter dated 20th January 2017 regarding the Review of the Contaminated Land Assessments and I have no adverse comments to make. Therefore, I have no objections to the discharge of Condition 8(a) only.

Regards

Anona Arthur  
Environmental Health Officer / Contaminated Land Officer

Telephone: 020 7974 2990

## APPENDIX C

### APPROACH TO HUMAN HEALTH RISK ASSESSMENT

## Human Health Risk Assessment – Technical Basis

In accordance with Environment Agency guidance document CLR 11, Model Procedures for the Management of Land Contamination (EA, 2004) human health risk assessment follows a tiered approach. A Preliminary Risk Assessment (PRA) is the first tier of the assessment. The second stage of the tiered approach comprises a Generic Quantitative Risk Assessment (GQRA). The GQRA is undertaken initially by comparing maximum measured soil contaminant concentrations with Generic Assessment Criteria (GAC) that have been derived for a series of potential land uses, including residential, commercial, open space and allotments. Generic Assessment Criteria (GAC) have been selected from the following sources:

- CL:AIRE Category 4 Screening Levels (C4SL);
- LQM/CIEH Suitable for Use Levels (S4UL)[1]; and
- CL:AIRE/EIC/AGS GAC

The GAC have been derived using the Environment Agency Contaminated Land Exposure Assessment (CLEA) model, for a range of land uses and exposure scenarios, including:

- Residential with the consumption of homegrown produce;
- Residential without the consumption of homegrown produce;
- Commercial;
- Allotments;
- Public Open Space near residential housing (POSresi); and
- Public Open Space public park scenario (POSpark).

Provisional C4SL values for a total of six priority substances (arsenic, benzene, benzo(a)pyrene, cadmium, hexavalent chromium and lead) were produced by CL:AIRE, and published in March 2014. A policy companion document was published by DEFRA in March 2014, which confirmed the final C4SL for these determinands.

It should be noted that the C4SLs have been derived using toxicological criteria that are presented as posing a 'low level of toxicological concern', in comparison with previous Soil Guidelines Values (SGVs) and other existing GAC, which have been derived using toxicological criteria that represent a 'minimal risk' to human health.

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The LQM/CIEH Suitable for Use Levels (S4ULs) have been derived in accordance with the changes in exposure modelling presented within the C4SL framework, whilst still utilising a set of toxicological criteria that are set within the 'minimal risk' range. The S4ULs were published to offer a set of collated information on the toxicity and transport properties for a number of common contaminants.

The CL:AIRE/EIC/AGC Generic Assessment Criteria were published in December 2009. Assessment criteria were produced using CLEA v1.06 for a total of 35 No. less common contaminants, in accordance with EA CLEA guidance. The GAC were intended to complement the SGVs produced by the EA, and the LQM/CIEH GAC that were current at the time.

The current SOCOTEC approach to human health risk assessment is to use the various assessment criteria available in the following order of preference: S4UL > EIC GAC > C4SLs. Where contaminants fail the initial screen against S4UL or EIC GAC, a further assessment may be made by screening against C4SLs.

## APPENDIX D

### SOIL SCREENING TABLE

Table A Human Health Screen

| Determinand                                                    | Maximum Measured Concentration (mg/kg) | Generic Assessment Criterion (GAC) (mg/kg) residential with consumption of home grown produce | No. of results exceeding GAC |
|----------------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------|
| Metals and Semi-Metals                                         |                                        |                                                                                               |                              |
| Arsenic                                                        | 22.2                                   | 37                                                                                            | 0 (38)                       |
| Boron                                                          | 2.4                                    | 290                                                                                           | 0 (36)                       |
| Cadmium                                                        | 1.54                                   | 11                                                                                            | 0 (38)                       |
| Chromium (total)                                               | 65.2                                   | 910                                                                                           | 0 (38)                       |
| Hexavalent Chromium                                            | 0.7                                    | 6                                                                                             | 0 (38)                       |
| Copper                                                         | 166.6                                  | 2400                                                                                          | 0 (38)                       |
| Lead                                                           | 460                                    | 200                                                                                           | 7 (38)                       |
| Mercury                                                        | 1.5                                    | 40                                                                                            | 0 (38)                       |
| Nickel                                                         | 59.5                                   | 180                                                                                           | 0 (38)                       |
| Selenium                                                       | 2.2                                    | 250                                                                                           | 0 (38)                       |
| Zinc                                                           | 293.4                                  | 3700                                                                                          | 0 (38)                       |
| Vanadium                                                       | 88                                     | 410                                                                                           | 0 (4)                        |
| Polycyclic Aromatic Hydrocarbons                               |                                        |                                                                                               |                              |
| Acenaphthene                                                   | 8.8                                    | 510                                                                                           | 0 (36)                       |
| Acenaphthylene                                                 | 4.5                                    | 420                                                                                           | 0 (36)                       |
| Anthracene                                                     | 27                                     | 5400                                                                                          | 0 (36)                       |
| Benzo(a)anthracene                                             | 77                                     | 11                                                                                            | 2 (36)                       |
| Benzo(a)pyrene                                                 | 69                                     | 2.7                                                                                           | 11 (36)                      |
| Benzo(b)fluoranthene                                           | 97                                     | 3.3                                                                                           | 10 (36)                      |
| Benzo(g,h,i)perylene                                           | 41                                     | 340                                                                                           | 0 (36)                       |
| Benzo(k)fluoranthene                                           | 30                                     | 93                                                                                            | 0 (36)                       |
| Chrysene                                                       | 70                                     | 22                                                                                            | 1 (36)                       |
| Dibenzo(a,h)anthracene                                         | 11                                     | 0.28                                                                                          | 11 (36)                      |
| Fluoranthene                                                   | 180                                    | 560                                                                                           | 0 (36)                       |
| Fluorene                                                       | 7.6                                    | 400                                                                                           | 0 (36)                       |
| Indeno(1,2,3-c,d)pyrene                                        | 36                                     | 36                                                                                            | 0 (36)                       |
| Naphthalene                                                    | 1.5                                    | 5.6                                                                                           | 0 (36)                       |
| Phenanthrene                                                   | 110                                    | 220                                                                                           | 0 (36)                       |
| Pyrene                                                         | 160                                    | 1200                                                                                          | 0 (36)                       |
| Total Petroleum Hydrocarbons and BTEX Compounds                |                                        |                                                                                               |                              |
| GRO C06-C08                                                    | <0.277                                 | 230                                                                                           | 0 (34)                       |
| TPH >C08-C10                                                   | <2.82                                  | 65                                                                                            | 0 (36)                       |
| TPH >C10-C12                                                   | 2.5                                    | 180                                                                                           | 0 (36)                       |
| TPH >C12-C16                                                   | 122                                    | 330                                                                                           | 0 (36)                       |
| TPH >C16-C21                                                   | 790                                    | 540                                                                                           | 1 (36)                       |
| TPH >C21-C35                                                   | 1200                                   | 1500                                                                                          | 0 (36)                       |
| Benzene                                                        | <0.014                                 | 0.17                                                                                          | 0 (36)                       |
| Toluene                                                        | <0.014                                 | 290                                                                                           | 0 (36)                       |
| Ethylbenzene                                                   | <0.014                                 | 110                                                                                           | 0 (36)                       |
| Xylene-m / p                                                   | <0.028                                 | 130                                                                                           | 0 (36)                       |
| Xylene-o                                                       | <0.014                                 | 140                                                                                           | 0 (36)                       |
| Other Compounds (including VOCs greater than LOD)              |                                        |                                                                                               |                              |
| Asbestos                                                       | 0.01%                                  | presence of fibres                                                                            | 8 (36)                       |
| Cyanide (free)                                                 | <1                                     | 22                                                                                            | 0 (36)                       |
| Phenol (total)                                                 | <2                                     | 550                                                                                           | 0 (36)                       |
| Polychlorinated Biphenyls (PCBs) (non-dioxin like 7 congeners) | 0.053                                  | 0.35                                                                                          | 0 (32)                       |
| Bromoform                                                      | 0.0023                                 | 5.9                                                                                           | 0 (12)                       |
| cis 1,2-Dichloroethene                                         | 0.0175                                 | 0.2                                                                                           | 0 (12)                       |
| Tetrachloroethene                                              | 0.0295                                 | 0.39                                                                                          | 0 (12)                       |
| Trichloroethene                                                | 0.03                                   | 0.034                                                                                         | 0 (12)                       |

Inorganic mercury GAC used  
Lowest of aliphatic or aromatic TPH fraction GAC conservatively used