

Confidential

Greenwood Place

Ground Investigation Specification

For

Kier Construction London

Project No:

12291

December 2015

Campbell Reith Hill LLP
Friars Bridge Court
41-45 Blackfriars Road
London
SE1 8NZ

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THE GREENWOOD CENTRE
GROUND INVESTIGATION SPECIFICATION

Project Specification Revision Record

Date	Clause Revisions	Prepared By	Checked By
21/12/15	Draft for comment	JHC	AF

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Invitation to Tender

12291

Date: December 2015

Dear Sirs

THE GREENWOOD CENTRE

Having expressed an interest in submitting a Fixed-Price Tender for the site investigation to the above project, we have pleasure in enclosing, on behalf of Kier Construction London, one set of tender documents together with a copy of the Instructions to Tenderers for your consideration.

Your attention is drawn to the following:

1. Pre-selection has been undertaken and the number of tenders invited is three.
2. Information as to the site, the main construction works and the Employer's Requirements are detailed in the tender documents in Schedules 1 to 5.
3. The successful tenderer will be in full charge of the supervision and direction of the investigation, and he will be responsible for advising ourselves of any changes which, in his opinion, are necessary to ensure the satisfactory performance and completion of the investigation.
4. Tenderers must accept responsibility for the proper performance of the investigation.
5. Unless noted otherwise in Schedule 1, the Employer has appointed ourselves to act as the Investigation Supervisor for the investigation contract.
6. Having regard to the constraints imposed by the Employer and our knowledge of the site we have prepared a suggested layout for the investigation as indicated on the attached drawing. The tenderers will be responsible for advising us of any shortcomings of which they might reasonably be aware in these proposals when submitting their tender.
7. Tenders will be assessed on their technical merits as well as price. Accordingly, the Employer gives no guarantee that the lowest tender or any tender will be accepted.
8. To be considered, tenders must be submitted without qualifications in accordance with the attached Instructions to Tenderers, and must be received at the address specified on or before **14/01/16**

If, after reviewing the documentation, you are unable to submit a tender we will be grateful if you would advise the undersigned by telephone or email at the earliest opportunity.

Yours faithfully
for and on behalf of CAMPBELL REITH HILL LLP

Encls

THE GREENWOOD CENTRE
Site Investigation Contract

Instructions to Tenders

1. The Employer has endeavoured to provide (but without responsibility) desk study information as he has available to assist tenderers. Tenderers remain responsible for collecting any further information required and for evaluating all relevant information necessary to ensure the proper performance of the investigation.
2. The successful tenderer is required to indemnify the Employer against any damage caused by his activities to underground or above ground services, infrastructure or Japanese knotweed.
3. The following specification is based on the UK Specification for Ground Investigation, 2nd Edition, published by Thomas Telford Ltd 2012. Tenderers should note the contents and requirements of Schedules 1 to 5 and they must prepare, complete and submit with their tender Schedules 6 to 8 inclusive, as they will all form part of the Contract.
4. In preparing and completing Schedules 6 to 8 the Tenderer must take account of and comply with the requirements of Schedules 1 to 5. Any tenders which do not contain all the information required or are divergent from the requirements of Schedules 1 to 5 may be rejected. To assist tenderers we provide the following notes for guidance in completing these schedules.

5. Schedule 6: List of Activities

This should contain the following:-

- a) An indication of the minimum period for mobilisation from placement of order together with an estimate of the earliest start date.
- b) A detailed program indicating time periods required for the various phases of investigation including site works, monitoring periods/dates, production of testing schedules, laboratory testing draft and final report production.
- c) Details of areas of land required for investigation and for storage of investigation equipment.
- d) Proposals for accessing any confined/enclosed areas of land for investigation purposes.
- e) A description of any particular investigative procedures or equipment proposed which warrant further mention due to particular merits.

6. Schedule 7: Information Required

The tenderer is to list any information concerning the investigation which he requires the Employer to provide and he must state when each item of information will be required.

7. Schedule 8: List of Premises and Subcontractors

The Employer needs to know the office where the Contract will be administered from together with the address of any subcontractors (including laboratories) to be used.

The tenderer shall also provide confirmation of professional accreditation and quality assurance schemes in which the tenderer and subcontractors participate.

8. Schedules 6 to 8 should be completed and may include additional documents, provided these are clearly incorporated in, and physically attached to, the form provided.

9. Bill of Quantities

The Tenderers are required to complete the attached Bill of Quantities for the Investigation. This Bill of Quantities is based upon that included in the UK Specification for Ground Investigation published by Thomas Telford Ltd in 2012 and will be used by the Engineer to ascertain and determine by admeasurement the value of all payments to the Contractor.

In preparing the Bill of Quantities, tenderers should comply with the following:-

- a) The Bill of Quantities must be prepared in accordance with the Preamble provided in the Specification.
 - b) All quantities (including those of sampling and testing) must be a true and accurate estimate of the anticipated final quantities and the rates must reflect the actual costs for each particular element of the investigation.
 - c) The Bill of Quantities is to be prepared on the basis of the investigation outlined on the attached CampbellReith drawing(s) together with the requirements of Schedules 1 to 5. Where the tenderer is of the opinion that there are other works required in addition to those described in the Schedules a supplementary Bill of Quantities is to be prepared and included in the tender for the items which the specialist feels should be carried out as a result of his review.
 - d) The Bill of Quantities should include an item which identifies the rate for further technical advice following completion of the investigation.
 - e) The Bill of Quantities should include a general contingency items equal to 10% of the Tender Sum which will only be expended in whole or in part on the instruction of the Engineer.
10. Tenderers must be prepared to enter into a Contract based on the Conditions of Contract provided after the Form of Tender. The successful tenderer should indicate his willingness to enter into a collateral warranty, in the form of warranty published by the Construction Industry Council (appended) on up to two occasions, together with his fee for so doing.
11. The following completed documents must be submitted with the tender:
- Form of Tender (and Appendix)
 - Form of Agreement
 - List of Activities (Schedule 6)
 - Information Required (Schedule 7)
 - List of Premises and Subcontractors (Schedule 8)
 - Form of Warranty
 - Bill of Quantities
12. All works must be carried out in accordance with the appended Pre-Tender Designer's Risk Assessment. CDM Regulations apply and the successful tenderer will be required to act as Principal Contractor where noted in Schedule 1.
13. Unless stated elsewhere, tenderers are expected to have visited site during the preparation of their tender. No additional costs to the client will be considered as a result of the tenderer not having inspected the site.
14. Tenders must be submitted by e-mail "**SI Tender (12291.)**" to joshchastney@campbellreith.com and must be received on or before 14/01/16.

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Conditions of Contract

Form of Tender

Form of Tender (Appendix)

Form of Agreement

Schedules 1-8

Bill of Quantities

Forms of Warranty

Desk Study Information

Designer's Risk Assessment

Drawings

CONDITIONS OF CONTRACT

The Terms and Conditions of appointment shall be the ICC Infrastructure Conditions of Contract - Ground Investigation Version, August 2011. The following amendments, omissions and additions apply:

FORM OF TENDER

To **Kier Construction London**
c/o CampbellReith
SI Tender (12291)
Friars Bridge Court
41-45 Blackfriars Road
London
SE1 8NZ

Dear Sirs / Madam

THE GREENWOOD CENTRE

Having examined the Drawings, Conditions of Contract, Specification and Schedules 1 to 5 and having completed the Bill of Quantities for the construction of the above-mentioned investigations and Schedules 6 to 8, we offer to undertake and complete the whole of the said investigations in conformity with the said Drawings, Conditions of Contract, Specification, Schedules and Bill of Quantities for such sum as may be ascertained in accordance with the said Conditions of Contract.

We warrant that all skill and care was taken in designing the Investigation and acknowledge that the Bill of Quantities includes everything that could have reasonably been foreseen for the satisfactory completion of the Investigation.

We undertake to complete and deliver the whole of the investigations comprised in the Contract with reasonable diligence within the times stated in the Contract.

Unless and until a formal agreement is prepared and executed this Tender together with your written acceptance thereof, shall constitute a binding Contract between us.

We understand that you are not bound to accept the lowest or any tender you may receive.

Yours sincerely

Signature.....

Address.....

Date.....

FORM OF TENDER (APPENDIX)**(NOTE: Relevant Clause numbers are shown in brackets)****Appendix - Part 1 (to be completed prior to the invitation to tender)**

- | | | |
|-----|--|---|
| 1. | Name of the Employer | Kier Construction London |
| | Address: | 2 Langston Road
Loughton
Essex
IG10 3SD |
| 2. | Name of the Engineer | Campbell Reith Hill LLP |
| | Address: | Friars Bridge Court
41-45 Blackfriars Road
London
SE1 8NZ |
| 3. | Defects Correction Period | |
| 4. | Number and type of copies of Drawings to be provided | <u>Figures</u>
Figure 1: Site location plan
Figure 2: Existing site layout
Figures 3a and 3b: Proposed development plans
Figure 4: Exploratory Hole location plan |
| 5. | Form of Agreement | Not Required |
| | If required | |
| 6. | Performance Bond | Not required |
| | Amount of Bond (if required) to be | 10% of Tender Total |
| 7. | Minimum amount of third party insurance (persons and property) for each and every occurrence | £5,000,000 |
| 8. | The liability of the Contractor under his Professional Indemnity shall be | £2,000,000 |
| 9. | Commencement Date (Date of instruction) | (Week 0) |
| 10. | Time for completion calculated from the Commencement Date | |
| | Sections of the Investigation | |
| | Section | |
| | A - Completion of site works. | Week 4 |
| | B - Release of preliminary information (draft report) in accordance with Specification Schedule S1.21.12 | Week 6 |

C - The Remainder of the Investigation (Final Report) Week 7

11. Liquidated damages for delay

per week limit of liability

Section

Completion of site works.

Release of preliminary information in accordance with Specification Schedule S1.8.21.

The Remainder of the investigation

12. Method of measurement adopted in preparation of Bills of Quantities

"Site Investigation in Construction, UK Specification for Ground Investigation, 2nd Edition (2012)"

13. Rate of retention (recommended not to exceed 5%)

0%

14. Limit of retention (% of Tender Total)
(Recommended not to exceed 3%)

0%

15. Bank whose Base Lending Rate is to be used

Bank of England

16. Name of the Principal Designer
Address:

Kier Construction London (TBC)

17. Period for Approval

Testing Schedule: 1 week
Draft Report: 1 week
Final Report: 1 week

18. Maximum sum for the Contractor to make changes without an instruction

£100

19. The arbitration procedure to be used is

a) The Institution of Civil Engineers' Arbitration Procedure (1997)

FORM OF AGREEMENT

THIS AGREEMENT made the _____ day of _____ 20 .

BETWEEN

of

in the County of _____ (hereinafter called "the Employer")

and

of

in the County of _____ (hereinafter called "the Contractor")

WHEREAS the Employer is desirous that certain Investigations should be carried out in connection with

and has accepted a Tender by the Contractor for the carrying out of the Investigation.

NOW THIS AGREEMENT WITNESSETH as follows

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, namely
 - a) the said Tender and the written acceptance thereof
 - b) the Drawings
 - c) the Conditions of Contract
 - d) Schedules 1 to 8
 - e) the Specification
 - f) the priced Bill of Quantities
 - g) the Form of Warranty
3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned the Contractor hereby covenants with the Employer to carry out the Investigation in conformity in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay to the Contractor in consideration of the carrying out of the Investigation the Contract Price at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed the day and year first above written.

SIGNED on behalf of the said Ltd/plc (the Employer)

Signature

Signature

Position

Position

In the presence of

In the presence of

SIGNED on behalf of the said Ltd/plc (the Contractor)

Signature

Signature

Position

Position

In the presence of

In the presence of

or

SIGNED (and SEALED*) AS A DEED by the said

..... Ltd/plc (the Employer)

In the presence of

SIGNED (and SEALED*) AS A DEED by the said

..... Ltd/plc (the Contractor)

In the presence of

* Delete as appropriate

SCHEDULES 1 - 8

Specification

The Specification shall be the *UK Specification for ground investigation, 2nd Edition* published by ICE Publishing, with the information, amendments and additions as described in the Schedules.

- Schedule 1. Information and site-specific requirements
- Schedule 2. Exploratory holes
- Schedule 3. Investigation Supervisor's facilities
- Schedule 4. Specification amendments
- Schedule 5. Specification additions

Schedule 1: Information and site-specific requirements

S1.1 Name of Contract

The Greenwood Centre

S1.2 Investigation Supervisor

CampbellReith

S1.3 Description of Site

The site location is presented in Figure 1. The site is located at Greenwood Place, London, NW5, in the London Borough of Camden (NGR 528840E, 185400N), approximately 200m north-west of Kentish Town Station.

The site is bound to the north-west by Deane House, to the east by a road named Greenwood Place and to the west by Murphy's Yard.

The Greenwood Centre is composed of several connected structures forming a single one-storey complex which were historically a day centre and a hostel. Headroom in the northern section of the site is restricted by a low height ceiling of circa 2.7m. If ceiling tiles are removed this can be increased to 3.1m.

S1.4 Main works proposed and purpose of this contract

The proposed site redevelopment is shown in Figure 3a. It is proposed to demolish the existing buildings and construct a new community centre with a single storey basement beneath the north west part of the building. Available plans indicate the finished floor level for most of the basement to be around 32.70m OD. Locally a pool and associated balance tank are to be constructed in the basement and these features are indicated to have a finished floor level the region of 31.43m OD.

S1.5 Scope of Investigation

The investigation should comprise the following:

- Full time supervision of the site works.
- Health and Safety Documentation in accordance with CDM 2015.
- 3 cable percussive boreholes to 15-25m.
- 4 Foundation inspection pits.
- 4 in-situ CBR tests by TRL probe.
- Geotechnical sampling and laboratory testing.
- Geo-environmental sampling and laboratory testing.
- Production of a Factual Report.

It should be noted that the investigation is proposed to be undertaken prior to demolition of existing buildings. Consequently it is noted that a de-mountable cable percussive rig will be required. Partial demolition of

structures can be arranged by the client if deemed required for health and safety purposes or deemed to provide an economical saving to the cost of the ground investigation. It should be noted that a suspended floor slab is suspected in the northern site section in the location of BH1 and potentially in the location of FIP1. The Contractor is to ensure that a floor slab risk assessment and mitigation measures are in place before setting up equipment. Liaison with the principal contractor (Kier) will be required and any enabling works should be agreed directly.

S1.6 Geology and Ground Conditions

The following general assessment of the geology of the site and ground conditions has been inferred from available information and historical site investigation. No assurance is given to its accuracy.

An area of 'Worked Ground' is shown on geological mapping on the western corner of the site, which would suggest it has a minimum thickness of 5m. It is also likely that Made Ground will be present overlying the London Clay in the remainder of the site, although this is likely to be of a lesser thickness than the 'Worked Ground' as it is not shown on geological mapping.

Strata	Depth to Base (m bgl)	Description
Made Ground / Worked Ground	Unknown	Man-made granular and cohesive soils of unknown thickness, associated with historical development of the site.
Alluvium	Unknown	A former tributary of the River Fleet is anticipated to be present beneath the site. It is therefore possible that Alluvial deposits may be present on site overlying the London Clay.
London Clay	50m bgl	Firm brown clay, becoming stiff to very stiff blue silty clay with depth.

S1.7 Schedule of Drawing(s) and Documents

Figures

Figure 1: Site location plan.

Figure 2: Existing site layout.

Figures 3a: Proposed development plan.

Figure 4: Exploratory Hole location plan.

Reports

AEDsrm-11167-300415-LQS-F3: CampbellReith Preliminary LQS.

Type II Asbestos Surveys.

S1.8 General requirements (Specification Section 3) Particular restrictions/relaxations

The Contractor should note there are amendments and additions to the Standard Clauses - refer to Schedules 4 and 5.

S1.8.1 Quality Management System (Clause 3.3)

Accreditation to BS EN ISO 9001 is required.

S1.8.2 Professional Attendance (Clause 3.5.2)

The Contractor shall provide suitably qualified personnel, with not less than 5 years relevant experience to supervise the works and undertake the tasks detailed in Specification.

The Contractor is to provide competent staff to undertake all site operations detailed in S1.5 and Schedule 2. The Contractor is to provide all names, contact numbers and relevant certification for all site personnel listed within this report.

All site staff provided by the Contractor will be required to hold a valid CSCS Card.

S1.8.3 Provision of ground practitioners and other personnel (Clauses 3.6.1 and 3.6.2)

S1.8.4 Hazardous ground, land affected by contamination and notifiable and invasive weeds (Clauses 3.7.1 and 3.22)

A Preliminary Land Quality Statement has been prepared for the site and the Contractor is required to appraise the matter in relation to the safe completion of site investigation works.

Type II asbestos surveys are available for the site. The Contractor should consider asbestos in soils or structures as a presumed risk. The Contractor shall review the information provided at tender stage and make provision for any additional assessments needed to appraise the associated risks in order to safely control the works.

S1.8.5 Additional information on services not shown on Contract drawings (Clause 3.7.2)

The Contractor should satisfy themselves that they have all necessary information in order to mitigate Health & Safety risk associated with underground services and utilities and if not, notify the Investigation Supervisor of what measures shall be required to do so.

The Contractor shall take full responsibility for the location, avoidance and protection of all underground and over ground services.

S1.8.6 Known suspected mine workings, mineral extractions, etc. (Clause 3.7.3)

S1.8.7 Protected species (Clause 3.7.4)

S1.8.8 Archaeological remains (Clause 3.7.5)

S1.8.9 Security of site (Clause 3.11)

The site is a disused building not accessible to the Public. Security guards are currently present at the site 24 hours a day.

S1.8.10 Traffic management measures (Clause 3.12)

S1.8.11 Restricted working hours (Clause 3.13)

Working site hours will be restricted to 08:00 to 18:00 hours Monday to Friday inclusive. This is subject to confirmation.

S1.8.12 Trainee site operatives (Clause 3.14.1)

Not permitted.

S1.8.13 Contamination avoidance and/or aquifer protection measures required (Clauses 3.15.2 and 3.15.3)

S1.8.14 Maximum period for boring, pitting or trenching through hard material, hard stratum or obstruction (Clauses 2.8, 4.3 and 6.4)

One hour upon which time the Investigation Supervisor is to be advised of progress.

S1.8.15 Reinstatement requirements (Clause 3.16)

Backfilling of boreholes with bentonite is required where no installation is present.

S1.8.16 Hygiene facilities required (Clauses 2.20 and 3.16.1)

The contractor may use welfare facilities within the existing building, this is to be confirmed.

S1.8.17 Unavoidable damage to be reinstated by Contractor (Clause 3.16.1)**S1.8.18 Accuracy of exploratory hole locations (Clauses 3.19 and 3.20)**

The as built positions of all exploratory holes shall be related to the National Grid system to an accuracy of 0.50m.

The elevation of the ground at each exploratory hole shall be related to Ordnance Datum to the nearest 0.05m.

S1.8.19 Photography requirements (Clause 3.25)

Photographs are required. Photographs shall be supplied within the digital copy of the report.

S1.8.20 Approvals**S1.8.21 Meetings**

An Engineer from CampbellReith may meet the contractor on site during works. This is subject to confirmation.

Due to access restrictions it is recommended that the contractor visits site prior to mobilising site equipment. Tender visits are outlined in Item 13 of the Site Investigation Contract.

S1.9 Percussion boring (Specification Section 4) Particular restrictions/relaxations**S1.9.1 Permitted methods and restrictions (Clauses 4.1 to 4.4)**

Due to access restrictions it is anticipated that a de-mountable cable percussive rig will be the most appropriate method of borehole construction. Cable percussive boreholes shall take into account the restricted head room at site.

Some locations will be undertaken on a suspended floor slab. This floor slab is of concrete construction and suspected to be raised above ground level by 0.60 - 1.0m (variable). The Contractor is to ensure that a floor slab risk assessment and mitigation measures are in place before setting up equipment.

It should be noted that ventilation equipment may be required.

S1.9.2 Backfilling (Clause 4.5)

Exploratory holes shall backfilled with bentonite or lean mix concrete where installs are not required.

All working areas shall be returned to their original condition and the reinstatement is to be such that the risk of subsequent trip hazard forming is avoided.

S1.9.3 Dynamic sampling (Clause 4.6)

Dynamic sampling is to comprise windowless sampling undertaken using a track mounted rig capable of undertaking SPTs. SPTs shall be taken at 1.0m intervals.

S1.10 Rotary drilling (Specification Section 5) Particular restrictions/relaxations

Not required.

S1.11 Pitting and trenching (Specification Section 6) Particular restrictions/relaxations

It should be noted that historical concrete slabs may be present within borehole positions. The contractor shall provide breaking apparatus to penetrate concrete slabs to enable borehole and foundation inspection pit construction, if deemed safe to do so. The Contractor is to ensure that a floor slab risk assessment and mitigation measures are in place before setting up equipment.

S1.11.1 Detection of buried services and inspection pits (Clauses 3.8.3 and 6.1)

The Contractor shall complete a specialist service scan of each proposed exploratory location to confirm it is free of detectable services. Where a service is detected or suspected in the vicinity of the location the proposed exploratory location this shall be relocated a safe distance from the service.

Where services are suspected, known or found to be in close proximity to the proposed exploratory hole, the Investigation Supervisor should relocate the hole to be clear of the services. The revised location should take into account statutory/required safe distances from services. If the location of the exploratory hole cannot be moved, further inspection pits are to be excavated to confirm the services location and ensure that they will be unaffected by the investigation. This may need the approval of the utility company.

The use of inspection pits should, wherever possible, prove the positive presence of services rather than their absence. In some cases, inspection pits may need to be excavated beyond 1.20m bgl in order to be appropriate. This may include areas where land has been raised since services installation or to locate services at greater depth (e.g. foul sewer and high-voltage electricity cables). As a general reference, please consult and adhere to:

Health & Safety Executive (HSE) Publication 47, Avoiding Danger from Underground Services, 2005.

S1.11.2 Restrictions on plant or pitting/trenching methods (Clauses 6.2 and 6.3)**S1.11.3 Entry of personnel (Clause 6.5)****S1.11.4 Alternative pit and trench dimensions (Clause 6.7)****S1.11.5 Abstracted groundwater from land affected by contamination (Clause 6.9.2)****S1.11.6 Backfilling (Clause 6.10)****S1.11.7 Photographic requirements (Clause 6.12)**

Photographs are required of all positions within the Factual Report - sufficient photographs to show the condition of the site prior to the start of the works and upon completion must be taken. All starter pit locations and any services, obstructions and foundations are to be photographed as per good practice described in BS EN ISO 5930:A2 2015.

S1.11.8 Artificial lighting (Clause 6.12.2)

Artificial lighting shall be provided as required to obtain suitable photographs.

S1.11.9 Provision of pitting equipment and crew for Investigation Supervisor's use (Clause 6.13)**S1.11.10 Foundation Inspection Pits**

Foundation inspection pits shall reveal the full depth, width and geometry of the foundation and shall allow sampling and description of the bearing stratum. Such excavations shall have a minimum base area of 1.5m².

The depth (related to Ordnance Datum), width and any stepping of the foundation shall be recorded with a description of the construction materials. Records shall include cross sections and sketches of excavation faces. Photographs are required. Foundation inspection pits are not to be backfilled until they have been inspected by an engineer from CampbellReith.

S1.12 Sampling and monitoring during intrusive investigation (Specification Section 7) Particular restrictions/relaxations

S1.12.1 Address for delivery of selected geotechnical samples (Clause 7.6.1)

This clause also refers to samples taken for contamination testing.

S1.12.2 Retention and disposal of geotechnical samples (Clause 7.6.2)

This clause also refers to samples taken for contamination testing.

S1.12.3 Frequency of sampling for geotechnical purposes (Clause 7.6.3 - 7.6.11)

- The minimum frequency of sampling is described in Cl 7.6.4. The frequency of sampling and in situ testing is dependent on the ground conditions and shall be such that each and every soil stratum including all near surface strata, is sampled, defined and identified. It is to be ensured that samples are typical of the zone from which they have been taken. Sampling is to be sufficient to permit the determination of desiccation in the upper 4m and to allow the design, where required, of working platforms.
- In addition to the frequency stipulated in Cl 7.6.4, bulk disturbed samples shall be taken over the depth of SPTs in granular soils and fill.
- In cohesive soils open tube samples and SPTs are to be alternated at the frequency described above, unless noted otherwise in Schedule 2.
- In pits, trenches and dynamic sampler holes window/windowless samples holes small disturbed samples shall be taken of the topsoil, at each change in soil type or consistency and between successive bulk disturbed samples. Where achievable, bulk samples shall be taken at 1m intervals with at least one large bulk disturbed samples of each soil type.

S1.12.4 Open-tube and piston sample diameters (Clause 7.6.5)

UT100 samples are required at a spacing based on S1.12.3. However, subject to the agreement with the Investigation Supervisor, it may be permissible to adopt U100 sampling on the following basis for a given exploratory hole:

1. In the event of a UT100 refusing or failing, the hole is to be cleaned out and a U100 undertaken and a UT100 attempted at the next scheduled depth for an open tube sample based on S1.12.3 above.
2. If undertaking item 1 above results in two successive failures or refusals to UT100 sampling, the hole is to be cleaned out and a U100 undertaken. From then on U100 samples are to be undertaken for the remainder of the hole at the scheduled depths for open tube samples based on S1.12.3 above.

Refusal or failure UT100 sampling is defined as (i) damage to the cutting shoe which is considered by the supervising geotechnical engineer to result in sample disturbance (ii) the failure to recover a sample of sufficient length to facilitate the testing of a 100mm diameter sample for undrained shear strength in triaxial apparatus or (iii) recovery of a sample which is considered, by the supervising engineer, to be disturbed.

S1.12.5 Retention of cutting shoe samples (Clause 7.6.5)

S1.12.6 Delft and Mostap sampling (Clause 7.6.12)

S1.12.7 Groundwater level measurements during exploratory hole construction (Clause 7.7)

Strikes and rises in groundwater to be noted during exploratory hole construction on corresponding exploratory hole log.

S1.12.8 Special geotechnical sampling (Clause 7.8)**S1.12.9 Address for delivery of selected samples (Clause 7.9.2)****S1.12.10 Retention and disposal of contamination/WAC samples (Clause 7.9.3)****S1.12.11 Frequency of sampling for contamination testing (Clause 7.9.4)**

- Soil samples shall be recovered from each exploratory hole at a minimum as follows:
 - 0 - 0.15m in topsoil or surface layer;
 - At 0.25m into each soil layer beneath. This depth is to be revised to a central position when the soil layer is less than 0.40m deep; and,
 - In Made Ground at minimum 1.00m intervals.
- The extent of sampling shall ensure that samples are recovered for each soil type, including undisturbed soils, Made Ground, and any horizon exhibiting visual or olfactory signs of contamination. Particular care shall be taken to ensure that each different type of Made Ground are sampled.
- Where suspected Asbestos Containing Materials (ACM) are encountered within the soils, an additional sample of the bulk ACM shall be collected together with a soil sample from the corresponding position. Where ACM is to be sampled, this should be undertaken under appropriate risk assessed methodologies utilising PPE, RPE and any other mitigation as deemed necessary by the Contractor or their specialist sub-consultants. Samples should be – as a minimum – double bagged and labelled 'May Contain Asbestos' and delivered by an appropriately licenced courier to a specialist laboratory.

S1.12.12 Sampling method (Clause 7.9.5)

Where insufficient sample volumes are available to provide the soil samples described under S1.12.11, the Contractor shall notify the Engineer and request alternative instructions.

S1.12.13 Headspace testing (Clause 7.9.8)**S1.12.14 Sample Containers and Deviating Samples (Clause 7.9.6)**

The Contractor shall ensure that the sample container, preservation, storage/holding and transit arrangements are sufficient to prevent any sample for contamination becoming a 'deviating sample' (Refer to UKAS "Guidance on Deviating Samples").

In advance of works the Contractor shall be required to confirm with the laboratory the specific arrangements for site based filtration of water and preservation of the sample in light of the range of determinants proposed by the Consultant for works and shall be required to provide sufficient sample containers for this purpose. The Contractor shall then comply with these requirements in full.

The Contractor shall notify the Consultant if any expedited sample scheduling is required to prevent the holding time of any determinant proposed by the Consultant at tender stage being exceeded.

As a minimum all environmental soil samples shall comprise an 825 ml plastic tub, 250 ml glass jar (wide neck) and 2 no. 60 ml glass jar (clear vial with PTFE seal). Additional samples shall be obtained where required to comply with the laboratory.

As a minimum all environmental water samples shall comprise an 100 ml plastic bottle, 40 ml vial, 500 ml plastic bottle and 1000ml glass bottle (dark). Additional samples shall be obtained where required to comply with the laboratory.

S1.13 Probing and cone penetration testing (Specification Section 8) Particular restrictions/relaxations

Not required.

S1.14 Geophysical testing (Specification Section 9) Particular restrictions/relaxations

Not required.

S1.15 In situ testing (Specification Section 10) Particular restrictions/relaxations**S1.15.1 Tests in accordance with British Standards (Clause 10.3)**

At CBR locations the test is to be carried out using a TRL probe and is to commence below any existing hard standing or 300mm bgl (whichever is deeper) and is to extend to 1.00m bgl. Where specified in Schedule 2, a hand dug pit is to extend over the tested zone and materials are to be sampled and logged as described in S1.12.3.

S1.15.2 Hand penetrometer and hand vane for shear strength (Clause 10.4.1)

Hand shear vane and/or hand penetrometer testing is required in situ or on block samples in all cohesive strata to 2m depth.

S1.15.3 Self-boring pressuremeter and high-pressure dilatometer testing and reporting (Clause 10.5.1)**S1.15.4 Driven or push-in pressuremeter testing and reporting requirements (Clause 10.5.2)****S1.15.5 Menard pressuremeter tests (Clause 10.5.3)****S1.15.6 Soil infiltration test (Clause 10.6)****S1.15.7 Special in situ testing and reporting requirements (Clause 10.7)****S1.15.8 Interface probes (Clause 10.8)****S1.15.9 Contamination screening tests (Clause 10.9)****S1.15.10 Metal detection (Clause 10.10)**

The CampbellReith preliminary LQS report has stated that the risk of encountering UXOs is considered to be **Low**.

Notwithstanding the above information, UXO hazards should be included as part of the health and safety briefing and tool box talks during the works, such that if any suspicious articles are found, they can be quickly identified and treated appropriately by specialist inspection.

S1.16 Instrumentation (Specification Section 11) Particular restrictions/relaxations**S1.16.1 Protective covers for installations (Clause 11.2)**

Flush cover and rubber bung to be used unless noted otherwise in Schedule 2.

S1.16.2 Protective fencing (Clause 11.3)**S1.16.3 Standpipe and standpipe piezometer installations (Clauses 11.4.1 and 11.4.2)****S1.16.4 Other piezometer installations (Clause 11.4.3)****S1.16.5 Development of standpipes and standpipe piezometers (Clause 11.4.5)**

Well development is required to ensure the well is suitable for subsequent sampling and for in situ permeability tests. It is required to settle down the filter pack, break down any remoulded soil on the BH wall

surface formed during installation. Reference should be made to BS ISO 14686 (2003) for appropriate methods depending on strata.

S1.16.6 Ground gas standpipes (Clause 11.5)

Ground gas monitoring standpipes are to be incorporated into standpipes as per described in S1.16.3. Construction details are provided within Schedule 2.

S1.16.7 Inclinator installations (Clause 11.6)

S1.16.8 Slip indicators (Clause 11.7)

S1.16.9 Extensometers and settlement gauges (Clause 11.8)

S1.16.10 Settlement monuments (Clause 11.9)

S1.16.11 Removal of installations (Clause 11.10)

S1.16.12 Other instrumentation (Clause 11.11)

S1.17 Installation monitoring and sampling (Specification Section 12) Particular restrictions/relaxations

S1.17.1 Groundwater level readings in installations (Clause 12.2)

The Contractor should note there are amendments to the Clause to which this Schedule relates - refer to Schedule 4.

S1.17.2 Groundwater sampling from installations (Clause 12.3.1)

The Contractor shall obtain post fieldwork water samples from installations during monitoring. (3 no.) return visits shall be made to site for monitoring. Refer also to S1.17.7.

S1.17.3 Purging/micro-purging (Clause 12.3.2)

Purging of all installations where groundwater sampling is required to continue until conductivity, pH, temperature, dissolved oxygen and redox potential have stabilised.

S1.17.4 Ground gas monitoring (Clause 12.4)

The Contractor should note there are amendments to the Clause to which this Schedule relates - refer to Schedule 4.

The Contractor monitor post fieldwork installations. (3 no.) return visits shall be made to site for monitoring. Samples containers shall be compliant with S1.17.7.

S1.17.5 Sampling from ground gas installations (Clause 12.5)

If concentrations of CH₄ exceed 1.0% vol., concentrations of CO₂ exceed 5.0% vol, concentrations of Volatile Organic Compounds (VOCs) exceed 20ppm or concentrations of oxygen are less than 10% vol, collect gas samples using either tedlar bags, or negative pressure gas canisters.

S1.17.6 Other monitoring (Clause 12.8)

S1.17.7 Sampling and testing of surface water bodies (Clause 12.9)

S1.18 Daily records (Specification Section 13) Particular restrictions/relaxations

S1.18.1 Information for daily records (Clause 13.1)

The Contractor should submit a copy of the previous days works in the form of a printed sheet or Driller's log no later than noon the following day.

S1.18.2 Special in situ tests and instrumentation records (Clause 13.4)**S1.19 Geotechnical laboratory testing (Specification Section 14) Particular restrictions/relaxations****S1.19.1 Investigation Supervisor or Contractor to schedule testing (Clause 14.1.1)**

Investigation Supervisor to schedule geotechnical, contamination and waste testing.

S1.19.2 Tests required (Clause 14.1.2)

- Refer to Section K of the Bill of Quantities.
- The Contractor shall inform the Investigation Supervisor at tender stage if testing procedures are to vary from those specified.

S1.19.3 Specifications for tests not covered by BS 1377 and options under BS 1377 (Clauses 14.2.1 and 14.4)**S1.19.4 UKAS accreditation to be adopted (Clause 14.3)**

UKAS accreditation is required for all geotechnical tests.

S1.19.5 Rock testing requirements (Clause 14.5)**S1.19.6 Chemical testing for aggressive ground/groundwater for concrete (Clause 14.6) (Test Suites A-D are overleaf)**

- The quantity of anticipated testing is given in the Bill of Quantities.
- The test methods must comply with Suite B/D.

S1.19.7 Laboratory testing on site (Clause 14.7)**S1.19.8 Special laboratory testing (Clause 14.8)**

SCHEDULE 1.19.6 (Derived from BRE Special Digest SD1)

CHEMICAL TESTS ON POTENTIALLY AGGRESSIVE GROUND/GROUNDWATER

SUITE B Greenfield site (pyrite present)			
Sample type	Determinand	Recommended test methods	Test method specified
Soil	pH in 2.5:1 water/soil extract	BR 279 Electrometric	Any of the recommended
		BS 1377 Part 3, Method 9	
	SO ₄ in 2:1 water/soil extract	BR 279 Gravimetric method, cation exchange or ion chromatography	
		BS 1377 Part 3 Method 5.3 + 5.5	
		TRL: 447 Test 1	
	Acid soluble SO ₄	BR 279 Gravimetric method	
		BS 1377 Part 3, Method 5.2 + 5.5	
		TRL 447 Test 2	
	Total sulphur	BR 279 Ignition in oxygen	
		TRL 447 Test 4A	
TRL 447 Test 4B			
Groundwater	pH	BR 279 Electrometric	
		BS 1377 Part 3, Method 9	
	SO ₄	BR 279 Gravimetric method, cation exchange or ion chromatography	
		BS 1377 Part 3 Method 5.4 + 5.5	
		Commercial lab in-house procedure – determination of sulphur by ICP-AES ¹	

¹ ICP-AES: inductively coupled plasma atomic emission spectroscopy.

SCHEDULE 1.19.6 (Derived from BRE Special Digest SD1) continued**CHEMICAL TESTS ON POTENTIALLY AGGRESSIVE GROUND/GROUNDWATER**

SUITE D Brownfield site (pyrite present)			
Sample type	Determinand	Recommended test methods	Test method specified
Soil	pH in 2.5:1 water/soil extract	BR 279 Electrometric	Any of the recommended
		BS 1377 Part 3, Method 9	
	SO ₄ in 2:1 water/soil extract	BR 279 Gravimetric method, cation exchange or ion chromatography	
		BS 1377 Part 3 Method 5.3 + 5.5	
		TRL: 447 Test 1	
	Acid soluble SO ₄	BR 279 Gravimetric method	
		BS 1377 Part 3, Method 5.2 + 5.5	
		TRL 447 Test 2	
	Total sulphur	BR 279 Ignition in oxygen	
		TRL 447 Test 4A	
TRL 447 test 4B			
Mg (only required if water soluble SO ₄ > 3000 mg/l)	BR 279 AAS ¹ method		
	Commercial lab in-house procedure – variant of BR 279 using ISP-AES ²		
NO ₃ in 2:1 water/soil extract (only required if pH < 5.5)	BR 279		
C1 in 2:1 water/soil extract (only required if pH < 5.5)	BR 279		
	BS 1377 Part 3, Method 7.2		
Groundwater	pH	BR 279 Electrometric	
		BS 1377 Part 3, Method 9	
	SO ₄	BR 279 Gravimetric method, cation exchange or ion chromatography	
		BS 1377 Part 3 Method 5.4 + 5.5	
		Commercial lab in-house procedure – determination of sulphur by ICP-AES ²	
	Mg (only required if water soluble SO ₄ ≥ 3000 mg/l)	BR 279 AAS method ¹	
		Commercial lab in-house procedure – Mg in solution by ICP-AES ²	
	NO ₃ (only required if pH < 5.5)	BR 279	
C1 (only required if pH < 5.5)	BR 279		
	BS 1377 Part 3, Method 7.2		

¹ AAS: atomic absorption spectrometry.² ICP-AES: inductively coupled plasma atomic emission spectroscopy.

S1.20 Geoenvironmental laboratory testing (Specification Section 15) Particular restrictions/relaxations

S1.20.1 Investigation Supervisor or Contractor to schedule testing (Clause 15.1)

Investigation Supervisor to schedule all testing.

S1.20.2 Accreditation Required (Clause 15.2)

The Contractor should note CampbellReith have made an amendment to the Clause to which this Schedule relates. The Contractor should refer to Schedule 4 for these requirements.

The Contractor shall notify the Investigation Supervisor where any accreditation cannot be achieved or when any sample deviates prior to reporting (refer to UKAS 'Guidance on Deviating Samples').

S1.20.3 Chemical testing for contamination (Clause 15.3)

The chemical analytical laboratory shall be Specific. The Contractor shall refer to following tables indicating the contamination test suites for soil, water and gas which may be required as part of the works. All analytical tests are required on a 10 day turnaround.

The Contractor shall notify the Investigation Supervisor where any Limit of Detection (LOD) cannot be achieved. The Contractor shall state in his tender return where any test method inserted in Schedule 1.20.3 cannot be achieved.

pH tests on soils and groundwater and sulphate tests on groundwater are to comply with methods prescribed S1.19.6

SCHEDULE 1.20.3

PRIMARY SOIL ANALYSIS SUITES (CONTRACTOR TO COMPLETE METHOD AND LAB)

		LOD
s1.1	As, Cd, Cr, Cu, Ni, Pb, Hg, Se, Zn	1mg/kg
	Cyanide (total)	1mg/kg
	pH	Unit 0.1%
	TPH screen (C6-C40)	10mg/kg
	PAH (16 speciated)	0.01mg/kg
	Phenol (total)	0.01mg/kg

		LOD
s1.2	Phenol (total)	0.01mg/kg
s1.3	Asbestos in Soil using stereo microscopy	Detected
s1.4	Total Organic Carbon	%
s1.5	Sulphate (total)	50 mg/kg

		LOD
s1.6	As, Cd, Cr, Ni, Pb, Hg, Se, Cu, Zn,	1mg/kg
	Moisture Content	0.1 %
	PAHs USEPA 16	0.01mg/kg
	EPH Banded (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, >C21)	0.01mg/kg
	Sulphate (total)	50 mg/kg
	Sulphide	15 mg/kg
	Phenols Monohydric (Total of Phenol+Cresol+Xylenol)	0.025mg/kg
	Cyanide (total)	1mg/kg
	pH	pH

		LOD
s1.7	TPH – CWG (C5-40) Aliphatic/Aromatic Split (with CWG banding) Ali C5-6,>6-8,>8-10,>10-12,>12-16,>16-35,>35-44 Aro - >C6-7,>7-8,>8-10,>C10-12,>12-16,>16-21,>21-35, >35-44	0.1mg/kg

		LOD	Method / Lab
s1.8	(As S1.3 above) Asbestos in Soil using stereo microscopy	Detected	Asbestos in Soil using stereo microscopy
s1.9	Identification of Asbestos in a Bulk material by PLM (e.g. identification of asbestos in a product such as a cement).	Present / Absent	HSG 248
s1.10	Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM	0.1%	HSG 248/HSG 264
s1.11	Detailed Gravimetric Quantification and Free Fibre Dispersion and Collection by PLM/COM	0.001%	HSG 248/HSG 264/HSE Report NO. 83/19964

		LOD
s1.12	Soil Leachate Preparation (specific determinants specified as water)	NA
s1.13	Fraction Organic Carbon (for NC/99/11)	Fraction

OTHER SOIL ANALYSIS

	LOD
<u>CLEA Metals (specify after CLR 8)</u>	
Barium	1mg/kg
Beryllium	1mg/kg
Vanadium	1mg/kg
Water Soluble Boron	1mg/kg
Hexavalent Chromium	0.3mg/kg
Zinc	1mg/kg
<u>CLEA Inorganic Chemicals (specify after CLR 8)</u>	
Cyanide (Free)	1mg/kg
Nitrate (soluble) as NO ₃	1mg/kg
Nitrite (soluble) as NO ₂	0.01 mg/kg
Water Soluble Sulphate as SO ₄ 2:1 Extract	0.003g/l
Sulphate (Total)	50mg/kg
<u>Non CLEA Inorganic Chemicals</u>	
Ammoniacal Nitrogen – as N	0.3mg/kg
Fluoride	0.25mg/kg
Nitrite	0.3mg/kg
Phosphate	1mg/kg
Sulphur (Elemental)	50mg/kg
Sulphur (Total)	0.01%
Thiocyanate	1mg/kg
<u>Non CLEA Miscellaneous</u>	
Leachate Prep – TCLP	NA
Loss on ignition	0.10%
Calorific Value	MJ/kg
<u>CLEA Organic chemicals</u>	
PAH (16 speciated) (Modified EPA 8100)	0.001mg/kg
Benzo(K)fluoranthene	0.001mg/kg
TPH – Risk Based Evaluation Package (C6-C40)	10mg/kg
TPH – CWG (C5-35)	0.1mg/kg
TPH – UK CWG (EC5 – EC70) for EA report P5-08/TR3	0.1mg/kg
BTEX by GC-MS (0.001mg/kg
Phenols (speciated)	10mg/kg
TLC (mineral oils, aromatics, NSO resins)	10mg/kg
PCBs (7 congeners)	0.001mg/kg
PCBs (total aroclors)	0.001mg/kg
Acetone	0.001mg/kg
<u>CLEA Semi Volatile Organic Compounds (SVOCs)</u>	
SVOCs target list (Modified US EPA 8270)	0.1mg/kg
SVOC scan (up to 10 peaks, >80% fit)	1mg/kg
<u>CLEA Volatile Organic Compounds (VOCs)</u>	
VOCs target list only (Modified US EPA 8260)	0.1mg/kg
<u>CLEA Organics</u>	
Glycol Suite: Monoethylene glycol, propylene glycol, diethylene glycol, triethyleneglycol	0.1mg/kg
Alcohol suite: methanol, ethanol, i-propanol, methyl acetate, n-propanol, ethyl acetate, i-propyl acetate, n-butanol, n-propyl acetate, n-oentanol, n-butyl acetate, n-hexanol, n-heptanol (both 1mg/kg)	0.1mg/kg
Pesticides – Combined suite	0.001mg/kg
Pesticides – Organochlorine suite	0.001mg/kg
Pesticides – Organophosphorous suite	0.001mg/kg
Total Organic Carbon (TOC)	0.01%

	Atrazine and simazine	0.01mg/kg
	Dioxins and furans	0.001mg/kg
	Organolead compounds	0.01mg/kg
	Organotin compounds	0.01mg/kg

DC - Distillation/colourmetric. IC - Ion Chromatography

PRIMARY WATER ANALYSIS SUITES (CONTRACTOR TO COMPLETE METHOD AND LAB)

		LOD
w1.1	As, Cd, Cr, Cu, Ni, Zn, Pb, Hg, B, Se, hex Cr	0.001mg/l
	Total cyanide, free cyanide, thiocyanate	1.0ug/l
	PAH (total), TPH (total), phenol (total)	0.1ug/l
	Sol sulphate, sulphide, free sulphur	0.1mg/l
	pH	0.01 units

		LOD
w1.2	PAH (total)	1mg/l
w1.3	PAH (total of USEPA 16)	0.01mg/l
w1.4	PAH (16 speciated) (Modified EPA 8100)	0.01ug/l
w1.5	TPH – CWG (C5-35) based on TNRCC method 1006	0.01mg/l
w1.6	Petrol Range Organics/BTEX/MTBE	0.01mg/l
w1.7	BTEX by GC-MS (Modified US EPA 8150)	0.001mg/l
w1.8	SVOCs target list (one extraction only) (Modified US EPA 8270)	0.001mg/l
w1.9	SVOC scan (up to 10 peaks, >80% fit)	0.01mg/l
w1.10	VOCs target list only (Modified US EPA 8260)	0.001mg/l
w1.11	VOCs target list plus TICs (top 10 peaks to 0.01mg/l only) (Modified US EPA 8260)	0.001mg/l
w1.12	Phenols (total) by HPLC	0.01mg/l
w1.13	Phenols (speciated)	0.01mg/l

OTHER WATER ANALYSIS

		LOD
	<u>Glycol Suite:</u>	
	Monoethylene glycol, propylene glycol, diethylene glycol, triethylene glycol	1mg/l
	<u>Alcohol suite</u>	
	Methanol, ethanol, i-propanol, methyl acetate, n-propanol, ethyl acetate, i-propyl acetate, n-butanol, n-propyl acetate, n-pentanol, n-butyle acetate, n-hexanol, n-heptanol.	1mg/l
	PCBs (7 congeners)	0.01µg/l
	PCBs (total aroclors)	0.001mg/l
	Pesticides - Combined suite	0.01µg/l
	Pesticides - Organochlorine suite	0.01µg/l
	Pesticides - Organophosphorous suite	0.01µg/l
	Total Organic Carbon (TOC)	1mg/l
	Tributyl-tin/triphenyl-tin/dibutyl tin	0.05ug/l
	Atrazine and simazine	0.01mg
	<u>Inorganics</u>	
	Ammoniacal Nitrogen	0.2mg/l
	BOD	1mg/l
	COD	10mg/l
	Chloride	1mg/l
	Complex Cyanide	0.05 mg/l

	Easily Lib Cyanide	0.05 mg/l
	Dissolved Oxygen	0.1mg/l
	Electrical Conductivity	0.01 mS/cm
	Nitrate	0.3mg/l
	Nitrite	0.05mg/l
	pH	0.01 units
	Sulphide	0.05mg/l
	Magnesium	0.001mg

PRIMARY GAS ANALYSIS SUITES (CONTRACTOR TO COMPLETE METHOD AND LAB)

		LOD
g1.1	Bulk Gas - Methane (0.05%), Carbon Dioxide (0.05%), Oxygen (0.5%), Nitrogen (0.5%), Hydrogen (0.5%), Carbon Monoxide (1ppm), Hydrogen Sulphide (1ppm)	0.05%
g1.2	C1-C7 (Methane, Ethane, Ethene, Butane, Propane, Pentane, Hexane, Heptane)	1ppm
g1.3	VOCs inc BTEX.	10ppm

S1.20.4 Waste characterisation (Clause 15.4)

The Contractor should note an addition to Clause 3.26 - refer to Schedule 5.

The Contractor shall be responsible for the disposal and waste classification of soils from the site investigation in line with Environment Agency requirements and shall make appropriate provision for this at tender stage.

S1.20.5 Waste Acceptance Criteria testing (Clause 15.5) (Test Suites H - J are overleaf)

All analytical tests for waste are required on a 10 day turnaround. The Contractor shall notify the Investigation Supervisor where any Limit of Detection (LOD) cannot be achieved.

WAC Leachate	LOD (mg/kg)
Eluates for compliance using BS EN 12457 - 3 at L/S 10/kg (2 batch)	
As	0.5
Ba	20
Cd	0.04
Cr	0.5
Cu	2
Hg	0.01
Mo	0.5
Ni	0.4
Pb	0.5
Sb	0.06
Se	0.1
Zn	4
Cl	800
F	10
SO ₄	1000 ¹
Total dissolved Solids (TDS) ²	4000
Phenol Index	1
Dissolved organic Carbon at own pH or pH7.5-8.0 ³	500

- ¹ This limit value for sulphate may be increased by 6,000, provided that the value of Co from a percolation test does not exceed 1,500 mg/l at L/S=0.1 l/kg. It will be necessary to use a percolation test to determine the limit value at L/S – 0.1 l/k.
- ² The values for TDS can be used instead of the values for Cl and SO4.
- ³ DOC at pH 7.5-8.0 and L/S 10 can be determined on eluate derived from a modified version of the pH dependence test, prEN 14429, if the limit value at own pH (BS EN 12457 eluate) is not met.

		LOD
Full WAC Soil Suite	TOC, LOI, BTEX, PCBs, Mineral Oil C10-C40 Acid Neutralisation Capacity, PAHs-total (17 GC-MS)	1% or mg/kg
Inert WAC Soil Suite	TOC, BTEX, PCBs, Mineral Oil C10-C40, PAHs-total (17 GC-MS) 1% or mg/kg	1% or mg/kg
Hazardous WAC Soil Suite	TOC, LOI	1%

S1.20.6 Laboratory testing (Clause 15.6)

S1.20.7 Special laboratory testing (Clause 15.7)

S1.21 Reporting (Specification Section 16) Particular restrictions/relaxations

S1.21.1 Form of exploratory hole logs (Clauses 16.1 and 16.2.1)

Preliminary logs, Chain of Custody forms and blank test schedules shall be submitted to the Investigation Supervisor within 48hrs of exploratory hole completion.

S1.21.2 Information on exploratory hole logs (Clause 16.2.2)

- As required by Cl16.2.2 and additionally:
 - (i) The results of any in situ tests associated with the location.
 - (ii) Any visual or olfactory evidence of contamination and reference to/detail of any suspected asbestos containing materials (matrix and proportion).
 - (iii) In all granular soils (including Made Ground) the state of density shall be classified in accordance with BS EN ISO 14688-2.
 - (iv) In addition to natural fine soils, the consistency term shall be given for any Made Ground that would behave as a fine soil.
 - (v) For trial pits the ease/difficulty of excavation shall be recorded.
 - (vi) For cores or excavations into rock the FI shall be recorded.
 - (vii) The % recovery is to be recorded for dynamic sampling techniques.

S1.21.3 Variations to final digital data supply requirements (Clause 16.5.1)

AGS data is required in full incorporating both the main phase of fieldwork and all subsequent gas and water monitoring visits and iterative phases of chemical analysis. The data shall be checked by the Contractor prior to issue and be accompanied by the error log.

S1.21.4 Preliminary digital data (Clause 16.5.3)

Preliminary AGS digital data is to be issued as part of the draft report as follows:

Exploratory Hole records and laboratory soils data (geotechnical, contamination and waste) upon completion of all scheduled testing and data from any completed monitoring. Files must include legend codes and all other relevant exploratory hole log data. Multiple files may be provided for gas and groundwater results provided they are uniquely identified.

S1.21.5 Type(s) of report required (Clause 16.6)

A factual site investigation report as described in Schedule S1.21.8 is required.

S1.21.6 Electronic report requirements (Clause 16.6.3)

- PDF versions of the report shall make use of bookmarks in accordance with the guidance notes to CI16.6.3.
- For draft and final reports, drawings are to be additionally provided in DWG or DXF formats and must include: north arrow, scale, a key and title indicating the subject of the drawings.
- Draft and final reports are to include AGS data as detailed in S1.21.3 and S1.21.4, although in the case of the latter updated to be consistent with the final report and to include the completed monitoring programme.
- In addition the draft and final reports are to include the following information in relation to contamination and waste testing:
 - i) 'CrossTab' collated Microsoft Excel electronic copy of results;
 - iii) Laboratory formatted data and MCERTS supporting data.
- Chemical analysis spread sheets shall be provided in:
 1. Excel spread sheet format that shall follow a consistent order and format for rows and columns to allow direct referencing across a given row/column for either a single determinant across all exploratory samples or vice versa.
 2. Separate sheets shall be provided for the analysis results for soil, water, leachate and gas.
 3. Each of the spread sheet fields shall be populated free of hidden data, spaces, or other insertions (other than explained symbols) that inhibit interpretation of data.
 4. The detection limit applicable to each chemical analysis, agreed at appointment, shall remain consistent throughout the works.
 5. The units of expression shall be consistent (e.g micrograms or milligrams) and shall remain consistent throughout the works for a given medium and parameter.
- Sample data shall be submitted to the Engineer electronically as soon as the complete data (eg. Schedule requested) becomes available and within 12 working days of receiving the applicable testing schedule from the Engineer

S1.21.7 Format and contents of Desk Study Report (Clause 16.7)

S1.21.8 Contents of Ground Investigation Report (or specified part thereof) (Clause 16.8)

- A factual report as described CI 16.8.1, CI16.8.2 and CI 16.8.3 is required, with the following additions:
 - CI 16.8.1 items (c) and (h): key sheets are to be additionally provided
 - CI 16.8.1 Item (c): Chain of Custody records are to be additionally provided for all contamination and waste samples.
 - CI 16.8.1 Item (d): Calibration certificates are to be additionally provided where calibration is required by the testing standard adopted.
- In addition the contractor is to provide a section of the report detailing any known limitations to the in situ, ex situ or monitoring test results provided.

S1.21.9 Contents of Geotechnical Design Report (or specified part therefore) Clause 16.9)

S1.21.11 Times for supply of electronic information (Clause 16.10.1)

- Preliminary AGS data is required as given in S1.21.4 and AGS data is required upon issue of the draft and final reports. Drawings to be additionally provided in DWG or DXF formats at the time of issue of draft and final reports.

S1.21.12 Electronic information transmission media (Clause 16.10.2)

- Preliminary data to be issued via e-mail.
- Draft and Final reports and associated data to be issued via e-mail and on CD or DVD ROM.

S1.21.12 Report approval (Clause 16.11)

- One electronic copy of the report is required for draft issue. This is the 'Preliminary Information' referred to in the Appendix to the Form of Tender.
- One electronic copy of the report is required for final issue. This must be a signed copy.
- The period of approval will be that given in the Appendix to the Form of Tender.

S1.21.13 Contents of an Interpretative Phase 2 Report for Contamination

Where specified in S1.21.5 the Contractor shall prepare a Phase 2 contamination interpretive report in accordance with DEFRA and the Environment Agency's 'Model Procedures for the Management of Land Contamination', CLR11 and BS 10175.

This shall include a risk assessment of land potentially affected by contamination, or ground stability and slope stability reports, incorporate a Conceptual Model, Generic Quantitative Risk Assessment, Recommendations (for further investigation and remediation) and Conclusions. The report should be adequate to satisfy any contamination related planning conditions based on the results obtained.

The Contractor shall review the prescribed scope of investigation at the tender stage and advise the Consultant if this requires modification in order to allow a comprehensive report to be prepared which satisfies these technical guidance documents.

Schedule 2: Exploratory Holes

S2.1 Hole number

S2.2 Type

S2.3 Scheduled depth

S2.4 National grid reference

S2.5 Approximate ground level

S2.6 Remarks

Hole number	Type	Scheduled depth (m)	Standpipe installation details	Sampling and in situ testing	Remarks
BH1	Cable Percussive Borehole	25	Ground water / gas installation depth to be confirmed by investigation supervisor during site works	As per in S1.12	SPTs, UT100s, geotechnical and geo-environmental samples
BH2		25			
BH3		15			
FIP1	Foundation Inspection Pit	To base of foundation as per S1.11.10	N/A	As per S.1.12	Hand shear vanes, geotechnical and geo-environmental samples.
FIP2					
FIP3					
FIP4					
CBR1	TRL probe	1.2	N/A	As per S1.12, S1.15.1 and S1.15.2	Hand dug pit required over depth of test to retrieve geotechnical and geo-environmental samples.
CBR2					
CBR3					
CBR4					

Schedule 3: Investigation Supervisor's Facilities

S3.1 Accommodation – not required

S3.2 Furnishings – not required

S3.3 Services – not required

S3.4 Equipment – not required

S3.5 Transport – not required

S3.6 Personal Protective Equipment for Investigation Supervisor – not required

Schedule 4: Specification amendments

The following clauses are amended			
Section number	Clause number	Delete the following	Substitute the following
2	2.3	Delete second sentence.	Replace with 'They shall be competent to undertake the work required which shall include site reconnaissance, supervision of trial pitting, boring and drilling, logging soils to BS5930:2015, making observations of potential contamination, sampling appropriately and liaison with site owners / occupiers'.
3	3.9	... at least one working days' notice...	...at least two working days' notice.....
12.4	12.4.1	Add	<p>1. The following parameters shall be monitored and recorded on each visit to the site. Items iv to viii shall proceed in the order stated and the gas tap shall be closed between the flow and gas concentration stages.</p> <ul style="list-style-type: none"> i) Weather conditions on the day of and 24 hours prior to the visit. ii) Air temperature. iii) Barometric Pressure on day of visit and preceding 3 days. iv) Downhole temperature. v) Downhole pressure and equilibrium flow rate. vi) Timed initial, peak and steady state equilibrium concentrations (% vol) of CH₄, CO₂ and O₂ (ppm) concentrations of Volatile Organic Compounds (VOCs) and flow rates up to 3 minutes. If equilibrium is not achieved after 3 minutes the rate and direction of concentration change shall be recorded. vii) If concentrations of CH₄ exceed 1.0% vol., concentrations of CO₂ exceed 5.0% vol, concentrations of Volatile Organic Compounds (VOCs) exceed 20ppm or concentrations of oxygen are less than 10% vol, collect gas samples for laboratory analysis then fully purge borehole with nitrogen, close valve and remeasure 60 minutes after purging. viii) If post purge concentrations of CH₄ exceed 1.0% vol., concentrations of CO₂ exceed 5.0% vol, concentrations of Volatile Organic Compounds (VOCs) exceed 20ppm or concentrations of oxygen are less than 10% vol, collect a second set of gas samples for laboratory analysis. <p>Engineer approval shall be obtained prior to commencement of any laboratory analysis.</p>

			<ol style="list-style-type: none"> 2. Monitoring on-site shall generally be undertaken using portable handheld equipment. The performance specification and accuracy of the equipment employed shall be stated in the final report. 3. Any damage to the monitoring installation or incidents of open gas taps upon arrival shall be recorded. 4. The name of the person monitoring shall be stated and wherever possible the same person should be used on each monitoring visit to maximise consistency. It is desirable monitoring visits are coordinated so as to include 'worst case' events comprising periods of rapidly falling barometric pressure.
12.2	12.2	Add	<p>On each occasion of groundwater monitoring, sample collection shall be accompanied by records of:</p> <ol style="list-style-type: none"> 1. Groundwater levels in standpipes; 2. Thickness and depth of any hydrocarbon free product (LNAPL or DNAPL); 3. Description of water condition including water colour, odour, turbidity and any hydrocarbon free product.
15.2	15.2	Add	<ol style="list-style-type: none"> 1. Where additional testing outside the original scope of works is required, the analytical methods shall be agreed between the Engineer and Contractor. 2. Only laboratories and analytical methods accredited to and compliant with the 'MCERTS all Performance Standard for Laboratories Undertaking Chemical Testing of Soil' shall be used. Laboratories shall be BS EN ISO/IEC 17025:2000 accredited. 3. All analytical data presented shall be reported in accordance with the MCERTS Standard.

SCHEDULE 5: SPECIFICATION ADDITIONS

The following clauses are amended		
Section number	Clause number	Clause wording
3	3.15.1	Additional sentence: <i>'The Contractor shall take every reasonable precaution to ensure the safety of all persons entitled to be on the site and shall keep the site and site operations in an orderly state. He shall provide and maintain at his own expense all lights, guards, fencing and warning signs as may be required. Fencing shall be suitably robust. The Contractor shall reinstate surfaces/services in such a manner as to ensure that the Employer is safeguarded from any public liability associated with damage on accident.'</i>
3	3.26	Additional sentence: 'The Contractor shall be fully responsible for the proper classification and disposal of all waste arisings that require removal from the site as part of the site investigation/and reinstatement works. The soil results produced as part of the works can be used, as appropriate, in this regard. Soils classification shall be in accordance with EA guidance document 'Framework for the Classification of Contaminated Soils or Hazardous Waste' Version 1, 2004; WM2 (as amended) and all subsequent best practice guidance amendments for waste.
3	3.28 (New Clause)	CDM The current site investigation is considered to be notifiable under the Construction (Design and Management) Regulations 2015. A Designers Risk Assessment is appended to this specification. The Contractor is required to act as Principal Contractor. The Principal Designer is thought to be Kier Construction London; this will be confirmed at a later date. The contractor shall produce appropriate Construction Phase Plans as per the requirements of CDM 2015.
3	3.29 (New Clause)	Sub Contracting Sub-contracting of any part of the works is not permitted unless the proposed sub-contractors are included in the tender or the written approval of the Engineer is obtained. All sub-contractors should have in place appropriate written quality control and quality assurance procedures. Evidence of UKAS accreditation for the specified testing and testing laboratory shall be provided to the Engineer in the tender.
3	3.31 (New Clause)	Asbestos It should be presumed that there is potential for asbestos containing materials to occur in the ground and structures at any site. Health and safety provisions shall be made by the Contractor to consider such an eventuality and to ensure the safety of workers. Particular care is to be taken during the site works to establish if bulk asbestos is present on the site. If asbestos is encountered which is either 'notifiable' or requires additional Health and Safety controls, all work of a disruptive nature is to cease and appropriate measures are to be agreed with the Engineer and the provisions of the Health and Safety Executive to render the asbestos safe in these circumstances. Work to be carried out in accordance with Control of Asbestos Regulations 2012.

SCHEDULE 6: LIST OF ACTIVITIES

(To be completed by tenderer)

SCHEDULE 7: INFORMATION REQUIRED

(To be completed by tenderer)

SCHEDULE 8: LIST OF PREMISES AND SUBCONTRACTORS

(To be completed by tenderer)

BILL OF QUANTITIES FOR GROUND INVESTIGATION

Preamble

1. In this Bill of Quantities the sub-headings and item descriptions identify the work covered by the respective items. The exact nature and extent of the work to be performed shall be ascertained by reference to the Conditions of Contract, the Specification and the Schedules and Appendices to the Specification, as appropriate. The rates and prices entered in the Bill of Quantities shall be deemed to be the full inclusive value of the work covered by the several items, including the following unless stated otherwise:
 - a) Contract management and superintendence, labour and all costs in connection therewith
 - b) The supply of materials, goods, storage, facilities and services and all costs in connection therewith, including wastage and delivery to site
 - c) Plant and all costs in connection therewith
 - d) Fixing, erecting and installing or placing of materials and goods in position
 - e) All temporary works
 - f) All general obligations, requirements, liabilities and risks involved in the execution of the investigation as set forth or implied in the documents on which the tender is based
 - g) Establishment charges, overheads and profit
 - h) Bringing plant and sampling, in situ testing and monitoring equipment to the site of each exploratory hole, erecting, dismantling and removing on completion
 - i) On completion, removal of all equipment and services from site and disposal of arisings.
2. Unless identified as Not required, all items in section A of the Bill of Quantities (general items, provisional services and additional items), and also all items in subsequent sections against which quantities are entered shall be priced.
3. If lump-sum items are not required by the Contractor, this shall be stated against the rate item in the Bill of Quantities and £0.00 entered in the amount. Where rates are not priced they shall have £0.00 placed against them and £0.00 entered in the amount.
4. When full- or part-time professional attendance on site is required in accordance with Clause 3.5.2, this shall normally be paid for under Item A7 of the Bill of Quantities.

Unless otherwise detailed in Schedule S1.8.2, the on-site professional attendance services provided by the technical staff shall comprise the technical supervision of site activities, site liaison, logistics, logging, in situ testing and sampling, photography and the preparation of daily records and preliminary logs (except where any of the above activities are carried out by site operatives and boring/drilling operatives).

When individuals are not carrying out their specific duties or are otherwise away from site, then daily rates will not apply and these costs will be deemed to be covered under general items.
5. The rate entered under Item A3 shall include the provision of any additional PPE, ground surface protection measures, additional welfare and hygiene facilities and plant and equipment decontamination facilities required as a direct result of the contamination or hazard(s) detailed in Schedule S1.84 and/or S1.8.6.
6. The item for photographs shall allow for the standing time of associated plant and supply of negatives, enprints and bound volume or electronic equivalents.
7. Rates for moving plant and equipment to the site of each exploratory hole shall allow for the formation of access routes and working areas and making good avoidable damage to access routes and working areas on completion as required by the Contract.
8. The rates for moving rotary drilling plant to the site of each hole shall include for setting up over a previously formed borehole, including for any additional costs arising from pulling casings left in the ground or providing temporary casings.

9. Payment for forming exploratory holes shall be based on:
- full thickness of strata investigated and described in accordance with the Specification
 - depths measured from ground level
 - depth measured from original ground level where an inspection pit has been excavated
 - that part of a drillhole below the bottom of a borehole where a drill hole has been ordered to continue from the bottom of a borehole
 - core recovery of a least 90% in any core run, unless the Investigation Supervisor is satisfied it cannot be achieved
 - volume calculated as measured length times measured depth times specified width for trial and observation trenches.

10. Rates for forming exploratory holes shall allow for:

- temporary casing installation, where necessary, and removal
- dealing with surface water
- backfilling with arisings
- taking information and supply of daily record for works carried by site operatives
- additional site supervision of non-qualified operatives.

11. Rates for aquifer protection measures shall allow for the measures detailed in Schedule S1.8.13.

12. Standing time shall be measured as the duration of time for which plant, equipment and personnel are standing on the instruction of the Investigation Supervisor or in accordance with the Specification.

Standing time shall be paid for interruption of the formation of exploratory holes to record groundwater entry in accordance with clause 7.7. The rates for standing time shall include for:

- plant equipment and personnel
- consequential costs
- changes in the programme of working
- recording information and preparing daily record

13. The rates for daily provision of dynamic sampling and probing, hand augering and pitting and trenching crews and equipment at locations as directed by the Investigation Supervisor shall allow for compliance with the requirements of the Contract, including preparation of records (unless the Investigation supervisor takes responsibility for the logging and preparation of records).

The rates for dynamic sampling Items B15-B17 and B19 shall include for the provision of liners.

14. The rates for sampling shall allow for the standing time of associated plant. The rates for sampling shall also include for the costs of the sample containers and transport and storage of the samples up to the specified time limits.

The rate for taking a U100 or UT100 sample does not include for recovery of a sample from the cutting shoe.

The rates for each of Items E14.1-E15.3 shall include for all necessary containers and collected samples for an individual determination of the specified contamination or WAC suite.

15. The rates for insitu testing shall allow for the standing time of associated plant and for interpretation and presentation of the results on preliminary logs/exploratory hole logs or on separate agreed report forms using the same dates of presentation as the exploratory hole to which they refer.

In the case of the self-boring pressuremeter, high-pressure dilatometer or Menard pressuremeter, the rates shall also allow for the mutual standing of the respective boring/drilling plant and specialist testing equipment and crews during the combined process.

Where in situ testing is paid for on an hourly basis, the time measured shall be the actual time taken to carry out the test in accordance with the Investigation Supervisor's instruction and/or the Specification but excluding the time taken to erect and dismantle test equipment where this is itemised separately.

The rate for carrying out an SPT (whether using a split spoon or solid cone) does not include for recovery of an associated sample.

16. The rates for cone penetration tests Items F15 and F21 shall allow for provision of daily records and for interpretation and presentation of the results on agreed report forms/exploratory hole logs in accordance with BS 1377 and Schedules 1.13.3 or 1.13.4.

For the seismic cone, the recorded and presented data shall include the specified CPT data recorded between seismic test depths.

The rates for dynamic probing shall allow for undertaking and reporting torque measurements at the prescribed vertical intervals.

17. The rates for installation of instruments shall allow for:

- a) clearing and keeping the hole free of unwanted materials
- b) all costs associated with equipment, installation, specified seals, surround and backfill materials excluding backfill below the instrument
- c) proving correct functioning
- d) delays due to installations, including the setting time for grout
- e) recording information and preparing daily record and additional reports.

18. The rates for monitoring and sampling of installations during the fieldwork period shall allow for:

- a) purging and dealing with disposal of recovered water
- b) all costs associated with consumables and provision of data recording equipment to site
- c) proving correct calibration and recalibration
- d) recording information, preparing, updating and submitting additional reports successively and at the completion of monitoring, including notification of any unexpected readings and/or variation in readings
- e) delays due to interruptions of other site activities.

The rates for monitoring and sampling of installations during the post-fieldwork period shall allow for:

- a) items (a) – (d) above
- b) all costs associated with remobilising the appropriate (number and experience) staff to site and all travelling and accommodation expenses.

The rates for recording of water level, ground gas or other monitoring measurements shall allow for notices of re-entry to the Investigation Supervisor, owners or occupiers affected by the location or access route.

19. The rates for laboratory testing shall include for:

- a) the supply of a copy of the preliminary test results to the Investigation Supervisor
- b) notification of unavailable test samples, failed tests and/or deviating samples (eg. samples not correctly preserved)
- c) the cost of determining a parameter (eg. moisture content or density) where that parameter forms part of the information to be reported for the specified test (eg. undrained shear strength, consolidation test or unconfined compressive strength)
- d) the disposal of samples in accordance with the relevant regulations.

20. The provisional sum, Item A6, for the off-site disposal of contaminated waste shall include for temporary storage and for organising the transport and disposal by a suitably licenced waste disposal contractor. Payment shall be made only against receipted invoices.

The costs of laboratory testing to determine the nature of the waste shall be covered by laboratory testing rates for tests actually completed and to an agreed schedule. Those sums shall be offset against the provisional sum Item A6.

21. Appendix A to the Bill of Quantities (Rates for Ground Practitioners and other Personnel) shall be priced. The rates given will be used by the Investigation Supervisor to make an initial estimate of costs, where applicable, of employing the Contractor's staff in accordance with Clauses 3.5.2, 3.6.1 and/or 3.6.2 of the Specification.
22. Items for the supply of the master and copies of the Desk Study Report, Ground Investigation Report and/or Geotechnical Design Report shall include the printing and supply of the specified number of draft and final copies (Specification Clause 16.11 and Schedule S1.21.13). All other duties in compiling, preparing and checking the draft and final reports shall normally be paid for either under Item A7 of the Bill of Quantities or using the rates given under Appendix A.

23. **Units of measurement**

The following abbreviations shall be used for the units of measurements

Millimetres: mm
 Metre: m
 Kilometre: km
 Square millimetres: mm²
 Square metre: m²
 Cubic metre: m³
 Square metre per day: m²/day
 Linear metre: lin.m
 Kilogramme: kg
 Tonne: t
 Sum: sum
 Number: nr
 Hour: h
 Week: wk
 Vehicle week: v.wk
 Item: item
 Day: day
 Specimen day: sp.day
 Person day: p.day

Preamble amendments and additions shall be entered below, using sequential numbers to those above.

The following clauses are amended or added to the Preamble.

Bill of Quantities

The following pages constitute the Bill of Quantities.

Bill of Quantities**Bill A: General Items, provisional services and additional items**

Number	Item Description	Unit	Quantity	Rate	Amount £
A	General items, provisional services and additional items				
A1	Offices and stores for the Contractor	sum	R/O		
A2	Establish on site all plant, equipment and services for a Green Category site.	sum	1		
A3	Extra over Item A2 for a Yellow Category site	sum	1		
A4	Maintain on site all site safety equipment for a Yellow Category site	week	1		
A5	Decontamination of equipment during and at end of intrusive investigation for a Yellow Category site.	sum	1		
A6	Appropriate storage, transport and off-site disposal of contaminated arisings and any PPE equipment, excluding laboratory testing.	provisional sum	1		
A7	Provide professional attendance in accordance with Clause 3.5.2	sum	1		
A8	Establish the location and elevation of the ground at each exploratory hole	sum	1		
A9	Preparation of Health and Safety documentation and Safety Risk Assessment	sum	1		
A21a	Electronic copy of Ground Investigation Report (or specified part thereof)	sum	1		
A25	Digital data in AGS transfer format	sum	1		
	Contract specific additional bill items				
A30	Specialist Buried Services Search	sum	1		
A31	Principal Contractor	sum	1		
A32	Meetings	nr	R/O		
A33	Coring / breaking out of concrete at exploratory hole locations (coring required at CBR locations). Note presence of suspended floor slabs.	sum	1		

Total section A carried to summary

Bill B: Percussion boring

Number	Item Description	Unit	Quantity	Rate	Amount £
B	Percussion boring (de-mountable rig)				
B1	Move boring plant and equipment to the site of each exploratory hole and set up	nr	3		
B4	Advance borehole between existing ground level and 10m depth	m	30		
B5	As Item B4 but between 10m and 20m depth	m	25		
B6	As Item B4 but between 20m and 30m depth	m	10		
B7	As Item B4 but between 30m and 40m depth	m	R/O		
B9	Advance borehole through hard stratum or obstruction	h	3		
B11	Backfill borehole with cement/bentonite grout where no installation required.	m	R/O		
B12	Standing time for borehole plant, equipment and crew	h	R/O		
	Contract specific additional bill items				

Total section B carried to summary

Bill C: Rotary Drilling
Not required

Bill D: Pitting and trenching

Number	Item Description	Unit	Quantity	Rate	Amount £
D	Pits and Trenches				
	<u>Inspection pits</u>				
D1a	Excavate inspection pit by hand to an appropriate depth (minimum 1.20m bgl)	nr	3		
	<u>Observation pits and trenches</u>				
D14	Move equipment to the site of each hand dug observation pit or trench of not greater than 4.5m depth	nr	4		
D17	Excavate hand dug observation pit between existing ground level and 3.0m depth	m	8		
D18	As Item D17 but between 3.0 and 4.5m depth	m	R/O		
D28	Standing time for excavation plant, equipment and crew for hand dug observation pit or trench	h	R/O		
	<u>General</u>				
D37	Bring pump to the position of each exploratory pit or trench	nr	4		
D38	Pump water from pit or trench	h	7.5		
D39	Extra over Item D38 for temporary storage, treatment and disposal of contaminated water	Provisional sum	1		
D40	Leave open observation pit or trench	m ² /day	R/O		
	Contract specific additional bill items				

Total section D carried to summary

Bill E: Sampling and monitoring during intrusive investigation

Number	Item Description	Unit	Quantity	Rate	Amount £
E	Sampling and monitoring during intrusive investigation				
	<u>Samples for geotechnical purposes</u>				
E1	Small disturbed sample	nr	77		
E2	Bulk disturbed sample	nr	24		
E3	Large bulk disturbed sample	nr	R/O		
E4.1a	Open-tube sample using thick-walled (OS-TK/W) sampler (including U100)	nr	R/O		
E4.2a	Open-tube sample using thin-walled (OS-T/W) sampler (including UT100)	nr	30		
E6	Groundwater sample	nr	7		
E7	Ground gas sample	nr	R/O		
E8	Cut, prepare and protect core sub-sample	nr	R/O		
	<u>Containers for contamination assessment and WAC testing</u>				
E14.1	Provision of containers and collection of samples for soil contamination suites (S1.20.3)	nr	42		
E14.2	Provision of containers and collection of samples for water contamination suites (S1.20.3)	nr	7		
E14.3	Provision of containers and collection of samples for gas contamination suites (S1.20.3)	nr	4		
E15.1	Provision of containers and collection of samples for WAC suites (S1.20.5)	nr	R/O		
	Contract specific additional bill items				

Total section E carried to summary

Bill F: Probing and cone penetration testing
Not required

Bill G: Geophysical testing
Not required

Bill H: In situ testing

Number	Item Description	Unit	Quantity	Rate	Amount £
H	In situ testing				
H1	Standard penetration test in borehole	nr	32		
H4	California Bearing Ratio test by TRL probe.	nr	4		
H5	Excavate and log soils at TRL probe location to 1.2m bgl maximum.	nr	4		
H8	Hand vane test (set of 3 readings)	nr	6		
	<u>Miscellaneous site testing</u>				
H84	Reading of free product level in borehole using an interface probe	nr	R/O		
H85	Provide contamination screening test kits per sample	nr	R/O		
H86	Carry out headspace testing by FID/PID	nr	3		
	Contract specific additional bill items				

Total section H carried to summary

Bill I: Instrumentation

Number	Item Description	Unit	Quantity	Rate	Amount £
I	Instrumentation				
	<u>Standpipes and piezometers</u>				
I1	Backfill exploratory hole with cement/bentonite grout below standpipe or standpipe piezometer	m	35		
I2	Provide and install standpipe (19mm)	m	R/O		
I7	Provide and install ground gas monitoring standpipe (50mm)	m	30		
I9	Provide and install headworks for ground gas monitoring standpipe, standpipe or standpipe piezometer	nr	3		
I10	Provide and install protective cover (flush)	nr	3		
I15	<u>Standpipe and piezometer development</u>				
I15.1	Supply equipment and personnel to carry out development by surging	nr	3		
I15.2	Develop standpipe or piezometer by surging	h	9		
I15.9	Disposal of development water, not including chemical testing	Provisional sum	1		
	Contract specific additional bill items				

Total section I carried to summary

Bill J: Installation monitoring and sampling

Number	Item Description	Unit	Quantity	Rate	Amount £
J	Installation monitoring and sampling (during fieldwork period)				
J1	Reading of water level in standpipe or standpipe piezometer during fieldwork period	nr	R/O		
J8	Reading of free product level in standpipe using an interface probe during fieldwork period	nr	R/O		
	Installation monitoring and sampling (post fieldwork period)				
J9	Return visit to site following completion of fieldwork to take readings in, or recover samples from, installations	nr	3		
J10	Extra over Item J9 for reading of water level in standpipe or standpipe piezometer during return visit	nr	3		
J11	Extra over Item J9 for ground gas measurement in ground gas monitoring standpipe during return visit	nr	3		
J17	Extra over Item J9 for reading of free product level in standpipe using an interface probe during return visit to site	nr	3		
	Contract specific additional bill items				

Total section J carried to summary

Bill K: Geotechnical laboratory testing

Number	Item Description	Unit	Quantity	Rate	Amount £
K	Geotechnical laboratory testing				
K1	<u>Classification</u>				
K1.1	Moisture content	nr	24		
K1.2	Liquid limit, plastic limit and plasticity index	nr	12		
K1.8	Particle density by gas jar or pycnometer	nr	R/O		
K1.9	Particle size distribution by wet sieving	nr	6		
K1.11	Sedimentation by pipette	nr	6		
K2	<u>Chemical and electrochemical</u>				
K2.1	Organic matter content	nr	6		
K2.2	Mass loss on ignition	nr	R/O		
K2.3	Sulphate content of acid extract from soil	nr	6		
K2.4	Sulphate content of water extract from soil	nr	12		
K2.5	Sulphate content of groundwater	nr	3		
K2.8	Water soluble chloride content	nr	R/O		
K2.9	Acid soluble chloride content	nr	R/O		
K2.10	Total sulphur content	nr	6		
K2.12	pH value	nr	12		
K3	<u>Compaction related</u>				
K3.1	Dry density/moisture content relationship using 2.5kg rammer	nr	R/O		
K3.4	Extra over Items K3.1, K3.2 and K3.3 for use of CBR mould	nr	R/O		
K3.9	California Bearing Ratio on re-compacted disturbed sample	nr	R/O		
K3.10	Extra over Item K3.9 for soaking	day	R/O		
K4	<u>Compressibility, permeability and durability</u>				
K4.1	One-dimensional consolidation properties, test period 5 days	nr	R/O		

Number	Item Description	Unit	Quantity	Rate	Amount £
K4.2	Extra over Item K4.1 for test period in excess of 5 days	day	R/O		
K4.3	Measurements of swelling pressure, test period 2 days	nr	R/O		
K4.11	Frost heave of soil	nr	R/O		
K6	<u>Shear strength (total stress)</u>				
K6.12	Residual shear strength using the small ring shear apparatus at three normal pressures, test duration not exceeding 4 days	nr	R/O		
K6.13	Extra over Item K6.12 for test duration in excess of 4 days	day	R/O		
K6.16	Undrained strength of a single 100mm diameter specimen in triaxial compression without the measurement of pore pressure	nr	30		
K7	<u>Shear strength (effective stress)</u>				
K7.3	Consolidated drained triaxial compression test with measurement of volume change (set of three 38mm specimens), test duration not exceeding 4 days per specimen	nr	R/O		
K7.4	As Item K7.3 but single-stage or multi-stage test using 100mm diameter specimen, test duration not exceeding 4 days	nr	R/O		
K7.5	Extra over Items K7.1 and K7.3 for test duration in excess of 4 days per specimen	sp. Day	R/O		
K7.6	Extra over Items K7.2 and K7.4 for test duration in excess of 4 days	day	R/O		
Contract specific additional bill items					
K10.1	Mg in 2:1 water soil extract	nr	3		
K10.2	NO ₃ in 2:1 water soil extract	nr	3		
K10.3	Cl in 2:1 water soil extract	nr	R/O		
K10.4	Ammonium ions in Soil (BR279)	nr	3		
K10.5	Groundwater pH	nr	R/O		
K10.6	Soluble Mg in groundwater	nr	R/O		
K10.7	Groundwater NO ₃	nr	R/O		

Number	Item Description	Unit	Quantity	Rate	Amount £
K10.8	Groundwater Cl	nr	R/O		

Total section K carried to summary

Bill of Quantities Section L: Geoenvironmental laboratory testing – Notes for Guidance

Number	Item Description (these are given as summary reminders – the Contractor shall refer to Schedule 1.20.3 for full details)	Unit	Quantity	Rate	Amount £
Soil	Suite s1.1 – basic suite	nr	21		
	Suite s1.2 - phenol	nr	R/O		
	Suite s1.3 – asbestos in soil (screening)	nr	R/O		
	Suite s1.4 - TOC	nr	R/O		
	Suite s1.5 - sulphate	nr	R/O		
	Suite s1.6 - general suite with waste classification parameters	nr	R/O		
	Suite s1.7 TPHCWG	nr	R/O		
	Suite s1.8 – screen for ACM in soil (stereo microsc.)	nr	15		
	Suite s1.9 – Asbestos ID in bulk materials (PLM)	nr	R/O		
	Suite s1.10 - Asbestos quant. in soil (PLM)	nr	R/O		
	Suite s1.11 - Asbestos detailed quant. in soil (PCOM)	nr	7		
	Suite s1.12 – soil leachate preparation (for leachate analysis as water)	nr	R/O		
	Suite S1.13 – Fraction Organic Carbon	nr	4		
	PCBs total arochlors	nr	R/O		
	VOCs target list US EPA	nr	7		
Water	Suite w1.1 – general suite	nr	3		
	w1.2 - PAH (total)	nr	R/O		
	w1.3 - PAH (total of USEPA 16)	nr	R/O		
	w1.4 - PAH (16 speciated) (Modified EPA 8100)	nr	R/O		
	w1.5 - TPH – CWG (C5-35) based on TNRCC method 1006	nr	3		
	w1.6 - Petrol Range Organics/BTEX/MTBE	nr	R/O		
	w1.7 - BTEX by GC-MS (Modified US EPA 8150)	nr	R/O		
	w1.8 - SVOCs target list (one extraction only) (Modified US EPA 8270)	nr	R/O		
	w1.9 - SVOC scan (up to 10 peaks, >80% fit)	nr	R/O		
	w1.10 - VOCs target list only (Modified US EPA 8260)	nr	3		
	w1.11 - VOCs target list plus TICs (top 10 peaks to 0.01mg/1 only) (Modified US EPA 8260)	nr	R/O		
	w1.12 - Phenols (total) by HPLC	nr	R/O		
	w1.13 - Phenols (speciated)	nr	R/O		
Gas	Suite g1.1 – bulk gases	nr	R/O		
	Suite g1.2 – C1-C7	nr	4		
	Suite g1.3 – VOCs incl. BTEX	nr	4		
Waste	WAC Leachate	nr	R/O		
	Full WAC Soil Suite	nr	R/O		
	Inert WAC Soil Suite	nr	R/O		

Hazardous WAC Soil Suite	nr	R/O		
Contract specific additional bill items				

Total section L carried to summary

SUMMARY OF BILL OF QUANTITIES

		£
A.	General items, provisional services and additional items	
B.	Percussion boring	
C.	Rotary drilling	
D.	Pitting and trenching	
E.	Sampling and monitoring during intrusive investigation	
F.	Probing and cone penetration testing	
G.	Geophysical testing	
H.	In situ testing	
I.	Instrumentation	
J.	Installation monitoring and sampling	
K.	Geotechnical laboratory testing	
L.	Geoenvironmental laboratory testing	
	Total Tender	
	Of which £ _____ is for interpretative report	
	Contingency sum to be expended only on the direction of the Engineer – 10% Total Tender	
	TOTAL	

	Fee for entering into collateral warranty in the form appended.	
--	---	--

Appendix A. Rates for Geotechnical and Other Personnel

Rates shall be entered for the various grades of staff listed, who will be employed by agreement with the Engineer for advisory work for the Engineer on site on the conduct of the investigation, in accordance with Specification Clause 3.13 and Schedule 1 or subsequent to the preparation of the Site Investigation Report. This excludes the superintendence and technical direction required under the Conditions of Contract and the requirements of Clauses 3.12, 4.4.2, 5.3.6, 5.4.2, 6.5 and 7.11 which must be covered by the rates and prices entered in the main Bill of Quantities (see clause 1 of the preamble to the Bill of Quantities), and the preparation of the report which must be covered by the items in Section A of the Bill of Quantities.

Item	Item Description	Unit	Rate £
1	Technician	h	
2	Incorporated Engineer	h	
3	Graduate Engineer/Geologist/Environmental Scientist	h	
4	Graduate Engineer/Geologist/Environmental Contractor with at least 3 years of relevant experience since graduation	h	
5	Chartered Engineer/Geologist/Environmental Contractor with at least 5 years of relevant experience	h	
6	Principal chartered Engineer/Geologist/ Environmental Contractor with at least 10 years of relevant experience	h	
	Expenses incurred by staff on site visits or who are resident by agreement with the Engineer	h	
7	Fare per kilometre from Contractor's premises and return for Items 1, 2 and 3	km*	
8	As above but for Items 4, 5 and 6	km*	
9	All other expenses incurred in conjunction with a site visit where a return journey is made on the same day for Items 1, 2 and 3	visit	
10	As above but for Items 4, 5 and 6	visit	
11	All other expenses incurred in connection with visit where an overnight stay is necessary for Items 1, 2, and 3	night	
12	As above but for Items 4, 5 and 6.	night	

* Where considered more appropriate, 'mile' may be used.

FORM OF WARRANTY



For use where a collateral warranty is to be given by a consultant to a funder of a commercial or industrial development

Please note that the Standard Form has been amended at Clauses 10.1 and 10.2 to accord with CampbellReith policy.

THIS AGREEMENT

is made the day of 20.....

Between

1 Insert name of Consultant 1. 1

whose address/registered office is at

.....
.....

(the 'Consultant') and

2 Insert name of Consultant's Client 2. 2

whose address/registered office is at

.....
.....

(the 'Client') and

3 Insert name of Funder 3. 3

whose address/registered office is at

.....
.....

(the 'Funder').

Whereas

A. The Funder and the Client have entered into an agreement ('the Finance Agreement') for the provision of finance in connection with the carrying out of

4. Insert description of 4



works

5. *Insert address of Development* 5

(the 'Development').

6. *Insert date of Appointment* B. By a contract dated⁶ (the 'Appointment'),
which shall include any variation thereto, the Client has appointed the Consultant

7. *Insert discipline* as⁷
in connection with the Development.

8. *Delete as appropriate* C. The Client has entered/may enter⁸ into a contract

9. *If Building Contract signed, insert date; if not, delete word 'dated'* [dated⁹] (the 'Building Contract')

10. *Insert name of contractor of 'a contractor to be selected'* with¹⁰

(the 'Contractor') for the construction of the Development.

Now it is hereby agreed

11. *Insert figure* In consideration of the payment of £¹¹ by the Funder to the Consultant, receipt of which the Consultant hereby acknowledges:

1. The Consultant warrants to the Funder that it has exercised and will continue to exercise reasonable skill care and diligence in the performance of its services to the Client under the Appointment.

2. In the event of any breach of this Agreement giving rise to losses recoverable by the Funder as a result of such breach (the 'Funder's losses'):

(a) Without prejudice to any other exclusion or limitation of liability, damages, loss, expense or costs the Consultant's liability for any claim or claims under this Agreement shall be limited to that proportion of the Funder's losses as it would be just and equitable to require the Consultant to pay having regard to the extent of the Consultant's responsibility for the same and on the assumptions that:

(i) all other consultants and advisers, contractors and subcontractors involved in the Development have provided contractual undertakings on terms no less onerous than those set out in clause 1 to the Funder in respect of the carrying out of their obligations in connection with the Development; and

(ii) there are no exclusions of or limitations of liability nor joint insurance or

co-insurance provisions between the Funder and any other party referred to in this clause 2 and any such other party who is responsible to any extent for the Funder's losses is contractually liable to the Funder for the same; and

(iii) all the parties referred to in this clause 2 have paid to the Funder such sum as it would be just and equitable for them to pay having regard to the extent of their responsibility for the Funder's losses.

(b) The Consultant shall be entitled in any action or proceedings by the Funder to rely on any limitation or exclusion in the Appointment and to raise the equivalent rights in defence of liability as it would have against the Client under the Appointment.

(c) The obligations of the Consultant under or pursuant to this Agreement shall not be released or diminished by the appointment of any person by the Funder to carry out any independent enquiry into any relevant matter.

12 Ensure clause is consistent with any deleterious clause in Appointment; delete if Consultant is a QS or planning supervisor

3. ¹² The Consultant has exercised and will continue to exercise reasonable skill and care to see that, unless authorised by the Client in writing or, where such authorisation is given orally, confirmed by the Consultant to the Client in writing, materials specified by it for use in the Development are in accordance with the guidelines contained in the edition of the publication *Good Practice in Selection of Construction Materials* (Ove Arup & Partners) current at the date of its specification.

4. The Funder has no authority to issue any direction or instruction to the Consultant in relation to the performance of the Consultant's services under the Appointment unless and until the Funder has given notice under clause 6 or 7.

5. The Consultant acknowledges that the Client has paid all fees and expenses properly due and owing to the Consultant under the Appointment up to the date of this Agreement. The Funder has no liability to the Consultant in respect of fees and expenses under the Appointment unless and until the Funder has given notice under clause 6 or 7.

6. The Consultant agrees that, in the event of the termination of the Finance Agreement by the Funder before completion of the services under the Appointment, the Consultant will, if so required by notice in writing given by the Funder and subject to clause 8, accept the instructions of the Funder or its appointee to the exclusion of the Client in respect of the Development upon the terms and conditions of the Appointment. The Client acknowledges that the Consultant shall be entitled to rely on a notice given to the Consultant by the Funder under this clause as conclusive evidence for the purposes of this Agreement of the termination of the Finance Agreement by the Funder; and further acknowledges that such acceptance of the instructions of the Funder to the exclusion of the Client shall not constitute any breach of the Consultant's obligations to the Client under the Appointment.

7. The Consultant further agrees that it will not without first giving the Funder not less than twenty one days' notice in writing exercise any right it may have to terminate the Appointment or to treat the same as having been repudiated by the Client or to discontinue the performance of any services to be performed by the Consultant pursuant thereto. Such right to terminate the Appointment with the Client or treat the same as having been repudiated or discontinue performance shall cease if, within such period of notice and subject to clause 8, the Funder shall give notice in writing to the Consultant requiring the Consultant to accept the instructions of the

Funder or its appointee to the exclusion of the Client in respect of the Development upon the terms and conditions of the Appointment.

8. It shall be a condition of any notice given by the Funder under clause 6 or 7 that the Funder or its appointee accepts liability for payment of the fees and expenses payable to the Consultant under the Appointment and for performance of the Client's obligations including payment of any fees and expenses outstanding at the date of such notice. Upon the issue of any notice by the Funder under clause 6 or 7, the Appointment shall continue in full force and effect as if no right of termination on the part of the Consultant, nor any right of the Consultant to treat the Appointment as having been repudiated by the Client, nor to discontinue the performance of any services, had arisen and the Consultant shall be liable to the Funder and its appointee under the Appointment in place of its liability to the Client. If any notice given by the Funder under clause 6 or 7 requires the Consultant to accept the instructions of the Funder's appointee, the Funder shall be liable to the Consultant as guarantor for the payment of all sums from time to time due to the Consultant from the Funder's appointee.

13 Delete clause if Consultant does not retain copyright/amend as appropriate according to the terms of Appointment

9. ¹³ The copyright in all drawings, reports, models, specifications, bills of quantities, calculations and such other documents and information prepared by or on behalf of the Consultant pursuant to the Appointment (the 'Documents') shall remain vested in the Consultant. Subject (save in the case of the documents for the health and safety file) to the Consultant having received payment of any fees properly due and owing as at the date of exercise of the licence, the Funder and its appointee shall have a licence to copy and use the Documents and to reproduce the designs and content of them for any purpose related to the Development including, but without limitation, the construction, completion, maintenance, letting, promotion, advertisement, reinstatement, refurbishment and repair of the Development. Such licence shall enable the Funder and its appointee to copy and use the Documents for the extension of the Development but such use shall not include a licence to reproduce the designs contained in them for any extension of the Development. The Consultant shall not be liable for any use by the Funder or its appointee of any of the Documents for any purpose other than that for which the same were prepared by or on behalf of the Consultant.

14 Insert amount

15 Insert amount; if there is no such limit, delete words in brackets

16 Insert period

10. The Consultant shall maintain professional indemnity insurance in an amount each year of not less than £..... ¹⁴ in respect of each and every occurrence or series of occurrences arising out of one event [but limited to £..... ¹⁵ in the aggregate for claims arising out of or in connection with pollution or contamination or asbestos and/or date recognition] for a period of ¹⁶ years from the date of practical completion of the Development under the Building Contract and provided that such insurance is available at commercially reasonable rates. The Consultant shall inform the Funder if such insurance ceases to be available at commercially reasonable rates in order that the Consultant and the Funder can discuss the means of best protecting their respective positions. The Consultant shall, on reasonable request by the Funder, provide documentary evidence that such insurance is being maintained.

- 10.1 The Consultant's liability for any claim or series of claims arising out of the same occurrence or series of occurrences shall not exceed the sum of **£n¹ million** provided that the total liability in respect of all such claims arising out of or in connection with pollution, contamination or toxic mould shall not exceed in aggregate the sum of £n[n] million. Liability in connection with asbestos is

excluded.

- 10.2 Such liability as determined by the aggregate or balance thereof under 10.1 shall be further limited to the lesser of (i) the direct costs reasonably incurred by the Client in cleaning up the site or any part thereof or (ii) the amount, if any, recoverable under the Consultant's professional indemnity insurance policy.

(Clauses 10.1 and 10.2 are additional clauses required to be added to accord with Campbell Reith policy)

17 Delete clause if the law of Scotland applies

11. ¹⁷ The Funder may assign by way of absolute legal assignment only the benefit of this Agreement to a third party who is also providing finance or re-finance in connection with the carrying out of the Development. Any such assignment shall only be effective if written notice thereof is given to the Consultant. No further or other assignment of this Agreement shall be permitted.

18 Delete clause if the law of England and Wales applies

- 11S. ¹⁸ The Funder may assign or transfer the rights under this Agreement without the consent of the Consultant to another person who is also providing finance or re-finance in connection with the carrying out of the Development. Any such assignation shall only be effective if written notice thereof is given to the Consultant in accordance with clause 12. No further or other assignation or transfer of this Agreement shall be permitted.

12. Any notice to be given by the Consultant shall be deemed to be duly given if it is delivered by hand or sent by recorded (signed for) or special delivery to the Funder at the above mentioned address, its registered office or principal place of business for the time being; and any notice given by the Funder shall be deemed to be duly given if it is delivered by hand or sent by recorded (signed for) or special delivery to the Consultant at the above mentioned address, its registered office or principal place of business for the time being. Any such notices, if sent by recorded (signed for) or special delivery, shall be deemed to have been received forty eight hours after being posted (subject to proof to the contrary).

19 Insert period

13. No action or proceedings for any breach of this Agreement shall be commenced against the Consultant after the expiry of ¹⁹ years from the date of practical completion of the relevant part of the Development under the Building Contract or, in the event that practical completion is not achieved, the date that the Consultant finishes its services under the Appointment.

20 Delete clause if the law of Scotland applies

14. ²⁰ Nothing in this Agreement confers or purports to confer on any third party any benefit or any right to enforce any term of this Agreement pursuant to the Contracts (Rights of Third Parties) Act 1999.

FOR USE WHERE THE APPLICABLE LAW IS THAT OF ENGLAND AND WALES

15. This Agreement is subject to the law of England and Wales and the parties hereto submit to the jurisdiction of the courts of England and Wales.

Where the Agreement is to be executed under hand and not as a deed

As witness the hands of the parties hereto



Signed by or on behalf of the Consultant

21 *Name and signature of person signing on behalf of Consultant*
21

Signed by or on behalf of the Client

22 *Name and signature of person signing on behalf of Consultant*
22

Signed by or on behalf of the Funder

23 *Name and signature of person signing on behalf of Funder*
23

Where the Agreement is to be executed as a deed

In witness whereof the parties have executed this Agreement as a deed the day and year first before written

[WHERE THE CONSULTANT IS A SOLE PRACTITIONER OR PARTNERSHIP]

Signed as a deed by the Consultant

24 *Name and signature of sole practitioner or first partner*
24

25 *Name and signature of witness* in the presence of 25

26 *Address of witness* of
26

27 *Name and signature of additional partner* and by
27

in the presence of 25

26 of
26

and by
27

in the presence of 25

26 of
26



[WHERE THE CONSULTANT IS A LIMITED LIABILITY PARTNERSHIP OR COMPANY]

Executed as a deed by the Consultant

28 Name and signature of member or director by
28

29 Name and signature of member or director or company secretary and
29

[WHERE THE CLIENT IS AN INDIVIDUAL OR PARTNERSHIP]

Signed as a deed by the Client

30 Name and signature of individual or first partners
30

25 Name and signature of witness in the presence of 25

26 Address of witness of
26

27 Name and signature of additional partner and by
27

in the presence of 25

26 of
26

and by
27

in the presence of 25

26 of
26

[WHERE THE CLIENT IS A LIMITED LIABILITY PARTNERSHIP OR COMPANY]

Executed as a deed by the Consultant

by
28

and
29



[WHERE THE FUNDER IS A LIMITED LIABILITY PARTNERSHIP OR COMPANY]

Executed as a deed by the Consultant

by
28

and
29

For use where a collateral warranty is to be given by a consultant to a purchaser or tenant of the whole or part of a building project in a commercial or industrial development

Please note that the Standard Form has been amended at Clauses 7.1 and 7.2 to accord with CampbellReith policy.

THIS AGREEMENT

is made the day of 20.....

Between

1 Insert name of Consultant 1. 1

whose address/registered office is at

.....
.....

(the 'Consultant') and

2 Insert name of Purchaser/Tenant 2. 2

whose address/registered office is at

.....
.....

3 Delete as appropriate throughout Agreement (the 'Purchaser'/'Tenant' ³).

Whereas

4 Insert name of Consultant's Client A. The Purchaser/Tenant and 4



- 5. *Delete as appropriate* (the 'Client') have entered into an agreement to purchase/an agreement to lease/ a lease of ⁵
- 6. *Insert description of Premises* ⁶
- 7. *Delete if Premises form the whole of Development* (the 'Premises') [being a part of ⁷].
- 8. *Insert address of Development* ⁸
- 9. *Delete if Premises form part only of Development* (the 'Development'). [The Premises are also referred to in this Agreement as the 'Development'. ⁹]
- 10. *Insert date of Appointment* B. By a contract dated ¹⁰ (the 'Appointment'),
which shall include any variation thereto, the Client has appointed the Consultant
- 11. *Insert discipline* as ¹¹
in connection with the Development.
- 12. *Delete as appropriate* C. The Client has entered/may enter ¹² into a contract
- 13. *If Building Contract signed, insert date; if not, delete word 'dated'* [dated ¹³] (the 'Building Contract')
- 14. *Insert name of contractor of 'a contractor to be selected'* with ¹⁴
(the 'Contractor') for the construction of the Development.

Now it is hereby agreed

15. *Insert figure* In consideration of the payment of £ ¹⁵ by the Purchaser/Tenant to the Consultant, receipt of which the Consultant hereby acknowledges:

- 1. The Consultant warrants to the Purchaser/Tenant that it has exercised [and will continue to exercise ¹⁶] reasonable skill care and diligence in the performance of its services to the Client under the Appointment.
- 2. In the event of any breach of this Agreement:
 - (a) Subject to sub-clauses (b) and (c), the Consultant shall be liable for the

reasonable costs of repair, renewal and/or reinstatement of any part or parts of the Development to the extent that the Purchaser/Tenant reasonably incurs such costs and/or the Purchaser/Tenant is or becomes liable either directly or by way of financial contribution for such costs. The Consultant shall not be liable for other losses incurred by the Purchaser/Tenant:

- (b) Without prejudice to any other exclusion or limitation of liability, damages, loss, expense or costs the Consultant's liability for such costs of the repair, renewal and/or reinstatement in question shall be further limited to that proportion thereof as it would be just and equitable to require the Consultant to pay having regard to the extent of the Consultant's responsibility for the same and on the assumptions that:
 - (i) all other consultants and advisers, contractors and subcontractors involved in the Development have provided contractual undertakings on terms no less onerous than those set out in clause 1 to the Purchaser/Tenant in respect of the carrying out of their obligations in connection with the Development; and
 - (ii) there are no exclusions of or limitations of liability nor joint insurance or co-insurance provisions between the Purchaser/Tenant and any other party referred to in this clause 2 and any such other party who is responsible to any extent for such costs is contractually liable to the Purchaser/Tenant for the same; and
 - (iii) all the parties referred to in this clause 2 have paid to the Purchaser/Tenant such proportion of such costs which it would be just and equitable for them to pay having regard to the extent of their responsibility for the same.
- (c) The Consultant shall be entitled in any action or proceedings by the Purchaser/Tenant to rely on any limitation or exclusion in the Appointment and to raise the equivalent rights in defence of liability as it would have against the Client under the Appointment.
- (d) The obligations of the Consultant under or pursuant to this Agreement shall not be released or diminished by the appointment of any person by the Purchaser/Tenant to carry out any independent enquiry into any relevant matter.

17 Ensure clause is consistent with any deleterious clause in Appointment; delete if Consultant is a QS or planning supervisor

3. ¹⁷ The Consultant has exercised [and will continue to exercise ¹⁸] reasonable skill and care to see that, unless authorised by the Client in writing or, where such authorisation is given orally, confirmed by the Consultant to the Client in writing, materials specified by it for use in the Development are in accordance with the guidelines contained in the edition of the publication *Good Practice in Selection of Construction Materials* (Ove Arup & Partners) current at the date of its specification.

18 Delete if services completed

19 Delete clause if not appropriate

4. ¹⁹ The Consultant acknowledges that the Client has paid all fees and expenses properly due and owing to the Consultant under the Appointment up to the date of this Agreement.
5. The Purchaser/Tenant shall have no authority to issue any direction or instruction to the Consultant in relation to the Appointment.

- 20 Delete clause if Consultant does not retain copyright/amend as appropriate according to the Terms of Appointment*
6. ²⁰ The copyright in all drawings, reports, models, specifications, bills of quantities, calculations and such other documents and information prepared by or on behalf of the Consultant pursuant to the Appointment (the 'Documents') shall remain vested in the Consultant. Subject (save in the case of the documents for the health and safety file) to the Consultant having received payment of any fees properly due and owing as at the date of exercise of the licence, the Purchaser/Tenant and its appointee shall have a licence to copy and use the Documents and to reproduce the designs and content of them for any purpose related to the Premises including, but without limitation, the construction, completion, maintenance, letting, promotion, advertisement, reinstatement, refurbishment and repair of the Premises. Such licence shall enable the Purchaser/Tenant and its appointee to copy and use the Documents for the extension of the Premises but such use shall not include a licence to reproduce the designs contained in them for any extension of the Premises. The Consultant shall not be liable for any use by the Purchaser/Tenant or its appointee of any of the Documents for any purpose other than that for which the same were prepared by or on behalf of the Consultant.
- 21 Insert amount*
7. The Consultant shall maintain professional indemnity insurance in an amount each year of not less than £..... ²¹ in respect of each and every occurrence or series of occurrences arising out of one event [but limited to £..... ²² in the aggregate for claims arising out of or in connection with pollution or contamination and/or asbestos and/or date recognition] for a period of ²³ years from the date of practical completion of the Premises under the Building Contract and provided that such insurance is available at commercially reasonable rates. The Consultant shall inform the Purchaser/Tenant if such insurance ceases to be available at commercially reasonable rates in order that the Consultant and the Purchaser/Tenant can discuss the means of best protecting their respective positions. The Consultant shall, on reasonable request by the Purchaser/Tenant, provide documentary evidence that such insurance is being maintained.
- 22 Insert amount; if there is no such limit, delete words in brackets*
- 23 Insert period*
- 7.1 The Consultant's liability for any claim or series of claims arising out of the same occurrence or series of occurrences shall not exceed the sum of **£n² million** provided that the total liability in respect of all such claims arising out of or in connection with pollution, contamination or toxic mould shall not exceed in aggregate the sum of £n[n] million. Liability in connection with asbestos is excluded.
- 7.2 Such liability as determined by the aggregate or balance thereof under 10.1 shall be further limited to the lesser of (i) the direct costs reasonably incurred by the Client in cleaning up the site or any part thereof or (ii) the amount, if any, recoverable under the Consultant's professional indemnity insurance policy.
- (Clauses 7.1 and 7.2 are additional clauses required to be added to accord with Campbell Reith policy)
- 24 Delete clause if the law of Scotland applies*
8. ²⁴ The Purchaser/Tenant may assign by way of absolute legal assignment only the benefit of this Agreement to a third party who also takes an assignment of the Purchaser's/Tenant's interest in the Premises (the 'First Assignee'). The First Assignee may assign by way of absolute legal assignment only the benefit of this Agreement to a third party who also takes an assignment of the First Assignee's interest in the Premises. Any such assignment shall only be effective if written notice thereof is given to the Consultant. No further or other assignment of this



Agreement shall be permitted.

25 *Delete clause if the law of England and Wales applies*

8S. ²⁵ The Purchaser/Tenant may assign or transfer the rights under this Agreement without the consent of the Consultant to another person (the 'First Assignee') who also takes an assignation of the Purchaser's/Tenant's whole interest in the Premises. The First Assignee may assign or transfer the rights under this Agreement without the consent of the Consultant to another person taking an assignation of the First Assignee's whole interest in the Premises. Any such assignation shall only be effective if written notice thereof is given to the Consultant in accordance with clause 9. No further or other assignation or transfer of this Agreement shall be permitted.

9. Any notice to be given by the Consultant shall be deemed to be duly given if it is delivered by hand or sent by recorded (signed for) or special delivery to the Purchaser/Tenant at the above mentioned address, its registered office or principal place of business for the time being; and any notice given by the Purchaser/Tenant shall be deemed to be duly given if it is delivered by hand or sent by recorded (signed for) or special delivery to the Consultant at the above mentioned address, its registered office or principal place of business for the time being. Any such notices, if sent by recorded (signed for) or special delivery, shall be deemed to have been received forty eight hours after being posted (subject to proof to the contrary).

26 *Insert period*

10. No action or proceedings for any breach of this Agreement shall be commenced against the Consultant after the expiry of ²⁶ years from the date of practical completion of the relevant part of the Premises under the Building Contract or, in the event that practical completion is not achieved, the date that the Consultant finishes its services under the Appointment.

27 *Delete clause if the law of Scotland applies*

11. ²⁷ Nothing in this Agreement confers or purports to confer on any third party any benefit or any right to enforce any term of this Agreement pursuant to the Contracts (Rights of Third Parties) Act 1999.

FOR USE WHERE THE APPLICABLE LAW IS THAT OF ENGLAND AND WALES

12. This Agreement is subject to the law of England and Wales and the parties hereto submit to the jurisdiction of the courts of England and Wales.

Where the Agreement is to be executed under hand and not as a deed

As witness the hands of the parties hereto

Signed by or on behalf of the Consultant

28 *Name and signature of person signing on behalf of Consultant*

.....
²⁸

Signed by or on behalf of the Purchaser/Tenant

29 *Name and signature of person signing on behalf of Purchaser/Tenant*

.....
²⁹



Where the Agreement is to be executed as a deed

In witness whereof the parties have executed this Agreement as a deed the day and year first before written

[WHERE THE CONSULTANT IS A SOLE PRACTITIONER OR PARTNERSHIP]

Signed as a deed by the Consultant

30 *Name and signature of sole practitioner or first partner*
30

31 *Name and signature of witness* in the presence of 31

32 *Address of witness* of
32

33 *Name and signature of additional partner* and by
33

in the presence of 31

32 of
32

and by
33

in the presence of 31

32 of
32

[WHERE THE CONSULTANT IS A LIMITED LIABILITY PARTNERSHIP OR COMPANY]

Executed as a deed by the Consultant

34 *Name and signature of member or director* by
34

35 *Name and signature of member or director or company secretary* and
35

[WHERE THE PURCHASER/TENANT IS AN INDIVIDUAL OR PARTNERSHIP]

Signed as a deed by the Purchaser/Tenant

36 *Name and signature of individual or first partners*
36

31 *Name and signature of witness* in the presence of 31

32 *Address of witness* of

33 *Name and signature of additional partner* and by

in the presence of 31

32 of

and by 33

in the presence of 31

32 of

and by 33

in the presence of 31

32 of

[WHERE THE PURCHASER/TENANT IS A LIMITED LIABILITY PARTNERSHIP OR COMPANY]

Executed as a deed by the Purchaser/Tenant

by 34

and 35

DRAWINGS

DESIGNER'S RISK ASSESSMENT

DESK STUDY INFORMATION

REVISION HISTORY RECORD SHEET

<u>Version No</u>	<u>Amendments Made</u>	<u>Date Approved</u>
1	Update of CRH standard specification to NBS format	1985
2	General revision incorporating more extensive requirements for establishing the presence of contaminants and to better define near surface soils	1992
3	Reformatted SI specification in accordance with 'Recommendations for the procurement of ground investigation' by CIRIA 1986	1992
4	Instructions to tenderers and contract year amended	1994
5	General revisions, update and reformatting	1998
6	Revised to incorporate Thomas Telford Specification for Ground Investigation with revisions	Sept 2005
7	General revisions and update	Oct 2005
8	General revisions and update	Nov 2006
9	Amendments to require AGS data 3.1 format data and complete ground gas measurement in accord with CIRIA C659. Also instructions to tenderers emphasise responsibility for services is with the contractor.	Jan 2007
9.1	Accommodate the role of CDM coordinator Clarify analysis for asbestos in soils TPH testing that relates to GAC	August 2007
9.2	Update to Schedule 4: Appendix 4, Ref 1.1	July 2008
9.3	Update to Schedule 4 with (1.1B) Waste Suites	January 2009
10	Updated to MS word format	August 2009
10.1	Updated with minor amendments to chemical suites and notes on asbestos	May 2010
10.2	Change BS 10175: 2001 to BS 10175: 2011	April 2011
11	Comprehensive review to provide an update for ICE UK Specification for Ground Investigation SISG 2012. Particular additional controls also added for Asbestos in Soils.	May 2011
12	General revisions and update	March 2014

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