# ANNEX 1 Bill of Quantities for Ground Investigation

**Preamble amendments and additions**

The following clauses are amended or added to the Preamble:

None

## Bill A General items, provisional services and additional items

| **Number** | **Item description** | **Unit** | **Quantity** | **Rate** | **Amount £** |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| **A** | **General items, provisional sums and additional items** |  |  |  |  |
| A1 | Offices and stores for the Contractor | sum | Not required |  |  |
| 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 | Not required |  |  |
| A4 | Maintain on site all site safety equipment for a Yellow Category site | week | Not required |  |  |
| A5 | Decontamination of equipment during and at end of intrusive investigation for a Yellow Category site | sum | Not required |  |  |
| A6 | Appropriate storage, transport and off- site disposal of contaminated arisings and any PPE equipment, excluding laboratory testing | provisional sum |  |  |  |
| A7 | Provide professional attendance in accordance with Clause 3.5.2 |  |  |  |  |
| A7.1 | Provide Technician | p.day | Not required |  |  |
| A7.2 | Provide Graduate Ground Engineer | p.day | Not required |  |  |
| A7.3 | Provide Experienced Ground Engineer | p.day | 8 |  |  |
| A7.4 | Provide Registered Ground Engineering Professional | p.day | Not required |  |  |
| A7.5 | Provide Registered Ground Engineering Specialist | p.day | Not required |  |  |
| A7.6 | Provide Registered Ground Engineering Advisor | p.day | Not required |  |  |
| 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 |  |  |
| A10 | Facilities for the Investigation Supervisor | sum | Not required |  |  |
| A11 | Vehicle(s) for the Investigation Supervisor | v.wk | Not required |  |  |
| A12 | Fuel for vehicle for the Investigation Supervisor | provisional sum | Not required |  |  |
| A13 | Investigation Supervisor's telephone and facsimile charges | provisional sum | Not required |  |  |
| A14 | Deliver selected cores and samples to the specified address | provisional sum | Not required |  |  |
| **Number** | **Item description** | **Unit** | **Quantity** | **Rate** | **Amount £** |
| A15 | Special testing and sampling required by Investigation Supervisor | provisional sum | Not required |  |  |
| A16 | Traffic safety and management | provisional sum | Not required |  |  |
| A17 | One master copy of the Desk Study Report | sum | Not required |  |  |
| A18 | Additional copies of the Desk Study Report | nr | Not required |  |  |
| A19 | One master copy of the Ground Investigation Report (or specified part thereof) | sum | 1 |  |  |
| A20 | Additional copies of the Ground Investigation Report (or specified part thereof) | nr | Not required |  |  |
| A21 | Electronic copy of Ground Investigation Report (or specified part thereof) | sum | 1 |  |  |
| A22 | One master copy of the Geotechnical Design Report (or specified part thereof) | sum | Not required |  |  |
| A23 | Additional copies of the Geotechnical Design Report (or specified part thereof) | nr | Not required |  |  |
| A24 | Electronic copy of Geotechnical Design Report in (or specified part thereof) | sum | Not required |  |  |
| A25 | Digital data in AGS transfer format | sum | 1 |  |  |
| A26 | Hard-copy photographs | nr | Not required |  |  |
| A27 | Photographic volume | nr | Not required |  |  |
| A28 | Long term storage of geotechnical samples (Appendix B) | provisional sum | Not required |  |  |
| A29 | Long term storage of geoenvironmental samples (Appendix B) | provisional sum | Not required |  |  |
|  | **Contract specific additional bill items** |  |  |  |  |
|  | None |  |  |  |  |
| Total section A carried to summary | | | | |  |
|  | | | | |  |

## Bill B Percussion Boring

| **Number** | **Item description** | **Unit** | **Quantity** | **Rate** | **Amount £** |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| **B** | **Percussion Boring** |  |  |  |  |
| B1 | Move boring plant and equipment to the site of each exploratory hole and set up | nr | Not required |  |  |
| B2 | Extra over Item BI for setting up on a slope of gradient greater than 20% | nr | Not required |  |  |
| B3 | Break out surface obstruction where present at exploratory borehole | h | Not required |  |  |
| B4 | Advance borehole between existing ground level and 10 m depth | m | Not required |  |  |
| B5 | As Item B4 but between 10 m and 20 m depth | m | Not required |  |  |
| B6 | As Item B4 but between 20 m and 30 m depth | m | Not required |  |  |
| B7 | As Item B4 but between 30 m and 40 m depth | m | Not required |  |  |
| B8 | As Item B4 but between 40 m and 50 m depth | m | Not required |  |  |
| B9 | Advance borehole through hard stratum or obstruction | h | Not required |  |  |
| B10 | Provide aquifer protection measures at a single aquiclude/aquifer boundary or cross contamination control measures at a single soil boundary in a borehole | nr | Not required |  |  |
| B11 | Backfill borehole with cement/bentonite grout or bentonite pellets | m | Not required |  |  |
| B12 | Standing time for borehole plant, equipment and crew | h | Not required |  |  |
|  | Dynamic sampling |  |  |  |  |
| B13 | Move dynamic sampling equipment to the site of each exploratory hole and set up | nr | 4 |  |  |
| B14 | Extra over Item BI3 for setting up on a slope of gradient greater than 20% | nr | 2 |  |  |
| B15 | Advance dynamic sample hole between existing ground level and 5 m depth | m | 20 |  |  |
| B16 | As Item B15 but between 5 m and 10 m depth | m | 20 |  |  |
| B17 | As Item B15 but between 10 m and **30 m** depth | m | 50 |  |  |
| B18 | Standing time for dynamic sampling equipment and crew | hr | Rate only |  |  |
| B19 | Provision of dynamic sampling equipment and crew for sampling as directed by the Investigation Supervisor; maximum depth 15 m | day | Not required |  |  |
| B20 | Backfill dynamic sampling hole with cement/bentonite grout or bentonite pellets | m | 90 |  |  |
|  | **Contract specific additional bill items** |  |  |  |  |
|  | None |  |  |  |  |
| Total section B carried to summary | | | | |  |

## Bill C Rotary Drilling

| **Number** | **Item description** | **Unit** | **Quantity** | **Rate** | **Amount £** |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| **C** | **Rotary drilling** |  |  |  |  |
|  | Hand augering |  | Not required |  |  |
|  | Continuous flight and hollow stem flight augering |  | Not required |  |  |
|  | Rotary drilling with and without core recovery |  |  |  |  |
| C15 | Move rotary drilling plant and equipment to the site of each exploratory drillhole and set up | nr | Included in B13 |  |  |
| C16 | Extra over Item C15 for setting up on a slope of gradient greater than 20% | nr | Included in B13 |  |  |
| C17 | Extra over Item C15 for setting up drilling plant for inclined drillhole | nr | Not required |  |  |
| C18 | Break out surface obstructions where present at exploratory drillhole | h | Not required |  |  |
| C19 | Standing time for rotary drilling plant, equipment and crew | h | Rate only |  |  |
| C20 | Provide aquifer protection measures at a single aquiclude/aquifer boundary in a drillhole | nr | Not required |  |  |
|  | Drilling without cores |  |  |  |  |
|  | Drilling to obtain cores |  |  |  |  |
| C34 | Rotary drill in materials other than hard strata to obtain cores of the specified diameter between existing ground level and 10 m depth | m | Not required |  |  |
| C35 | As Item C34 but between 10 m and 20 m depth | m | Rate only |  |  |
| C36 | As Item C34 but between 20 m and 30 m depth | m | Rate only |  |  |
| C37 | As Item C34 but between 30 m and 40 m depth | m | Not required |  |  |
| C38 | As Item C34 but between 40 m and 50 m depth | m | Not required |  |  |
| C39 | Extra over Items C34 to C38 for use of semi-rigid core liner | m | Rate only |  |  |
| C40 | Extra over Items C34 to C38 for coring inclined rotary drillhole | m | Not required |  |  |
| C41 | Rotary drill in hard strata to obtain cores of the specified diameter between existing ground level and 10 m depth | m | Not required |  |  |
| C42 | As Item C41 but between 10 m and 20 m depth | m | Rate only |  |  |
| C43 | As Item C41 but between 20 m and 30 m depth | m | 30 |  |  |
| C44 | As Item C41 but between 30 m and 40 m depth | m | Rate only |  |  |
| C45 | As Item C41 but between 40 m and 50 m depth | m | Not required |  |  |
| C46 | Extra over items C41 to C45 for use of semi-rigid liner | m | Not required |  |  |
| C47 | Extra over items C41 to C45 for coring inclined rotary drillhole | m | Not required |  |  |
| C48 | Backfill rotary drillhole with cement/bentonite grout or bentonite pellets | m | 30 |  |  |
| C49 | Core box to be retained by client | nr | Not required |  |  |
|  | Rotary percussive drilling |  | Not required |  |  |
|  | Resonance (sonic) drilling |  | Not required |  |  |
|  | Sonic drilling without cores |  | Not required |  |  |
|  | Sonic drilling to obtain cores |  | Not required |  |  |
|  | **Contract specific additional bill items** |  |  |  |  |
|  | None |  |  |  |  |
| Total section C carried to summary | | | | |  |

## Bill D Pitting and Trenching

| **Number** | **Item description** | **Unit** | **Quantity** | **Rate** | **Amount £** |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| **D** | **Pitting and trenching** |  |  |  |  |
|  | Inspection pits |  |  |  |  |
| D1 | Excavate inspection pit by hand to 1.2 m depth | nr | 14 |  |  |
| D2 | Extra over Item D1 for breaking out surface obstructions | h | Not required |  |  |
|  | Trial pits and trenches | nr | 8 |  |  |
|  | Observation pits and trenches |  | Not required |  |  |
|  | Daily provision of pitting crew and equipment |  | Not required |  |  |
|  | General |  | Not required |  |  |
|  | **Contract specific additional bill items** |  |  |  |  |
|  | None |  |  |  |  |
| 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** |  |  |  |  |
|  | Samples for geotechnical purposes |  |  |  |  |
| E1 | Small disturbed sample | nr | 128 |  |  |
| E2 | Bulk disturbed sample | nr | 28 |  |  |
| E3 | Large bulk disturbed sample | nr | Rate only |  |  |
| E4.1 | Open tube sample using thick-walled (OS-TK/W) sampler | nr | Rate only |  |  |
| E4.2 | Open tube sample using thin-walled (OS-T/W) sampler | nr | 20 |  |  |
| E5 | Piston sample | nr | 10 |  |  |
| E6 | Groundwater sample | nr | 4 |  |  |
| E7 | Ground gas sample | nr | Not required |  |  |
| E8 | Cut, prepare and protect core sub sample | nr | 28 |  |  |
|  | Continuous or semi-continuous sampling |  | Not required |  |  |
|  | Containers for contamination assessment and WAC testing |  |  |  |  |
| E14.1 | Provision of containers and collection of samples for contamination Suite E (S1.20.3) | nr | 52 |  |  |
| E14.2 | Provision of containers and collection of samples for contamination Suite F (S1.20.3) | nr | Rate only |  |  |
| E14.3 | Provision of containers and collection of samples for contamination Suite G (S1.20.3) | nr | Rate only |  |  |
| E15.1 | Provision of containers and collection of samples for WAC Suite H (S1.20.5) | nr | Not required |  |  |
| E15.2 | Provision of containers and collection of samples for WAC Suite I (S1.20.5) | nr | Not required |  |  |
| E15.3 | Provision of containers and collection of samples for WAC Suite J (S1.20.5) | nr | Not required |  |  |
|  | **Contract specific additional bill items** |  |  |  |  |
|  | None |  |  |  |  |
| Total section E carried to summary | | | | |  |

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| --- |
|  |

## Bill F Probing and cone penetration testing

| **Number** | **Item description** | **Unit** | **Quantity** | **Rate** | **Amount £** |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| **F** | **Probing and cone penetration testing** |  |  |  |  |
|  | Dynamic probing |  | Not required |  |  |
|  | Cone penetration testing |  |  |  |  |
| F8 | Bring static cone penetration test equipment to the site of each test location | nr | 10 |  |  |
| F9 | Extra over Item F8 for setting up on a slope of gradient greater than 20% | nr | Rate only |  |  |
| F10 | Carry out static cone penetration test measuring both cone and sleeve resistance from existing ground level to 10 m depth | m | 100 |  |  |
| F11 | As Item F10 but between 10 m and 20 m depth | m | 100 |  |  |
| F12 | As Item F10 but between 20 m and 30 m depth | m | Rate only |  |  |
| F13 | As Item F10 but between 30 m and 40 m depth | m | Not required |  |  |
| F14 | Extra over Items F10 to F13 for use of piezocone | m | 200 |  |  |
| F15 | Extra over Items F10 to F13 for interpretation of CPT/CPTU data | m | 200 |  |  |
| F16 | Carry out dissipation test up to 1-hour duration | nr | 4 |  |  |
| F17 | Extra over Item F16 for test duration exceeding 1 hour | h | Rate only |  |  |
| F18 | Standing time for static cone penetration test equipment and crew | h | Rate only |  |  |
| F19 | Extra over Items F10 to F13 for use of seismic cone | m | Not required |  |  |
| F20 | Carry out seismic cone test | nr | Not required |  |  |
| F21 | Extra over Item F20 for interpretation of seismic cone data | nr | Not required |  |  |
| F22 | Standing time for seismic cone test equipment and crew | h | Not required |  |  |
|  | **Contract specific additional bill items** |  |  |  |  |
|  | None |  |  |  |  |
| Total section F carried to summary | | | | |  |

## Bill G Geophysical testing

| **Number** | **Item description** | **Unit** | **Quantity** | **Rate** | **Amount £** |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| **G** | **Geophysical testing** |  |  |  |  |
|  | Land based mapping techniques |  | Not required |  |  |
|  | Land based profiling techniques |  | Not required |  |  |
|  | Land based borehole techniques |  | Not required |  |  |
|  | Overwater |  | Not required |  |  |
|  | **Contract specific additional bill items** |  |  |  |  |
|  | None |  |  |  |  |
| Total section G carried to summary | | | | |  |

## Bill H In situ testing

| **Number** | **Item description** | **Unit** | **Quantity** | **Rate** | **Amount £** |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| **H** | **In situ testing** |  |  |  |  |
| H1 | Standard penetration test in borehole | nr | 30 |  |  |
| H2 | Standard penetration test in rotary drillhole | nr | 24 |  |  |
| H3 | In situ density testing |  |  |  |  |
| H3.1 | Small pouring cylinder method | nr | Not required |  |  |
| H3.2 | Large pouring cylinder method | nr | Not required |  |  |
| H3.3 | Water replacement method | nr | Not required |  |  |
| H3.4 | Core cutter method | nr | Not required |  |  |
| H3.5 | Nuclear method | day | Not required |  |  |
| H4 | California Bearing Ratio test | nr | Not required |  |  |
| H5 | Vane shear strength test in borehole | nr | Not required |  |  |
| H6 | Penetration vane test, penetration from ground level | nr | Not required |  |  |
| H7 | Hand penetrometer test (set of 3 readings) | nr | Not required |  |  |
| H8 | Hand vane test (set of 3 readings) | nr | Rate only |  |  |
|  | Other tests |  | Not required |  |  |
|  | Permeability testing |  | Not required |  |  |
|  | Self-boring pressuremeter |  | Not required |  |  |
|  | High pressure dilatometer |  | Not required |  |  |
|  | Driven or push-in pressuremeter |  | Not required |  |  |
|  | Menard pressuremeter |  | Not required |  |  |
|  | Soil infiltration test |  | Not required |  |  |
|  | Miscellaneous site testing |  | Not required |  |  |
|  | **Contract specific additional bill items** |  |  |  |  |
|  | None |  |  |  |  |
| Total section H carried to summary | | | | |  |

## Bill I Instrumentation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Number** | **Item description** | **Unit** | **Quantity** | **Rate** | **Amount £** |
|  |  |  |  |  |  |
| **I** | **Instrumentation** |  |  |  |  |
|  | Standpipes and piezometers |  | Not required |  |  |
| I15 | Standpipe and piezometer development |  | Not required |  |  |
|  | Slip indicators |  | Not required |  |  |
|  | **Contract specific additional bill items** |  |  |  |  |
|  | None |  |  |  |  |
| 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) |  | Not required | |  |  |
|  | **Installation monitoring and sampling** (post Fieldwork Period) |  | Not required | |  |  |
|  | **Contract specific additional bill items** |  |  |  |  |  |
|  | None |  |  |  |  |  |
| Total section J carried to summary | | | | | |  |

## Bill K Geotechnical laboratory testing

| **Number** | **Item description** | **Unit** | **Quantity** | **Rate** | **Amount £** |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| **K** | **Geotechnical laboratory testing** |  |  |  |  |
| K1 | Classification |  |  |  |  |
| K1.1 | Moisture content | nr | 40 |  |  |
| K1.2 | Liquid limit, plastic limit and plasticity index | nr | 20 |  |  |
| K1.3 | Volumetric shrinkage | nr | Not required |  |  |
| K1.4 | Linear shrinkage | nr | Not required |  |  |
| K1.5 | Density by linear measurement | nr | Not required |  |  |
| K1.6 | Density by immersion in water or water displacement | nr | Not required |  |  |
| K1.7 | Dry density and saturation moisture content for chalk | nr | Not required |  |  |
| K1.8 | Particle density by gas jar or pyknometer | nr | Not required |  |  |
| K1.9 | Particle size distribution by wet sieving | nr | 8 |  |  |
| K1.10 | Particle size distribution by dry sieving | nr | Rate only |  |  |
| K1.11 | Sedimentation by pipette | nr | 8 |  |  |
| K1.12 | Sedimentation by hydrometer | nr | Rate only |  |  |
| K2 | Chemical and electrochemical |  |  |  |  |
| K2.1 | Organic matter content | nr | 8 |  |  |
| K2.2 | Mass loss on ignition | nr | Not required |  |  |
| K2.3 | Sulphate content of acid extract from soil | nr | Not required |  |  |
| K2.4 | Sulphate content of water extract from soil | nr | Not required |  |  |
| K2.5 | Sulphate content of groundwater | nr | Not required |  |  |
| K2.6 | Carbonate content by rapid titration | nr | Not required |  |  |
| K2.7 | Carbonate content by gravimetric method | nr | Not required |  |  |
| K2.8 | Water soluble chloride content | nr | Not required |  |  |
| K2.9 | Acid soluble chloride content | nr | Not required |  |  |
| K2.10 | Total Sulphur content | nr | Not required |  |  |
| K2.11 | Total dissolved solids | nr | Not required |  |  |
| K2.12 | pH value | nr | Not required |  |  |
| K2.13 | Resistivity | nr | Not required |  |  |
| K2.14 | Redox potential | nr | Not required |  |  |
| K3 | Compaction related |  |  |  |  |
| K3.1 | Dry density/moisture content relationship using 2.5 kg rammer | nr | 4 |  |  |
| K3.2 | Dry density/moisture content relationship using 4.5 kg rammer | nr | Not required |  |  |
| K3.3 | Dry density/moisture content relationship using vibrating rammer | nr | Not required |  |  |
| K3.4 | Extra over Items K3.1, K3.2 and K3.3 for use of CBR mould | nr | Not required |  |  |
| K.3.5 | Maximum and minimum dry density for granular soils | nr | Not required |  |  |
| K3.6 | Moisture Condition Value at natural moisture content | nr | Not required |  |  |
| K3.7 | Moisture Condition Value/moisture content relationship | nr | Not required |  |  |
| K3.8 | Chalk crushing value | nr | Not required |  |  |
| K3.9 | California Bearing Ratio on recompacted disturbed sample | nr | Not required |  |  |
| K3.10 | Extra over Item K3.9 for soaking | day | Not required |  |  |
| K4 | Compressibility, permeability, durability |  |  |  |  |
| K4.1 | One-dimensional consolidation properties, test period 5 days | nr | 6 |  |  |
| K4.2 | Extra over Item K4.1 for test period in excess of 5 days | day | 12 |  |  |
| K4.3 | Measurements of swelling pressure, test period 2 days | nr | Not required |  |  |
| K4.4 | Measurement of swelling, test period 2 days | nr | Not required |  |  |
| K4.5 | Measurement of settlement on saturation, test period 1 day | nr | Not required |  |  |
| K4.6 | Extra over Items K4.3 to K4.5 for test period in excess of 2 or 1 day (s) | day | Not required |  |  |
| K4.7 | Permeability by constant head method | nr | Not required |  |  |
| K4.8 | Dispersibility by pinhole method | nr | Not required |  |  |
| K4.9 | Dispersibility by crumb method | nr | Not required |  |  |
| K4.10 | Dispersibility by dispersion method | nr | Not required |  |  |
| K4.11 | Frost heave of soil | nr | Not required |  |  |
| K5 | Consolidation and permeability in hydraulic cells |  | Not required |  |  |
| K6 | Shear strength (total stress) |  |  |  |  |
| K6.1 | Shear strength by the laboratory vane method (set of 3) | nr | Not required |  |  |
| K6.2 | Shear strength by hand vane (set of 3) | nr | Not required |  |  |
| K6.3 | Shear strength by hand penetrometer (set of 3) | nr | Not required |  |  |
| K6.4 | Shear strength of a set of three 60 mm × 60 mm square specimens by direct shear, test duration not exceeding 1 day per specimen | nr | Not required |  |  |
| K6.5 | Extra over Item K6.4 for test durations in excess of 1 day per specimen | sp.day | Not required |  |  |
| K6.6 | Shear strength of a single 300 mm × 300 mm square specimen by direct shear, test duration not exceeding 1 day | nr | Rate only |  |  |
| K6.7 | Extra over Item K6.6 for test durations in excess of 1 day | day | Rate only |  |  |
| K6.8 | Residual shear strength of a set of three 60 mm × 60 mm square specimens by direct shear, test duration not exceeding 4 days per specimen | nr | Not required |  |  |
| K6.9 | Extra over Item K6.8 for test durations in excess of 4 days per specimen | sp.day | Not required |  |  |
| K6.10 | Residual shear strength of a 300 mm square specimen by direct shear, test duration not exceeding 4 days | nr | Not required |  |  |
| K6.11 | Extra over Item K6. 10 for test duration in excess day of 4 days | day | Not required |  |  |
| K6.12 | Residual shear strength using the small ring shear apparatus at three normal pressures, test duration not exceeding 4 days | nr | Not required |  |  |
| K6.13 | Extra over Item K6.12 for test duration in excess of 4 days | day | Not required |  |  |
| K6.14 | Unconfined compressive strength of 38 mm diameter specimen | nr | Not required |  |  |
| K6.15 | Undrained shear strength of a set of three 38 mm diameter specimens in triaxial compression without the measurement of pore pressure | nr | 10 |  |  |
| K6.16 | Undrained strength of a single 100 mm diameter specimen in triaxial compression without the measurement of pore pressure | nr | 10 |  |  |
| K6.17 | Undrained shear strength of single 100 mm diameter specimen in triaxial compression with multistage loading and without measurement of pore pressure | nr | Not required |  |  |
| K7 | Shear strength (effective stress) |  |  |  |  |
| K7.1 | Consolidated undrained triaxial compression test with measurement of pore pressure (set of three 38 mm specimens), test duration not exceeding 4 days per specimen | nr | Not required |  |  |
| K7.2 | As K7.1 but single-stage or multi-stage test using 100 mm diameter specimen | nr | Not required |  |  |
| K7.3 | Consolidated drained triaxial compression test with measurement of volume change (set of three 38 mm specimens), test duration not exceeding 4 days per specimen | nr | Not required |  |  |
| K7.4 | As Item K7.3 but single stage or multi stage test using 100 mm diameter specimen, test duration not exceeding 4 day | nr | 6 |  |  |
| K7.5 | Extra over Items K7.1 and K7.3 for test duration in excess of 4 days per specimen | sp.day | Not required |  |  |
| K7.6 | Extra over Items K7.2 and K7.4 for test duration in excess of 4 days | day | 12 |  |  |
| K8 | Rock testing |  |  |  |  |
| K8.1 | Natural water content of rock sample | nr | 10 |  |  |
| K8.2 | Porosity/density using saturation and calliper techniques | nr | Not required |  |  |
| K8.3 | Porosity/density using saturation and buoyancy | nr | Not required |  |  |
| K8.4 | Slake durability index | nr | Not required |  |  |
| K8.5 | Soundness by magnesium sulphate | nr | Not required |  |  |
| K8.6 | Magnesium sulphate test | nr | Not required |  |  |
| K8.7 | Shore scleroscope | nr | Not required |  |  |
| K8.8 | Schmidt rebound hardness | nr | Not required |  |  |
| K8.9 | Resistance to fragmentation | nr | Not required |  |  |
| K8.10 | Aggregate abrasion value | nr | Not required |  |  |
| K8.11 | Polished stone value | nr | Not required |  |  |
| K8.12 | Aggregate frost heave | nr | Not required |  |  |
| K8.13 | Resistance to freezing and thawing | nr | Not required |  |  |
| K8.14 | Uniaxial compressive strength | nr | 25 |  |  |
| K8.15 | Deformability in uniaxial compression | nr | Not required |  |  |
| K8.16 | Indirect tensile strength by Brazilian test | nr | Not required |  |  |
| K8.17 | Undrained triaxial compression without measurements of porewater pressure | nr | Not required |  |  |
| K8.18 | Undrained triaxial compression with measurement of porewater pressure | nr | Not required |  |  |
| K8.19 | Direct shear strength of a single specimen | nr | Not required |  |  |
| K8.20 | Swelling pressure test | nr | Not required |  |  |
| K8.21 | Measurement of point load strength index of rock specimen (set of ten individual determinations) | nr | Not required |  |  |
| K8.22 | Single measurement of point load strength on core sample (either axial or diametral test | nr | 50 |  |  |
|  | Ground/groundwater aggressivity |  |  |  |  |
| K9.1 | Suite A (Greenfield site – pyrite absent), Schedule 1.19.6 | nr | Not required |  |  |
| K9.2 | Suite B (Greenfield site – pyrite present) , Schedule 1.19.6 | nr | 20 |  |  |
| K9.3  K9.4 | Suite C (Brownfield site – pyrite absent) , Schedule 1.19.6  Suite D (Brownfield site – pyrite present), Schedule 1.19.6 | nr  nr | Not required |  |  |
|  | **Contract specific additional bill items** |  |  |  |  |
|  | None |  |  |  |  |
| Total section K carried to summary | | | | |  |

## Bill L Geoenvironmental laboratory testing

| **Number** | **Item description** | **Unit** | **Quantity** | **Rate** | **Amount £** |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| **L** | **Geoenvironmental laboratory testing** |  |  |  |  |
|  | Contamination testing |  |  |  |  |
| L1.1 | Suite E (Soil samples Schedule S1.20.3) | nr | 32 |  |  |
| L1.2 | Suite F (Water samples Schedule S1.20.3) | nr | Rate only |  |  |
| L1.3 | Suite G (Gas samples Schedule S1.20.3) | nr | Not required |  |  |
|  | Waste acceptance criteria testing |  |  |  |  |
| L2.1 | Suite H (Inert waste landfill Schedule S1.20.5) | nr | Not required |  |  |
| L2.2 | Suite I (Stable non-reactive hazardous waste in non-hazardous waste landfill Schedule S1.20.5) | nr | Not required |  |  |
| L2.3 | Suite J (Hazardous waste landfill Schedule S1.20.5) | nr | Not required |  |  |
|  | **Contract specific additional bill items** |  |  |  |  |
|  | None |  |  |  |  |
| Total section L carried to summary | | | | |  |

# Summary of Bill of Quantities

|  |  |  |
| --- | --- | --- |
|  |  | £ |
| A. | General items and provisional sums |  |
| B. | Percussion boring |  |
| C. | Rotary drilling |  |
| D. | Pitting and trenching |  |
| E. | Sampling 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 | |  |

CV of Supervising Engineer enclosed **Yes/No**

Method Statements enclosed **Yes/No**

**Signature…………………………………………………………………………………………...**

**Signed By…………………………………………………………………………………………..**

**On Behalf of (Company)…………………………………………………………………………**

**Date………………………………………………………………………………………………….**

## Appendix A. Rates for Ground Practitioners and other Personnel

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Item Description | Unit | Rate |
| 1 | Technician | h |  |
| 2 | Graduate ground engineer | h |  |
| 3 | Experienced ground engineer | h |  |
| 4 | Registered Ground Engineering Professional | h |  |
| 5 | Registered Ground Engineering Specialist | h |  |
| 6 | Registered Ground Engineering Advisor | h |  |
| 7 | Expenses incurred by staff on site visits who are resident by agreement with the Investigation Supervisor | day |  |
| 8 | Rate per kilometer1 from Contractor’s premises and return for Items 1, 2 and 3 | km1 |  |
| 9 | As above but for Items 4, 5 and 6 | km1 |  |
| 10 | 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 |  |
| 11 | As above but for Items 4, 5 and 6 | visit |  |
| 12 | All other expenses incurred in connection with a visit where an overnight stay is necessary for Items 1, 2 and 3 | overnight |  |
| 13 | As above but for Items 4, 5 and 6 | overnight |  |
| 1 where considered more appropriate, ‘mile’ may be used | |  |  |

Estimate of costs under Appendix A to the Bill of Quantities where the provision of the Contractor’s staff for work in accordance with Specification Clauses 3.5.2, 3.6.1 and 3.6.2 cannot be adequately specified at tender. **(To be assessed by the Investigation Supervisor)**

## Appendix B. Long-term sample storage

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Item Description | Unit | Rate |
| **Geotechnical Samples** | |  |  |
| 1 | Dynamic (windowless) samples | nr |  |
| 2 | Rotary drilling core in core box | nr |  |
| 3 | Rotary drilling core sub-samples | nr |  |
| 4 | Bulk samples | nr |  |
| 5 | Large bulk samples | nr |  |
| 6 | Open-tube samples (thick-wall sampler) | nr |  |
| 7 | Open-tube samples (thin-wall sampler) | nr |  |
| 8 | Disturbed samples | nr |  |
| 9 | Groundwater samples | nr |  |
| 10 | Delft samples | nr |  |
| 11 | Mostap samples | nr |  |
| 12 | Piston Samples | nr |  |
| **Contamination Samples** | | nr |  |
| 13 | Soil samples in plastic tubs | nr |  |
| 14 | Soil samples in glass containers | nr |  |
| 15 | Groundwater samples | nr |  |
| 16 | Gas samples | nr |  |
| Where samples comprise more than one container, the rate entered shall be per container | |  |  |

Estimate of costs under Appendix B to the Bill of Quantities for long-term storage of samples where required in S1.12.2 and S1.12.10. **(To be assessed by the Investigation Supervisor)**