

d) Delays due to installation

13. The rates for recording of water level or gas measurement shall allow for notices of re-entry to the Engineer, owners or occupiers affected by the location or access route.

14. Table A to the Bill of Quantities (Rates for geotechnical and other personnel shall be priced).

The rates given will be used by the Engineer to make an initial estimate of costs where applicable of employing the Contractor's staff in accordance with Clause 3.13 of the Specification.

Units of Measurement

16. The following abbreviations shall be used for the unit

Millimeters
Metre
Kilometers
Square millimeters
Square metre
Cubic metre
Square meter per day
Kilogram
Tonne
Sum
Number
Hour
Week
Vehicle week
Item

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
A	General items and provisional sums					
A1	Offices and stores for the Contractor	1	Sum			
A2	Establish on site all plant, equipment and services including safety and protective equipment	1	Sum			
A4	Establish the location and elevation of the ground at each exploratory hole	1	Sum			
A5	Facilities for the Engineer	1	Sum			
A12	One master copy of the Interpretive report	1	Sum			
A13	Additional copies of the Interpretive report	4	Nr			
A16	Digital data	1	Sum			
A17	Photograph	24	Nr			
A18	Provision of Safety Plan	1	Nr			
A19	Heras Fencing	Rate only	Sum			
A20	Skips	1	Sum			
A21	Provision of a Geotechnical and Geological supervision and administration of the contract	1	Sum			
A22	Provision of hygiene and other facilities as appropriate to BDA 'Yellow' classification	1	Sum			
A23	Maintenance of hygiene and other facilities as appropriate to BDA 'Yellow' classification	1	Sum			
A24	Provision and maintenance of dipmeter for use of Engineer during the contract period.	1	Sum			
A25	Reinstatement of surfacings	1	Sum			
A26	Liaising with the Client	1	Sum			
A26i	Liaising with the client to comply with the Permit to Dig System	1	Sum			
A27	Confirm absence of underground services at exploratory hole positions.	1	Sum			
A28	Magnetometer survey and UXO awareness briefing	1	Sum			
Total, Section A carried to Summary						



ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
B	Boreholes					
B1	Move boring plant and equipment to the site of each exploratory hole and set up	2	Nr			
B2	Extra over Item B1 for setting up on a slope of gradient greater than 20%	Rate only	Nr			
B4	Advance borehole between existing ground level and 10m depth	20	m			
B5	As Item B4 but between 10m and 20m depth	20	m			
B6	As Item B4 but between 20m and 30m depth	20	m			
B7	As Item B4 but between 30m and 40m depth	10	m			
B8	As Item B4 but between 40m and 50m depth	5	m			
B9	Advance borehole through hard stratum or obstruction	4	h			
B10	Backfill borehole with cement/bentonite grout (for holes without installations)	Rate only	m			
B11	Standing time for borehole plant, equipment and crew	4	h			
B100	Concrete coring at all window sample and borehole locations	1	Sum			
B101	Move window sampling equipment to the site of each exploratory hole and set up	2	nr			
B102	Advance window sample borehole between existing ground level and 10m depth	10	m			
B103	Reinstatement to match existing standard (around metal flush cover) at cable percussion borehole location	2	Nr			
Total, Section B carried to Summary						

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
C	Rotary Drilling NOT REQUIRED					
Total, Section c carried to Summary						

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
D	Pits and Trenches					
D1	Excavate inspection pit by hand to 1.2m depth	2	nr			
D2	Extra over Item D1 for breaking out surface obstructions	2	h			
	Trial pits and trenches					
D3	Move equipment to the site of each trial pit or trench	4	nr			
D4	Excavate trial pit between existing ground level and 3.0m depth	12	m			
D5	As item D4 but between 3.0 and 4.5m depth.	6.0	m			
D10	Extra items D4 and D5 for breaking out hard strata or surface obstructions	4	hr			
D11	Standing time for excavation of plant, equipment and crew of machine dug trial pit or trench	6	hr			
D12	Reinstatement of trial pit location to as found condition	4	No.			
Total, Section D carried to Summary						

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
E	Sampling					
E1	Small disturbed sample	200	Nr			
E2	Bulk disturbed sample	30	Nr			
E3	Large bulk disturbed sample	15	Nr			
E4	Open tube sample	40	Nr			
E6	Groundwater sample	4	Nr			
E7	Contamination Sample - Soils	20	Nr			
E8	Contamination Sample - Water	3	Nr			
Total, Section E carried to Summary						

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
F	In Situ Testing					
F1	Standard penetration test in borehole	40	Nr			
F11	Carry out permeability test in borehole	Rate only	hr			
F11.1	Carry out permeability test in trial pit	Rate only	hr			
Total, Section F carried to Summary						

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
G	Instrumentation and Monitoring					
	Standpipes and Piezometers					
G1	Backfill exploratory hole with cement/bentonite grout above and below standpipe or standpipe piezometer	50	m			
G1.1	Provide bentonite seal above and below standpipe or standpipe piezometer	8	m			
G3	50mm Standpipe with geo sock or similar	8	m			
G4	Standpipe piezometer	65	m			
G5	Provide filter medium	10	m			
G7	Provide piezometer tip	2	Nr			
G8	Protective cover (flush)	2	Nr			
G11	Reading of water level in standpipe, or standpipe piezometer during fieldwork period	2	Nr			
G11a	Reading of water level in standpipe, or standpipe piezometer post fieldwork period	8	Nr			
G12	Gas measurement in gas monitoring standpipe during field work period	2	Nr			
G12a	Gas measurement in gas monitoring standpipe during field work period	8	Nr			
Total, Section G carried to Summary						

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
H	Laboratory Testing					
H1						
H1.1	Moisture content	30	Nr			
H1.2	Liquid limit, plastic limit and plasticity index	10	Nr			
H1.7	Dry density and saturation moisture content for chalk	Rate only	Nr			
H1.9	Particle size distribution by wet sieving	8	Nr			
H1.12	Sedimentation by hydrometer	3	Nr			
H2	Chemical and electrochemical					
H2.1	Organic matter content	3	Nr			
H2.4	Sulphate content of water extract from soil (2:1 soil water extract)	10	Nr			
H2.8	Water soluble chloride content	Rate only	Nr			
H2.12	pH value	10	Nr			
H2.13	Nitrate (2:1 soil/water extract)	Rate only	Nr			
H2.15	Magnesium (2:1 soil/water extract)	Rate only	Nr			
H3	Compaction Related					
H3.9	California Bearing Ratio on recompacted disturbed sample	5	Nr			
H4	Compressibility, permeability, durability					
H4.1	One-dimensional consolidation properties, test period 5 days	5	Nr			
H4.2	Extra over Item H4.1 for test period in excess of 5 days	20	Day			
Page Total, Section H, carried forward						

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
H	Laboratory Testing (continued)					
H6	Shear Strength (total stress)					
H6.6	Shear strength of a single 300mm x 300mm square specimen by direct shear, test duration not exceeding 1 day	Rate only	Nr			
H6.16	Undrained strength of a single 100mm diameter specimen in triaxial compression without the measurement of pore pressure	40	Nr			
H7	Shear Strength (effective stress)					
H7.1	Consolidated undrained triaxial compression test with measurement of pore pressure (set of three 38mm specimens), test duration not exceeding 4 days per specimen	Rate only	Nr			
H7.2	As H7.1 but single-stage or multi-stage test using 100mm diameter specimen	Rate only	Nr			
H7.6	Extra over Items H7.2 for test duration in excess of 4 days	Rate only	Day			
H8	Rock testing					
H8.1	Natural water content of rock sample	Rate only	Nr			
H8.21	Determination of point load strength of rock specimen	Rate only	Nr			
H8.22	Unconfined Compressive Strength	Rate only	Nr			
				Page total		
				Brought forward page		
Total, Section H carried to Summary						



ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
I	Chemical Testing for Contaminated Ground					
I1	Soil samples - primary contaminants					
I1.1	Arsenic - total	8	Nr			
I1.2	Cadmium - total	8	Nr			
I1.3	Chromium - total	8	Nr			
I1.4	Chromium - hexavalent	-	Nr			
I1.5	Lead - total	8	Nr			
I1.6	Mercury - total	8	Nr			
I1.7	Selenium - total	8	Nr			
I1.8	Boron - water soluble	8	Nr			
I1.9	Copper - total	8	Nr			
I1.10	Nickel - total	8	Nr			
I1.11	Zinc - total	8	Nr			
I1.12	Cyanide - total	8	Nr			
I1.13	Cyanide - complex	-	Nr			
I1.14	Cyanide -free	-	Nr			
I1.15	Thiocyanate	-	Nr			
I1.16	Phenols - total	8	Nr			
I1.17	Sulphide	-	Nr			
I1.18	Sulphate -total, acid soluble	8	Nr			

Page Total, Section I, carried forward

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ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
I	Chemical Testing for Contaminated Ground (Continued)					
I1.19	Sulphate - water soluble, 2:1 extract	8	Nr			
I1.20	Sulphur -free	8	Nr			
I1.21	pH value	8	Nr			
I1.22	Toluene extractable matter	-	Nr			
I1.23	Coal tar/polyaromatic hydrocarbon	8	Nr			
I1.24	Asbestos	8	Nr			
I1.25	Total Petroleum Hydrocarbon	8	Nr			
I2	Soil samples - secondary contaminants					
I2.1	USEPA 16 PAH analysis	8	Nr			
I2.2	TPH as diesel range organics and mineral oils	8	Nr			
I2.3	Gasoline/petrol range organics including BTEX/MBTE	8	Nr			
I2.4	VOC's including BTEX/MTBE and chlorinated solvents by GCMS	8	Nr			
I2.5	SVOC's by GCMS (full scan)	8	Nr			
I2.8	Chloride	-	Nr			
I3	Water samples					
I3.1	Arsenic	4	Nr			
I3.2	Cadmium	4	Nr			
I3.3	Chromium - total	4	Nr			
I3.4	Chromium - hexavalent	-	Nr			

Page Total, Section I, carried forward



ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
I	Chemical Testing for Contaminated Ground (Continued)					
I3.5	Lead total	4	Nr			
I3.6	Mercury total	4	Nr			
I3.7	Selenium total	4	Nr			
I3.8	Boron - water soluble	4	Nr			
I3.9	Copper total	4	Nr			
I3.10	Nickel total	4	Nr			
I3.11	Zinc total	4	Nr			
I3.12	Cyanide - total	4	Nr			
I3.13	Cyanide - complex	-	Nr			
I3.14	Cyanide - free	-	Nr			
I3.15	Thiocyanate	-	Nr			
I3.16	Phenols - total	4	Nr			
I3.17	Sulphide	-	Nr			
I3.18	Sulphate	4	Nr			
I3.19	Sulphur - free	-	Nr			
I3.20	pH value	4	Nr			
I3.21	Polyaromatic hydrocarbons	4	Nr			
I3.22	Antimony	-	Nr			
I3.23	Barium	-	Nr			

Page Total, Section I, carried forward

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ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
I	Chemical Testing for Contaminated Ground (Continued)					
13.24	Beryllium	-	Nr			
13.25	Vanadium chloride	-	Nr			
13.26	Chloride	-	Nr			
13.27	Ammoniacal nitrogen	-	Nr			
13.28	Nitrate - nitrogen	-	Nr			
13.29	Chemical oxygen demand	-	Nr			
13.30	Biochemical oxygen demand	-	Nr			
13.31	Total organic carbon	-	Nr			
13.32	Volatile fatty acids	-	Nr			
13.33	Iron	-	Nr			
13.34	USEPA 16 PAH analysis	4	Nr			
13.35	TPH as diesel range organics and mineral oils	4	Nr			
13.36	Gasoline/petrol range organics including BTEX/MBTE	4	Nr			
13.37	VOC's including BTEX/MTBE and chlorinated solvents by GCMS	4	Nr			
13.38	SVOC's by GCMS (full scan)	4	Nr			
I4	Gas samples					
14.1	Carbon dioxide	Rate only	Nr			
14.2	Hydrogen	Rate only	Nr			
14.3	Hydrogen sulphide	Rate only	Nr			

Page Total, Section I, carried forward

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ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	
					£	p
I	Chemical Testing for Contaminated Ground (Continued)					
14.4	Methane	Rate only	Nr			
14.5	Nitrogen	Rate only	Nr			
14.6	Oxygen	Rate only	Nr			
14.7	Ethane	Rate only	Nr			
14.8	Propane	Rate only	Nr			
14.9	Carbon monoxide	Rate only	Nr			
12.9	Waste Acceptance Criteria Testing Inert suite	Rate only	Nr	4		
12.10	Waste Acceptance Criteria Testing Hazardous suite	Rate only	Nr	4		
				Page total		
				Brought forward page		
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				Brought forward page		
				Brought forward page		
Total Section I Carried to Summary						



Summary of Bill of Quantities

	£
A General items and provisional sums	
B Boreholes	
C Rotary drilling	
D Pits and trenches	
E Sampling	
F In situ testing	
G Instrumentation and monitoring	
H Laboratory testing	
I Chemical testing for contaminated ground	
Total tender	



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 in the preparation of any interpretative and advisory sections of the report, or employed for advisory work for the Engineer on site on the conduct of the investigation, in accordance with Specification Clause 3.13 and Schedule 1. 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)






Item	Item description	Unit	Rate
			£
1	Technician	h	
2	Incorporated Engineer	h	
3	Graduate Engineer/Geologist/ Environmental Scientist	h	
4	Graduate Engineer/Geologist/ Environmental Specialist with at least 3 years of relevant experience since graduation	h	
5	Chartered Engineer/ Geologist/ Environmental Specialist with at least 5 years of relevant experience	h	
6	Principal Chartered Engineer/Geologist/ Environmental Specialist with at least 10 years of relevant experience	h	
7	Fare per mile from Contractor's premises and return for Items 1, 2 and 3	mile	
8	As above but for Items 4, 5 and 6	mile	
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	

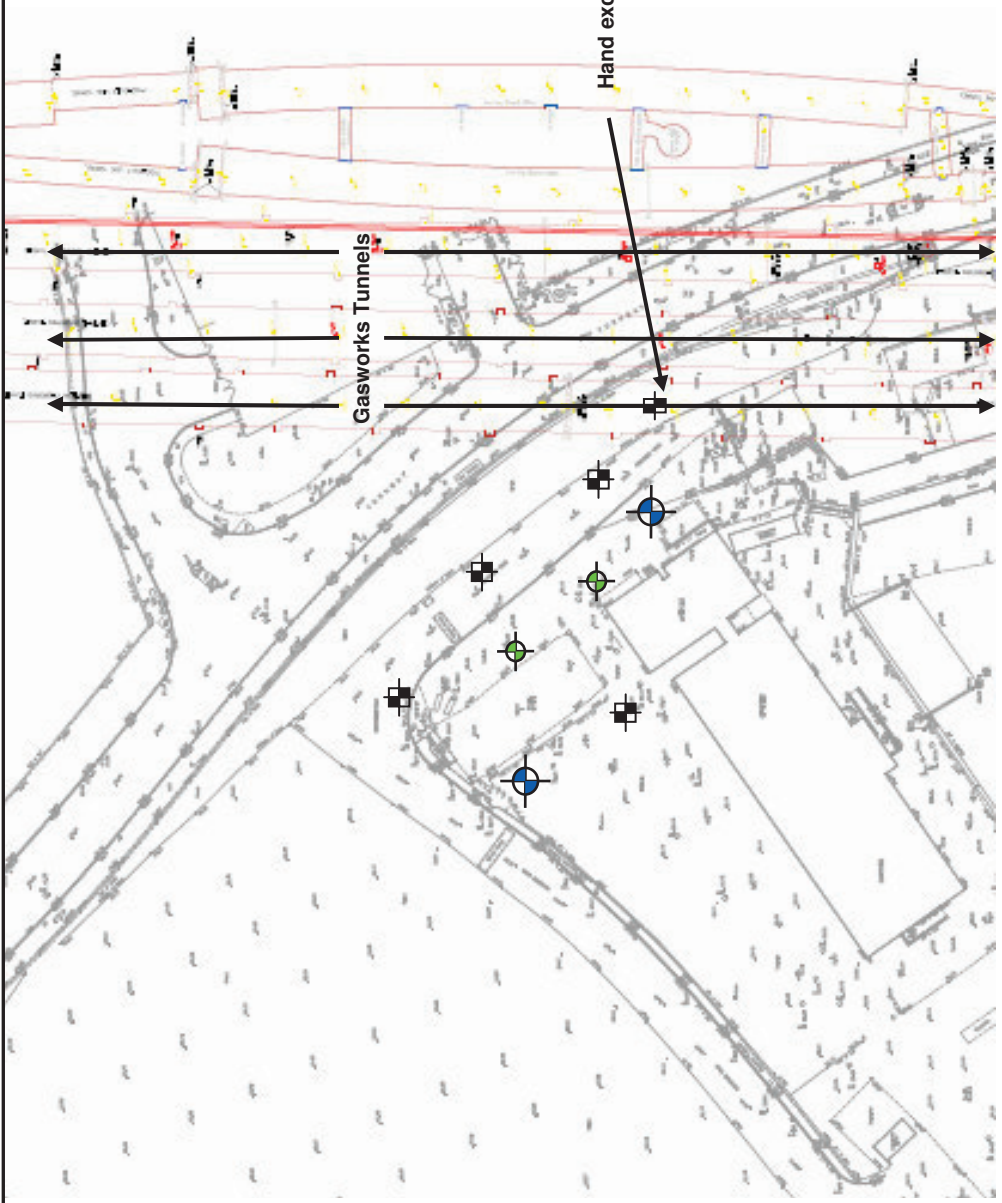



Appendix B. Figures



-  Trial Pit
-  Borehole
-  Window Sample

Note: Exploratory hole positions to be finalised following meeting on site to minimise disruption etc to the site.



 WSP Environment & Energy		WSP House, 70 Chancery Lane London WC2A 1AF Tel: 0207 314 5000 Fax: 0207 314 5111	
		Project No. 12041448-004 Client Carillion Project Kings Cross Block R4 Title Exploratory Hole Location Plan	Date 30/03/09 Figure No. Figure 1 Drawn by SS Checked by MS

**APPENDIX E: KINGS CROSS BUILDING R5 GROUND CONTAMINATION
INTERPRETATIVE REPORT, SEPTEMBER 2010**