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John Foster  
Taylor Wimpey North East Ltd  
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North House  
Wessington Way  
Sunderland  
SR5 3RL

23<sup>rd</sup> April 2015

Ref: C4220B/5873/DCB

Dear John,

**Re: C4220B – Monkton Fell, South Tyneside – Additional Geotechnical and Contamination Testing**

### **Introduction**

Further to the completion of our geoenvironmental appraisal report (Ref C4220A dated September 2011) for the above site, Sirius have carried out an additional phase of sampling and analysis of soils present on site. These works have been undertaken as detailed within our additional quotation dated 20<sup>th</sup> March 2015 on behalf of Taylor Wimpey (North East) Ltd and Barrat Homes (North East) Ltd. The purpose of the additional sampling is to provide further detail on ground conditions and the suitability of the material found on site for use within a residential development scenario and to identify the contamination status of these materials.

### **Additional Fieldwork**

Additional fieldwork was carried out on the 1<sup>st</sup> and 2<sup>nd</sup> April 2015 and comprised the excavation of 17No. trial pits (TP50 to TP68 excluding TP64) within the proposed Phase II portion of Taylor Wimpey and Barratt Homes development located to the south of Monkton Lane (Fields 3 and 4). Trial pits were excavated to a maximum depth of 3.5m bgl. Samples were obtained on a systematic basis from varying depths within the material and were subject to laboratory analysis for the suite of contaminants as listed in Table 1 below. In addition to a standard suite of potential contaminants analysis for Hydrocarbons, PAHs, Cyanide and Phenols was carried out in order to assess the potential for historic contamination associated with the former Monkton Coke Works Site.

The locations of exploratory holes are shown on Drawing C4220B/02. Ground conditions are summarised on the trial pit logs appended to this correspondence. In summary, all of the

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exploratory holes were found to contain dark brown sandy gravelly topsoil of between 0.2 and 0.3m in thickness underlain by stiff medium to high strength brown mottled grey sandy gravelly clay up to 3.5m bgl. Ground conditions were found to be consistent with those encountered during previous phases of investigation. Glacial till was found to be of medium to high strength which is consistent with the findings of the previous phase of investigation.

### Results of Chemical Analysis

The results of additional chemical analysis are summarised in Table 1 below. Concentrations of contaminants have been assessed against Sirius' tier 1 assessment criteria for a residential with plant uptake end use.

**Table 1 Summary of Total Soil Concentrations – Stockpiled Clay Fill**

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (2.5% SOM)	No. of Samples >GAC	Comments
<b>Metals</b>					
Inorganic Arsenic	6	13 – 20	37	0	
Cadmium	6	0.6 – 0.8	18	0	
Chromium (III)	6	34 – 50	4000	0	
Lead	6	100 – 140	200*	0	
Inorganic Mercury	6	0.12 – 0.23	170	0	
Selenium	6	<0.5 – 0.8	350	0	
Copper	6	41 – 83	200	0	
Nickel	6	20 – 29	180	0	
Zinc	6	98 – 150	450	0	
<b>Inorganics</b>					
pH	6	6.1 – 7.3	<5	0	
Water Sol. Sulphate	6	0.019 – 0.110	0.5 g/l	0	
Cyanide	6	<0.1 – 3.3	34	0	
<b>Speciated PAH</b>					
Acenaphthene	12	<0.1 – 0.4	490	0	
Anthracene	12	<0.1 – 0.2	5300	0	
Acenaphthylene	12	<0.1 – 0.5	400	0	
Benzo(a)anthracene	12	<0.1	11	0	
Benzo(b)fluoranthene	12	<0.1	3.3	0	
Benzo(k)fluoranthene	12	<0.1	93	0	
Benzo(g,h,i)perylene	12	<0.1 – 6.0	340	0	
Benzo(a)pyrene	12	<0.1	2.7	0	
Chrysene	12	<0.1	22	0	
Dibenzo(a,h)anthracene	12	<0.1 – 1.5	0.28	1	TP68, 0.1m



Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (2.5% SOM)	No. of Samples >GAC	Comments
Fluoranthene	12	<0.1 – 1.1	5300	0	
Fluorene	12	<0.1 – 0.3	560	0	
Indeno(1,2,3-cd)pyrene	12	<0.1 – 3.6	36	0	
Naphthalene	12	<0.1 – 2.3	2.3	0	
Pyrene	12	<0.1 – 0.6	1200	0	
Phenanthrene	12	<0.1 – 0.3	220	0	
<b>Others</b>					
Phenol	6	<0.3 – 0.5	550	0	
TOC	6	4.6 – 14	3 w/w%	6	
Asbestos	0	N/A	Fibres present	0	

\*based on c4sl for lead

Table based on a Residential with Gardens end use.

US95 - 95<sup>th</sup> percentile estimate of the mean value; GAC -generic assessment criterion; NA - not applicable.

**Table 1A Hydrocarbon Analysis**

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (2.5% SOM)	No. of Samples >GAC	Comments
Aliphatic EC 5-6	6	<0.01	40	0	
Aliphatic EC >6-8	6	<0.01	110	0	
Aliphatic EC >8-10	6	<0.01	30	0	
Aliphatic EC >10-12	6	<1.5	150	0	
Aliphatic EC >12-16	6	<1.2	1200	0	
Aliphatic EC >16-35	6	<3.4	69000	0	
Aromatic EC 5-7	6	<0.01	0.27	0	
Aromatic EC >7-8	6	<0.01	240	0	
Aromatic EC >8-10	6	<0.01	47	0	
Aromatic EC >10-12	6	<0.9	150	0	
Aromatic EC >12-16	6	<0.5	1200	0	
Aromatic EC >16-21	6	<0.6	540	0	
Aromatic EC >21-35	6	<1.4	1500	0	

Table based on a Residential with Gardens end use.

US95 - 95<sup>th</sup> percentile estimate of the mean value; GAC -generic assessment criterion; NA - not applicable.



The additional results obtained from the Phase II area indicate that with the exception of a single PAH concentration detected in TP68, all determinands are present at concentrations below tier 1 assessment criteria for a residential garden end use.

## **Conclusions**

### *Geotechnical*

Additional exploratory positions have been advanced resulting in an overall frequency of investigation on an approximate fifty meter grid. Ground conditions have been found to be consistent with previous phase of investigation and consequently it can be confirmed that geotechnical recommendations are unchanged from those detailed within the previous geoenvironmental appraisal report.

### *Ground Contamination*

Following the generic quantitative assessment of results summarised in Table 1 above it is concluded that soils on site do not generally contain concentrations of contaminants which could present a potential risk to future site end users.

No visual, olfactory or chemical evidence of contamination originating from the historic cokeworks formerly located to the east of the site has been identified.

A single detected concentration of the PAH Dibenzo(ah) anthracene was detected at a concentration above the tier 1 assessment criteria in TP68 within shallow soil (0.1m bgl). The concentration is not associated with any obvious source of contamination and is not consistent with other results obtained from the topsoil on site. At this stage it is considered that this result is representative of anomaly which could possibly have been caused by inclusion of organic material within the sample or other cross contamination and is not representative of the nature of the topsoil in this area. It is recommended that prior to stripping of topsoil in this area of the site, additional shallow soil samples are obtained and analysed for speciated PAHs only in order to determine with greater confidence typical levels of PAHs in this area of the site.

With the exception of the localised area around TP68 which will be subject to further assessment it is considered that the site topsoil would be suitable for re-use within private gardens.

Six samples returned concentrations of TOC above the GAC. TOC is a measure of organic carbon within the material, and it is therefore not unexpected for cohesive made ground noted to contain organic debris to exhibit elevated TOC concentrations. TOC is not a determinand which directly poses a risk to human health. These results are used to determine the classification of material for removal from site to a licensed disposal facility. The TOC is also used to derive the relevant SOM for the soils, necessary to derive an appropriate GAC for other parameters sensitive to organic matters.



We trust that the above is sufficient for your present requirements. However, please do not hesitate to contact the undersigned should you wish to discuss the findings in further detail.

Yours sincerely

David Brooks  
Principal Engineer

For and on behalf of

**Sirius Geotechnical and Environmental Ltd**

Encs: DETS Lab certificate 15-32268.  
Exploratory Hole Location Plan.  
Trial Pit Logs TP50 to TP68 (excluding TP64).



## Certificate of Analysis

Certificate Number 15-32268

23-Apr-15

*Client* Sirius Geotechnical & Environmental  
Russel House  
Suite 2  
Mill Road  
Langley Moor  
DH7 8HJ

*Our Reference* 15-32268

*Client Reference* C4220B

*Contract Title* Monkton Fell, Hebburn

*Description* 12 Soil samples.

*Date Received* 14-Apr-15

*Date Started* 14-Apr-15

*Date Completed* 23-Apr-15

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

*Approved By*

A handwritten signature in black ink, appearing to read "Rob Brown".

Rob Brown  
Business Manager



## Summary of Chemical Analysis

### Matrix Descriptions

*Our Ref* 15-32268

*Client Ref* C4220B

*Contract Title* Monkton Fell, Hebburn

Sample ID	Depth	Lab No	Completed	Matrix Description
TP51	0.1	796943	23/04/2015	Dark grey, gravelly, sandy CLAY including odd rootlets
TP53	0.1	796944	23/04/2015	Dark grey, gravelly, sandy CLAY including odd rootlets
TP53	0.5	796945	23/04/2015	Brown, gravelly, sandy CLAY including numerous rootlets
TP57	0.1	796946	23/04/2015	Dark brown, gravelly, sandy CLAY including numerous rootlets
TP59	0.1	796947	23/04/2015	Dark brown, gravelly, sandy CLAY including numerous rootlets
TP59	1	796948	23/04/2015	Brown, gravelly, sandy CLAY
TP60	0.1	796949	23/04/2015	Dark grey, gravelly, sandy CLAY including odd rootlets (Made ground - glass)
TP62	0.1	796950	23/04/2015	Dark grey, gravelly, sandy CLAY including odd rootlets
TP62	0.5	796951	23/04/2015	Brown, gravelly, sandy CLAY
TP66	0.1	796952	23/04/2015	Dark grey, gravelly, sandy CLAY including odd rootlets
TP66	0.6	796953	23/04/2015	Brown, gravelly, sandy CLAY including odd rootlets
TP68	0.1	796954	23/04/2015	Dark grey, gravelly, sandy CLAY including numerous rootlets

# Summary of Chemical Analysis

## Soil Samples

Our Ref 15-32268

Client Ref C4220B

Contract Title Monkton Fell, Hebburn

Lab No	796943	796944	796945	796946	796947	796948
Sample ID	TP51	TP53	TP53	TP57	TP59	TP59
Depth	0.10	0.10	0.50	0.10	0.10	1.00
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	02/04/15	02/04/15	02/04/15	02/04/15	02/04/15	02/04/15
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
<b>Metals</b>								
Arsenic	DETSC 2301#	0.2	mg/kg	18			13	18
Cadmium	DETSC 2301#	0.1	mg/kg	0.7			0.6	0.7
Chromium	DETSC 2301#	0.15	mg/kg	44			34	37
Copper	DETSC 2301#	0.2	mg/kg	64			41	50
Lead	DETSC 2301#	0.3	mg/kg	130			100	110
Mercury	DETSC 2325#	0.05	mg/kg	0.17			0.14	0.16
Nickel	DETSC 2301#	1	mg/kg	29			20	21
Selenium	DETSC 2301#	0.5	mg/kg	0.7			< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	130			110	140
<b>Inorganics</b>								
pH	DETSC 2008#			7.0			6.7	6.8
Cyanide Total	DETSC 2130#	0.1	mg/kg		0.3	< 0.1		0.2
Total Organic Carbon	DETSC 2002	0.1	%	5.5			6.0	6.8
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	42			19	89
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.10			0.08	0.09
<b>Petroleum Hydrocarbons</b>								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01		< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01		< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01		< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg		< 1.5	< 1.5		< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg		< 1.2	< 1.2		< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg		< 1.5	< 1.5		< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg		< 3.4	< 3.4		< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg		< 10	< 10		< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01		< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01		< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01		< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg		< 0.9	< 0.9		< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg		< 0.5	< 0.5		< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg		< 0.6	< 0.6		< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg		< 1.4	< 1.4		< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg		< 10	< 10		< 10
TPH Ali/Aro	DETSC 3072*	10	mg/kg		< 10	< 10		< 10
Benzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01		< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01		< 0.01
Toluene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01		< 0.01
Xylene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01		< 0.01
MTBE	DETSC 3321	0.01	mg/kg		< 0.01	< 0.01		< 0.01



# Summary of Chemical Analysis

## Soil Samples

Our Ref 15-32268

Client Ref C4220B

Contract Title Monkton Fell, Hebburn

<b>Lab No</b>	796943	796944	796945	796946	796947	796948
<b>Sample ID</b>	TP51	TP53	TP53	TP57	TP59	TP59
<b>Depth</b>	0.10	0.10	0.50	0.10	0.10	1.00
<b>Other ID</b>						
<b>Sample Type</b>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
<b>Sampling Date</b>	02/04/15	02/04/15	02/04/15	02/04/15	02/04/15	02/04/15
<b>Sampling Time</b>	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>PAHs</b>									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.4	< 0.1	< 0.1	1.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.3	< 0.1	< 0.1	0.6	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	2.2	< 1.6
<b>Phenols</b>									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	0.5	< 0.3	< 0.3

# Summary of Chemical Analysis

## Soil Samples

Our Ref 15-32268

Client Ref C4220B

Contract Title Monkton Fell, Hebburn

Lab No	796949	796950	796951	796952	796953	796954
Sample ID	TP60	TP62	TP62	TP66	TP66	TP68
Depth	0.10	0.10	0.50	0.10	0.60	0.10
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	02/04/15	02/04/15	02/04/15	02/04/15	02/04/15	02/04/15
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	14	20				19
Cadmium	DETSC 2301#	0.1	mg/kg	0.6	0.8				0.6
Chromium	DETSC 2301#	0.15	mg/kg	42	44				45
Copper	DETSC 2301#	0.2	mg/kg	44	83				57
Lead	DETSC 2301#	0.3	mg/kg	110	140				130
Mercury	DETSC 2325#	0.05	mg/kg	0.12	0.23				0.23
Nickel	DETSC 2301#	1	mg/kg	22	29				24
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5				0.8
Zinc	DETSC 2301#	1	mg/kg	120	150				98
<b>Inorganics</b>									
pH	DETSC 2008#			6.9	7.3				6.1
Cyanide Total	DETSC 2130#	0.1	mg/kg			0.2	3.3	0.3	
Total Organic Carbon	DETSC 2002	0.1	%	4.6	14				4.8
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	41	110				110
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.09	0.10				0.12
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg			< 0.01	< 0.01	< 0.01	
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg			< 0.01	< 0.01	< 0.01	
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg			< 0.01	< 0.01	< 0.01	
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg			< 1.5	< 1.5	< 1.5	
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg			< 1.2	< 1.2	< 1.2	
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg			< 1.5	< 1.5	< 1.5	
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg			< 3.4	< 3.4	< 3.4	
Aliphatic C5-C35	DETSC 3072*	10	mg/kg			< 10	< 10	< 10	
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg			< 0.01	< 0.01	< 0.01	
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg			< 0.01	< 0.01	< 0.01	
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg			< 0.01	< 0.01	< 0.01	
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg			< 0.9	< 0.9	< 0.9	
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg			< 0.5	< 0.5	< 0.5	
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg			< 0.6	< 0.6	< 0.6	
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg			< 1.4	< 1.4	< 1.4	
Aromatic C5-C35	DETSC 3072*	10	mg/kg			< 10	< 10	< 10	
TPH Ali/Aro	DETSC 3072*	10	mg/kg			< 10	< 10	< 10	
Benzene	DETSC 3321#	0.01	mg/kg			< 0.01	< 0.01	< 0.01	
Ethylbenzene	DETSC 3321#	0.01	mg/kg			< 0.01	< 0.01	< 0.01	
Toluene	DETSC 3321#	0.01	mg/kg			< 0.01	< 0.01	< 0.01	
Xylene	DETSC 3321#	0.01	mg/kg			< 0.01	< 0.01	< 0.01	
MTBE	DETSC 3321	0.01	mg/kg			< 0.01	< 0.01	< 0.01	

# Summary of Chemical Analysis

## Soil Samples

Our Ref 15-32268

Client Ref C4220B

Contract Title Monkton Fell, Hebburn

<b>Lab No</b>	796949	796950	796951	796952	796953	796954
<b>Sample ID</b>	TP60	TP62	TP62	TP66	TP66	TP68
<b>Depth</b>	0.10	0.10	0.50	0.10	0.60	0.10
<b>Other ID</b>						
<b>Sample Type</b>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
<b>Sampling Date</b>	02/04/15	02/04/15	02/04/15	02/04/15	02/04/15	02/04/15
<b>Sampling Time</b>	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>PAHs</b>									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	2.3
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.5
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.4
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3
Phenanthrene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.6	< 0.1	< 0.1	0.3	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	0.2	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	3.6
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.5
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	6.0
PAH	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	15
<b>Phenols</b>									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	0.3

## Information in Support of the Analytical Results

Our Ref 15-32268  
Client Ref C4220B  
Contract Monkton Fell, Hebburn

### Containers Received & Deviating Samples

Lab No	Sample ID	Date		Holding time exceeded for tests	Inappropriate container for tests
		Sampled	Containers Received		
796943	TP51 0.10 SOIL	02/04/15	GJ 250ml	pH (7 days)	
796944	TP53 0.10 SOIL	02/04/15	GJ 250ml		
796945	TP53 0.50 SOIL	02/04/15	GJ 250ml		
796946	TP57 0.10 SOIL	02/04/15	GJ 250ml	pH (7 days)	
796947	TP59 0.10 SOIL	02/04/15	GJ 250ml	pH (7 days)	
796948	TP59 1.00 SOIL	02/04/15	GJ 250ml		
796949	TP60 0.10 SOIL	02/04/15	GJ 250ml	pH (7 days)	
796950	TP62 0.10 SOIL	02/04/15	GJ 250ml	pH (7 days)	
796951	TP62 0.50 SOIL	02/04/15	GJ 250ml		
796952	TP66 0.10 SOIL	02/04/15	GJ 250ml		
796953	TP66 0.60 SOIL	02/04/15	GJ 250ml		
796954	TP68 0.10 SOIL	02/04/15	GJ 250ml	pH (7 days)	

Key: G-Glass J-Jar

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time and/or inappropriate containers are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

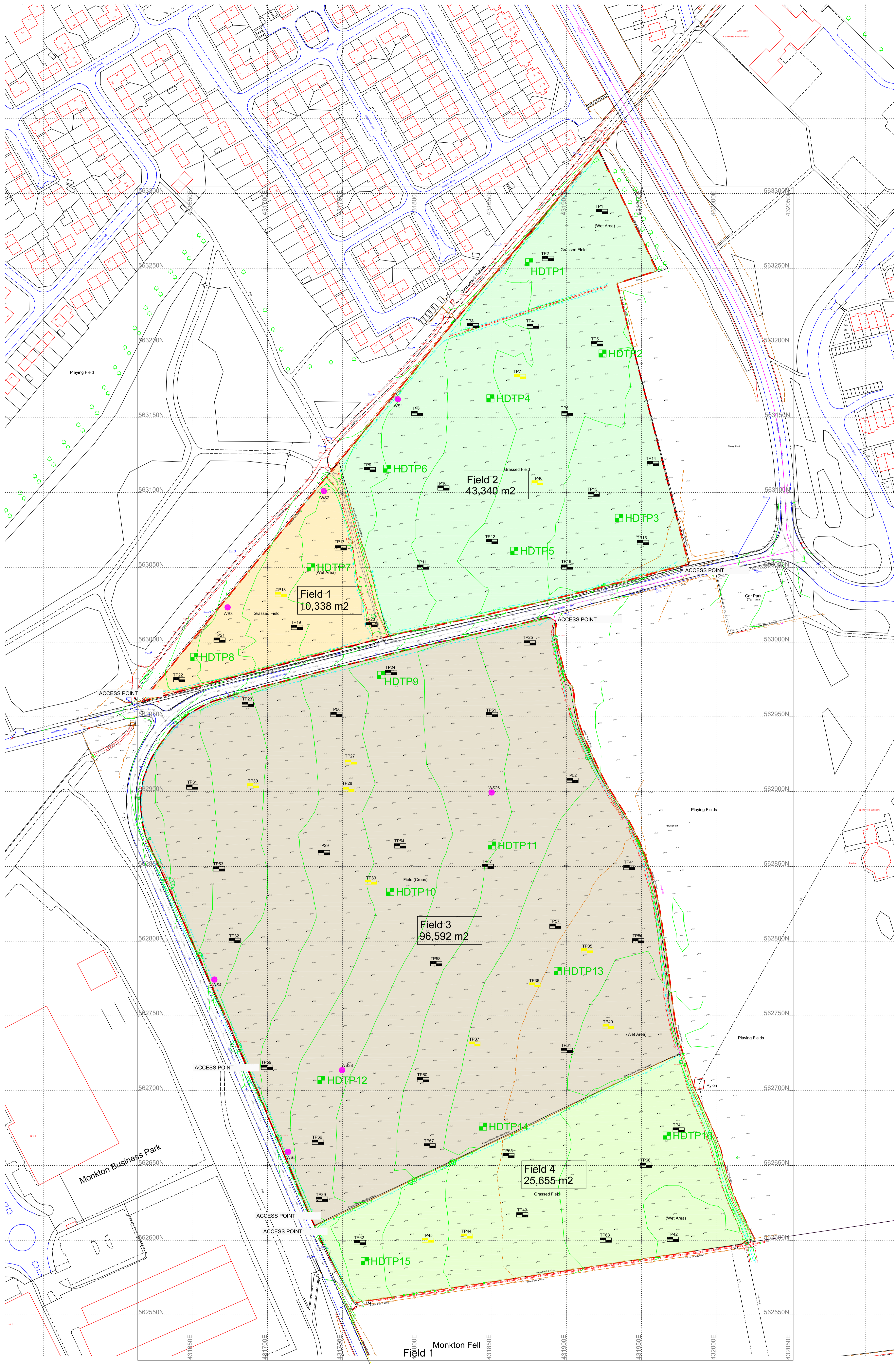
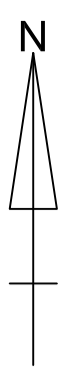
## Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETS 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETS 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETS 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETS 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETS 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETS 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETS 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETS 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETS 2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETS 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETS 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETS 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETS 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETS 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETS 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETS 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

## Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.



**NOTES**

- Sirius Trial pit location
- Sirius Trial pit location (Archaeological)
- Window Sample location

- TP
1. 431923, 563287
  2. 431887, 563256
  3. 431837, 563211
  4. 431877, 563211
  5. 431920, 563199
  6. 431900, 563153
  7. 431886, 563177
  8. 431800, 563153
  9. 431786, 563115
  10. 431817, 563103
  11. 431804, 563050
  12. 431849, 563067
  13. 431918, 563098
  14. 431957, 563119
  15. 431951, 563066
  16. 431900, 563050
  17. 431748, 563063
  18. 431708, 563031
  19. 431719, 563009
  20. 431769, 563011
  21. 431667, 563001
  22. 431646, 562974
  23. 431688, 562958
  24. 431762, 562979
  25. 431875, 562969
  26. 431850, 562900 (WS)
  27. 431755, 562910
  28. 431754, 562901
  29. 431737, 562859
  30. 431695, 562804
  31. 431649, 562903
  32. 431677, 562800
  33. 431769, 562839
  34. 431941, 562850 (WS)
  35. 431913, 562793
  36. 431878, 562770
  37. 431838, 562731
  38. 431750, 562714 (WS)
  39. 431736, 562627
  40. 431927, 562743
  41. 431974, 562673
  42. 431971, 562690
  43. 431870, 562616
  44. 431833, 562602
  45. 431807, 562600
  46. 431880, 563106

- WS
1. 431787, 563162
  2. 431737, 563100
  3. 431673, 563023
  4. 431664, 562774
  5. 431713, 562659

- HDTP
1. 431875, 563254
  2. 431924, 563193
  3. 431935, 563083
  4. 431849, 563163
  5. 431965, 563061
  6. 431780, 563116
  7. 431729, 568050
  8. 431651, 562990
  9. 431772, 562968
  10. 431782, 562833
  11. 431850, 562864
  12. 431736, 562707
  13. 431894, 562780
  14. 431844, 562676
  15. 431765, 562686
  16. 431967, 562670

**REVISION**

0	>>
A	Holes moved to accommodate archaeological requirements
B	>>
C	>>
D	>>

**SIRIUS GEOTECHNICAL & ENVIRONMENTAL**  
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 Langley Moor  
 Durham DH7 8HJ  
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 TEL: 0191 378 9972  
 FAX: 0191 378 1537



**CLIENT**

**Taylor Wimpey Northeast Ltd  
 and  
 Barrett Homes Northeast Ltd**

**SITE**

**Monkton Fell,  
 South Tyneside**

**DRAWING TITLE**

**Exploratory Hole  
 Location Plan**

<b>DRAWING NO.</b> C4220B/02	<b>REVISION NO.</b> A
<b>DRAWN BY</b> DCB	<b>APPROVED BY</b> >>
<b>DATE</b> 22.04.15	<b>SCALE</b> 1:1000
	<b>PAPER SIZE</b> A0



# TRIAL PIT RECORD

TP No. **TP50**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
01/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES D	0.10m	118.0
D	0.50m	
D	1.50m	
D	2.50m	
D	3.50m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone.

Stiff brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone. Occasional sub-rounded and rounded cobbles of sandstone.

From 1.2m to 3.5m: Becomes fissured and friable.

End of Trial Pit at 3.50 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.20		
3.50		

### Remarks and Water Observations

- Pit remained stable.
- Groundwater not observed.
- East west trending ceramic field drain encountered at 0.9m.

GL (m AOD)

-  
Easting:  
-  
Northing:  
-

Fig. No.

TP50





# TRIAL PIT RECORD

TP No. **TP51**

Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
01/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES D	0.10m	
D	0.50m	60.0 65.0 63.0
D	1.10m	
D	2.10m	
D	3.10m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff medium strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone. Occasional sub-rounded and rounded cobbles of sandstone.

From 1.3m to 3.3m: Becomes fissured and friable.

End of Trial Pit at 3.30 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.20		
3.30		

**Remarks and Water Observations**

- Pit remained stable.
- Groundwater not observed.
- North south trending ceramic field drain encountered at 1.0m.

**GL (m AOD)**

-

**Easting:**

-

**Northing:**

-

**Fig. No.**

TP51



# TRIAL PIT RECORD

TP No. **TP52**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
01/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES	0.10m	
D	0.50m	
D	1.00m	
D	2.00m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.

From 1.5m to 3.0m: Becomes fissured and friable.

End of Trial Pit at 3.00 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.30		
3.00		

### Remarks and Water Observations

1. Pit remained stable.
2. Groundwater not observed.

GL (m AOD)

-

Easting:

-

Northing:

-

Fig. No.

TP52



# TRIAL PIT RECORD

TP No. **TP53**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
02/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES	0.10m	105.0
ES D	0.50m	
D	0.80m	
D	1.80m	
D	2.80m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff high strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.

From 1.5m to 3.0m: Becomes fissured and friable.

End of Trial Pit at 3.00 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.30		
3.00		

### Remarks and Water Observations

1. Pit remained stable.
2. Groundwater not observed.

GL (m AOD)

- Easting:

- Northing:

-

Fig. No.

TP53



# TRIAL PIT RECORD

TP No. **TP54**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
01/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES	0.10m	
D	0.40m	
D	0.50m	
		108.0 118.0
D	1.80m	
D	2.80m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff high strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.

From 1.0m to 3.2m: Becomes fissured and friable.

End of Trial Pit at 3.20 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.30		
3.20		

**Remarks and Water Observations**

1. Pit remained stable.
2. Groundwater not observed.

**GL (m AOD)**

-

**Easting:**

-

**Northing:**

-

**Fig. No.**

**TP54**



# TRIAL PIT RECORD

TP No. **TP55**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
01/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>	Groundwater
ES D	0.10m		
D	0.50m	70.0 65.0	
D	1.00m		
D	2.00m		
D	3.00m		

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff medium strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.

From 0.9m to 3.4m: Becomes fissured and friable.

From 2.5m to 3.4m: Occasional sub-rounded limestone boulders.

End of Trial Pit at 3.40 m

Logged By: DG

Checked By: 4DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.20		
3.40		

### Remarks and Water Observations

1. Pit remained stable.
2. Groundwater not observed.

GL (m AOD)

-

Eastings:

-

Northing:

-

Fig. No.

TP55



# TRIAL PIT RECORD

TP No. **TP56**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
01/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES	0.10m	
D	0.50m	
D	0.90m	
D	2.00m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.

From 1.0m to 3.0m: Becomes fissured and friable.

End of Trial Pit at 3.00 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.20		
3.00		

### Remarks and Water Observations

1. Pit remained stable.
2. Groundwater not observed.

GL (m AOD)

-

Easting:

-

Northing:

-

Fig. No.

TP56



# TRIAL PIT RECORD

TP No. **TP57**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
01/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES	0.10m	
D	0.50m	70.0 60.0
D	0.90m	
D	1.90m	
D	2.90m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff medium strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.

From 1.0m to 3.0m: Becomes fissured and friable.

End of Trial Pit at 3.00 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.20		
3.00		

### Remarks and Water Observations

1. Pit remained stable.
2. Groundwater not observed.

GL (m AOD)

-

Easting:

-

Northing:

-

Fig. No.

TP57



# TRIAL PIT RECORD

TP No. **TP58**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
01/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES	0.10m	
D	0.40m	
D	0.90m	
D	1.90m	
D	2.90m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.

From 0.6m to 3.0m: Becomes fissured and friable.

End of Trial Pit at 3.00 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.20		
3.00		

### Remarks and Water Observations

- Pit remained stable.
- Groundwater not observed.

GL (m AOD)

-

Easting:

-

Northing:

-

Fig. No.

TP58





# TRIAL PIT RECORD

TP No. **TP59**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
02/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Groundwater

## STRATA RECORD

Logged By: DG

Checked By: DB

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>	Description	Depth (m)	Level (mAOD) PID (ppm)	Legend
ES	0.10m		Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.	0.20		
ES D	0.50m		Stiff brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.			
ES D	1.00m					
D	2.00m		From 1.3m to 3.0m: Becomes fissured and friable.			
D	3.00m		End of Trial Pit at 3.00 m	3.00		

**Remarks and Water Observations**

1. Pit remained stable.
2. Groundwater not observed.

**GL (m AOD)**

-

**Easting:**

-

**Northing:**

-

**Fig. No.**

**TP59**



# TRIAL PIT RECORD

TP No. **TP60**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
01/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Groundwater

## STRATA RECORD

Logged By: DG

Checked By: DB

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>	Description	Depth (m)	Level (mAOD) PID (ppm)	Legend
ES	0.10m		Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.	0.20		
D	0.40m		Stiff high strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.			
D	0.90m	115.0				
D	2.00m		From 1.5m to 3.0m: Becomes fissured and friable.			
D	3.00m		End of Trial Pit at 3.00 m	3.00		

**Remarks and Water Observations**

1. Pit remained stable.
2. Groundwater not observed.

**GL (m AOD)**

-

**Easting:**

-

**Northing:**

-

**Fig. No.**

**TP60**



# TRIAL PIT RECORD

TP No. **TP61**

Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
01/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES	0.10m	
D	0.30m	
D	0.70m	94.0 85.0
D	1.70m	
D	2.70m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff high strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.

From 1.5m to 3.0m: Becomes fissured and friable.

End of Trial Pit at 3.00 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.30		
3.00		

### Remarks and Water Observations

1. Pit remained stable.
2. Groundwater not observed.
3. East west trending ceramic field drain encountered at 1.1m.

GL (m AOD)

-

Easting:

-

Northing:

-

Fig. No.

TP61



# TRIAL PIT RECORD

TP No. **TP62**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
02/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES	0.10m	
ES	0.50m	
D	0.60m	85.0 70.0 73.0
D	1.00m	110.0
D	2.00m	
D	3.00m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff high strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.

From 0.9m to 3.0m: Becomes fissured and friable.

End of Trial Pit at 3.00 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.20		
3.00		

### Remarks and Water Observations

1. Pit remained stable.
2. Groundwater not observed.

GL (m AOD)

-

Easting:

-

Northing:

-

Fig. No.

TP62



# TRIAL PIT RECORD

TP No. **TP63**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
02/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES	0.10m	
D	0.50m	65.0 58.0 61.0
D	1.00m	110.0
D	2.00m	
D	3.00m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff medium strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.

From 1.0m to 3.0m: Becomes high strength fissured and friable.

End of Trial Pit at 3.00 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.30		
3.00		

### Remarks and Water Observations

1. Pit remained stable.
2. Groundwater not observed.

GL (m AOD)

-

Easting:

-

Northing:

-

Fig. No.

TP63



# TRIAL PIT RECORD

TP No. **TP65**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
02/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>	Groundwater
ES	0.10m		
D	0.40m	75.0 65.0 53.0	
D	1.00m	95.0 112.0 110.0	
D	1.80m		
D	2.30m		
D	2.60m		

## STRATA RECORD

Description	
<p>Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.</p> <p>Stiff medium strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.</p> <p>Below 0.9m bgl: Becomes high strength.</p> <p>From 1.5m to 3.0m: Becomes fissured and friable.</p> <p>End of Trial Pit at 3.10 m</p>	<p>0.30</p> <p>3.10</p>

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.10		
0.40		
1.00		
1.80		
2.30		
2.60		
3.10		

### Remarks and Water Observations

1. Pit remained stable.
2. Groundwater not observed.

GL (m AOD)

Easting:

Northing:

Fig. No.

TP65



# TRIAL PIT RECORD

TP No. **TP66**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
02/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES	0.10m	
ES D	0.60m	90.0 85.0
D	1.00m	
D	2.00m	
D	3.00m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff high strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.

From 1.0m to 3.0m: Becomes fissured and friable.

End of Trial Pit at 3.00 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.20		
3.00		

**Remarks and Water Observations**

1. Pit remained stable.
2. Groundwater not observed.

**GL (m AOD)**

-

**Easting:**

-

**Northing:**

-

**Fig. No.**

**TP66**



# TRIAL PIT RECORD

TP No. **TP67**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
01/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>	Groundwater
ES	0.10m		
D	0.50m	70.0 74.0 60.0	
D	1.00m		
D	2.00m		
D	3.00m		

## STRATA RECORD

Description		Depth (m)	Level (mAOD) PID (ppm)	Legend
Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.		0.30		
Stiff medium strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.				
From 1.5m to 3.0m: Becomes fissured and friable.				
End of Trial Pit at 3.20 m		3.20		

Logged By: DG

Checked By: DB

### Remarks and Water Observations

1. Pit remained stable.
2. Groundwater not observed.

GL (m AOD)

-

Easting:

-

Northing:

-

Fig. No.

TP67





# TRIAL PIT RECORD

TP No. **TP68**  
Sheet 1 of 1

Site : Monkton Fell, South Tyneside

Contract No:  
**C4220B**

Client : **Taylor Wimpey (NE) Ltd and Barratt Homes Ltd**

Dates:  
02/04/2015

Method : Excavated using a JCB 3CX and a 600mm toothed bucket.

**Scale 1:25**

## SAMPLE DETAILS

Type	Depth From - To(m)	Vane Results kN/m <sup>2</sup>
ES	0.10m	
D	0.50m	60.0 75.0 60.0
D	1.00m	118.0
D	2.00m	

Groundwater

## STRATA RECORD

Description

Soft to firm dark brown sandy gravelly CLAY (topsoil). Gravel is sub-angular to rounded fine to coarse sandstone and mudstone and occasional pottery.

Stiff medium strength brown mottled grey sandy gravelly CLAY. Gravel is sub-angular to rounded fine to coarse sandstone mudstone and limestone and occasional coal. Occasional sub-rounded and rounded cobbles of sandstone.

From 1.0m to 3.1m: Becomes high strength fissured and friable.

End of Trial Pit at 3.10 m

Logged By: DG

Checked By: DB

Depth (m)	Level (mAOD) PID (ppm)	Legend
0.30		
3.00		

### Remarks and Water Observations

1. Pit remained stable.
2. Groundwater not observed.

GL (m AOD)

-

Easting:

-

Northing:

-

Fig. No.

TP68