

005/2827/GLM

6th September 2017

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Dear Guy

Manor Farm, Otley Road, Adel - preliminary findings

Further to completion of the recent fieldwork at the above site please find enclosed a summary of our preliminary findings.

To date, no significant ground-related abnormalities have been identified.

Made ground has been encountered to a maximum depth of 0.9m (WS09) but typically only reaches depths of about 0.5m.

No visual or olfactory evidence of overly gross contamination was noted during the investigation.

The natural ground (residual soils) are anticipated to be suitable for 'traditional' strip footings for 2 storey residential dwellings. Bedrock was encountered in the majority of exploratory holes from between 0.7m and 1.9m.

Laboratory analysis is now underway and we expect to issue our final Geoenvironmental Appraisal Report by early October 2017.

Should you require any further information, please contact the undersigned.

Yours sincerely

A handwritten signature in black ink, appearing to read 'George Morton', is written over a light grey, semi-transparent signature line.

George Morton
Senior Engineer
for and on behalf of
LITHOS CONSULTING LIMITED

enc

Preliminary Summary of Geoenvironmental Issues
Exploratory Hole Records
Drawing 2827/6 – Exploratory Hole Location Plan



These findings may be revised in the light of laboratory testing, and during the more rigorous review of field data that will be undertaken prior to issue of our comprehensive report.

Proposed development

We understand that your proposed development will include traditional two storey domestic dwellings, with associated gardens and adoptable roads and sewers, but to date no layout has been made available.

Preliminary investigation

Issue	Remarks
The site	7.5km north of Leeds city centre 1.1 ha (2.7 acres) Mature trees & hedgerows make up much of the sites boundaries. Additional hedgerows cross the site. About 50% of the sites area is occupied by hardstand (macadam planings or concrete) and buildings.
Former uses	Former farm buildings, farmyard and farmland. Redeveloped as a business park in c.1980.
Environmental setting	Sandstone units within Coal Measures at shallow depth beneath a veneer of Residual Soil. Site lies beyond the Coal Authority's defined coalfields. Bedrock is a Secondary A Aquifer. Flood Zone 1.

Ground investigation.

Fieldwork was supervised by Lithos between the 4th and 5th August 2017 and comprised the exploratory holes listed below.

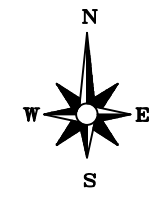
Technique	Exploratory holes	Final depth(s)	Remarks
Window sample boreholes	WSs 1 to 19	0.4m to 2.5m	Monitoring wells installed within WSs 1, 2, 5, 15 & 18. SPT tests carried out within natural soils.

Issue	Remarks
Access restrictions	Restricted access was available across the majority of the site due to existing buildings and ongoing site usage. Window sampling was the only practical means of investigation.
Made ground	Veneer of made ground across the majority of the site to a maximum depth of 0.9m, but typically 0.5m, predominantly comprising Concrete Hardstand or Tarmac Planings overlaying Sub-Base and/or Relict Topsoil. Burnt Shale encountered within three WSs (11, 14 & 15 to a maximum depth of 0.65m)
Natural ground	Granular Residual Soil (medium dense to dense gravelly sand) & Cohesive Residual Soil (firm to stiff sandy gravelly clay) underlies the made ground across the entire site. Sandstone bedrock was encountered in the majority of window sample boreholes at depths of between 0.7m and 1.9m.
Contamination	A very faint olfactory evidence of hydrocarbon contamination was noted within Made Ground in WS11. Samples of made ground and natural topsoil have been forwarded to a laboratory for testing to determine its suitability for re-use/retention on site.
Preparatory works	Demolition of existing buildings, grubbing up of hardstand, site clearance including trees, vegetation etc & any remaining materials left by current site users. Some localized site regrade will be required. A post-demolition site investigation (trial pitting) is recommended.
Foundations	Traditional 2-storey residential dwellings are anticipated to be founded on traditional strip footings at minimum depths of around 0.6m to 1m. Overdeepening will be required in areas of deeper made ground (including through any relict foundations post-demolition) and within the zone of influence of trees.
Groundwater & excavations	Groundwater was not encountered within any of the exploratory holes. Shallow excavations are likely remain stable during the construction phase in the short term.
Drainage	Soakaways might be a suitable means of surface water disposal at the site although this should be verified by in-situ testing in accordance with BRE Digest 365.
Development constraints	An underground gas utility and a private water utility cross the site. The sloping nature of the site will likely necessitate regrading and use of retaining walls.

MANOR FARM, OTLEY ROAD, ADEL - SUMMARY OF FINDINGS TO DATE



Hold ID	Final Depth	Depth to Base (mbgl)										Bedrock		Remarks
		Total Made Ground	Concrete Hardstand	Macadam Planings	Burnt Shale	Sub-Base	Relict Topsoil	Made Ground Topsoil	Topsoil	Cohesive Residual Soil	Granular Residual Soil	Top	Bottom	
WS01	1.5	0.3	-	-	-	-	-	0.3	-	-	0.8	0.8	>1.5	Monitoring well installed
WS02	2.1	0	-	-	-	-	-	-	0.3	1	2.1	-	-	Monitoring well installed
WS03	1.5	0.45	0.14	-	-	0.3	0.45	-	-	1.3	-	1.3	>1.5	-
WS04	2	0.2	0.12	-	-	0.2	-	-	-	0.35	0.7	0.7	-	-
WS05	2.2	0.25	0.16	-	-	0.25	-	-	-	1.1	1.8	1.8	>2.2	Monitoring well installed
WS06	2.3	0.4	0.21	-	-	0.4	-	-	-	-	1.7	1.7	>2.3	-
WS07	1.5	0.25	0.15	-	-	-	0.25	-	-	-	0.9	0.9	>1.5	-
WS08	1.5	0.13	-	0.13	-	-	-	-	-	-	1	1	>1.5	-
WS09	2.5	0.9	0.11	0.5	-	-	0.9	-	-	1.9	1.5	1.9	>2.3	-
WS10	1.6	0.45	0.21 & 0.45	-	-	0.25	-	-	-	0.8	1.3	1.3	>1.6	-
WS11	1.8	0.5	0.12	-	0.25	0.5	-	-	-	-	1.3	1.3	>1.8	-
WS12	1.5	0.5	0.25	-	-	-	0.5	-	-	-	0.9	0.9	>1.5	2mm thick steel plate with green painted sides within concrete.
WS13	2	0.6	0.17	-	-	-	0.6	-	-	-	1.7	1.7	>2.0	-
WS14	2	0.65	0.23	0.3	0.65	0.45	-	-	-	1.3	-	1.3	>2.0	-
WS15	1.5	0.5	0.14	0.25	0.5	-	0.4	-	-	0.9	-	0.9	>1.5	Monitoring well installed
WS16	0.4	>0.4	>0.4	-	-	0.4	-	-	-	-	-	-	-	0.4m Refusal on a second concrete slab.
WS17	1.5	0.4	0.4	-	-	-	-	0.4	-	-	0.8	0.8	>1.5	-
WS18	2.2	0	-	-	-	-	-	-	0.6	1.8	-	1.8	>2.2	Monitoring well installed
WS19	1.5	0.4	-	0.25	-	-	0.4	-	-	-	>1.5	-	-	-



- NOTES
- GRASS & OVERGROWN AREAS
 - CONCRETE HARDSTANDING
 - BUILDING
 - GRAVEL OR HARDCORE SURFACING
 - + DYNAMIC SAMPLE BOREHOLE LOCATION
 - APPROXIMATE SITE BOUNDARY

REV.	DESCRIPTION	DATE



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CLIENT
NEWITT HOMES

JOB TITLE
**MANOR FARM,
OTLEY ROAD,
ADEL**

DRAWING TITLE
EXPLORATORY HOLE LOCATIONS

DRAWN GLM	DATE 07/09/2017	STATUS FOR COMMENT <input type="checkbox"/>
CHECKED REG	DATE 07/09/2017	FOR APPROVAL <input type="checkbox"/>
		DRAFT <input type="checkbox"/>
		FINAL <input checked="" type="checkbox"/>

SCALE 1:1000	SHEET A3	DRAWING NO. 2827/6	REVISION
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Borehole Log

Borehole No.

WS01

Sheet 1 of 1

Project Name: Manor Farm, Otey Road

Project No.
2827

Co-ords: -

Hole Type
WS

Location: Adel, Leeds

Level:

Scale
1:20

Client: Titchmarsh & Bagley

Dates: 04/09/2017 - 04/09/2017

Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	J,K&T		0.30		MADE GROUND: Dark greyish brown slightly sandy CLAY/SILT. Rare angular fine to medium gravel of pottery, concrete and sandstone. Occasional rootlets. (MADE GROUND TOPSOIL)	
		0.50	D		0.80		?Dense buff gravelly SAND. Gravel is angular to subangular fine to medium of sandstone. (GRANULAR RESIDUAL SOIL)	
		1.00 1.00	D	N=83 (12,16/21,22,20,20)	1.50		Medium strong fine grained SANDSTONE. Recovered as sandy subangular medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE)	
								1.5m Unable to drill further into bedrock. End of borehole at 1.50 m

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No.

WS02

Sheet 1 of 1

Project Name: Manor Farm, Otey Road

Project No.
2827

Co-ords: -

Hole Type
WS

Location: Adel, Leeds

Level:

Scale
1:20

Client: Titchmarsh & Bagley

Dates: 04/09/2017 - 04/09/2017

Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	J,K&T		0.30		TOPSOIL: Dark brown silty clay. Rare subangular fine gravel of sandstone and siltstone. Occasional rootlets. (TOPSOIL)		
		0.70	D				Stiff brown slightly sandy gravelly CLAY. Gravel is subangular fine to medium of sandstone. (COHESIVE RESIDUAL SOIL)		
		1.00		N=24 (6,6/6,6,6,6)	1.00		Medium dense light brown clayey fine SAND. (GRANULAR RESIDUAL SOIL)	1	
		1.40			1.40		Medium dense orangish brown fine SAND. Relict fractures with brown staining on surfaces. (GRANULAR RESIDUAL SOIL)		
		1.60	D		2.10				2
							End of borehole at 2.10 m		3
									4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No.

WS03

Sheet 1 of 1

Project Name: Manor Farm, Otey Road

Project No.
2827

Co-ords: -

Hole Type
WS

Location: Adel, Leeds

Level:

Scale
1:20

Client: Titchmarsh & Bagley

Dates: 04/09/2017 - 04/09/2017

Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.14			0.14		Strong grey CONCRETE. 70% aggregate of subangular to subrounded fine to medium gravel of mixed lithologies. 30% sandy cement matrix. Rare subrounded isolated voids. 8mm steel reinforcement at 0.1m. (HARDSTANDING)	
		0.25	J		0.30		MADE GROUND: Grey slightly silty angular fine GRAVEL of limestone. (SUB-BASE) MADE GROUND: Black sandy SILT. Rare subangular fine to medium gravel of pottery and siltstone. (RELICT TOPSOIL) Stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone. (COHESIVE RESIDUAL SOIL)	
		0.40	J&K		0.45			
		1.00		N=43 (6,8/11,10,11,11)	1.30		Moderately weak fine grained SANDSTONE. Recovered as slightly sandy angular fine to medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE) 1.5m Unable to drill further into bedrock. End of borehole at 1.50 m	
					1.50			

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No.

WS04

Sheet 1 of 1

Project Name: Manor Farm, Otey Road

Project No.
2827

Co-ords: -

Hole Type
WS

Location: Adel, Leeds

Level:

Scale
1:20

Client: Titchmarsh & Bagley

Dates: 04/09/2017 - 04/09/2017

Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10		Strong grey CONCRETE. 60% aggregate of subrounded fine to medium gravel of mixed lithologies. 40% sandy cement matrix. (HARDSTANDING)	
		0.30	J&K		0.20		MADE GROUND: Dark greyish brown silty subangular fine to medium GRAVEL of basalt & granite. (SUB-BASE)	
					0.35		Firm brown sandy silty CLAY. (COHESIVE RESIDUAL SOIL)	
					0.70		?Medium dense light brown silty/clayey fine SAND. (GRANULAR RESIDUAL SOIL)	
		0.80	D				Stiff light brown mottled grey slightly sandy CLAY. (COHESIVE RESIDUAL SOIL)	
		1.00		N=37 (6,6/6,9,11,11)				
					2.00		End of borehole at 2.00 m	

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Project Name: Manor Farm, Otey Road

Project No.
2827

Co-ords: -

Hole Type
WS

Location: Adel, Leeds

Level:

Scale
1:20

Client: Titchmarsh & Bagley

Dates: 04/09/2017 - 04/09/2017

Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	J		0.12 0.25		Strong grey CONCRETE. 70% aggregate of subangular to subrounded fine to medium gravel of mixed lithologies. 30% sandy cement matrix. Occasional spherical to irregular small isolated voids. (HARDSTANDING)	
		0.90	D		1.10		MADE GROUND: Dark brown and dark grey gravelly SAND. Gravel is subangular fine of sandstone. (SUB-BASE) Firm very sandy slightly gravelly CLAY. Gravel is subangular fine of sandstone. (COHESIVE RESIDUAL SOIL)	
		1.00		N=16 (1,2,3,5,6)				
		1.50	D					Medium dense light orangish brown slightly gravelly SAND. Gravel is subangular fine of sandstone. (GRANULAR RESIDUAL SOIL) <i>1.2m - 1.4m sand is silty.</i>
		2.00		N=131 (8,8/12,19,50,50)				Moderately weak light brown fine grained SANDSTONE. Recovered as angular fine gravel of sandstone. (MILLSTONE GRIT SANDSTONE)
					2.20		<i>2.2m Unable to drill further into bedrock.</i> End of borehole at 2.20 m	

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Project Name: Manor Farm, Otey Road

 Project No.
2827

Co-ords: -

 Hole Type
WS

Location: Adel, Leeds

Level:

 Scale
1:20

Client: Titchmarsh & Bagley

Dates: 04/09/2017 - 04/09/2017

 Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.21		Strong blueish grey CONCRETE. 60% aggregate of subangular fine gravel of limestone. 35% cement matrix. 5% spherical to sub spherical small isolated vesicles. (HARDSTANDING)	
		0.30	J,K&T		0.40		MADE GROUND: Greyish brown sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of concrete, quartzite and sandstone. Very faint detergent 'soapy' smell throughout. (SUB-BASE)	
		0.70	D				?Dense brown clayey fine SAND. (GRANULAR RESIDUAL SOIL) <i>From 0.7m with some subangular fine to medium gravel of sandstone.</i>	
					1.70		<i>1.6m - 1.7m Light grey colour.</i>	
		1.80	D				Moderately weak fine grained SANDSTONE. Recovered as slightly sandy angular tabular fine to medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE)	
		2.00					N=178 (18,24/28,50,50,50)	
					2.30		<i>2.3m Unable to drill further into bedrock.</i> End of borehole at 2.30 m	

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Project Name: Manor Farm, Otey Road

 Project No.
2827

Co-ords: -

 Hole Type
WS

Location: Adel, Leeds

Level:

 Scale
1:20

Client: Titchmarsh & Bagley

Dates: 04/09/2017 - 04/09/2017

 Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	J		0.15 0.25		Strong grey CONCRETE. 80% aggregate of subangular fine gravel of limestone 20% sandy matrix. Rare spherical small isolated vesicles. (HARDSTANDING)	
		0.80	D		0.90		MADE GROUND: Dark brown slightly sandy SILT. (RELICT TOPSOIL)	
		1.00		N=200 (9,47/50,50,50,50)	1.50		Moderately weak fine grained SANDSTONE. Recovered as slightly sandy angular fine to medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE)	
							1.5m Unable to drill further into bedrock. End of borehole at 1.50 m	

 1
2
3
4

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No.

WS08

Sheet 1 of 1

Project Name: Manor Farm, Otey Road

Project No.
2827

Co-ords: -

Hole Type
WS

Location: Adel, Leeds

Level:

Scale
1:20

Client: Titchmarsh & Bagley

Dates: 04/09/2017 - 04/09/2017

Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	J,K&T		0.13		MADE GROUND: Dark grey sandy subangular to subrounded fine to medium GRAVEL of macadam planings. (GRANULAR HARDSTANDING) ?Dense brown slightly silty/clayey fine SAND. (GRANULAR RESIDUAL SOIL)	
		0.50	D					
		1.00		N=195 (12,17/45,50,50,50)	1.00		Moderately weak fine grained SANDSTONE. Recovered as slightly sandy angular tabular fine to medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE)	
					1.50		1.5m Unable to drill further into bedrock. End of borehole at 1.50 m	

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Project Name: Manor Farm, Otey Road

 Project No.
2827

Co-ords: -

 Hole Type
WS

Location: Adel, Leeds

Level:

 Scale
1:20

Client: Titchmarsh & Bagley

Dates: 04/09/2017 - 04/09/2017

 Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.11		Strong grey CONCRETE. 80% aggregate of subangular fine gravel of limestone. 20% sandy cement matrix. Rare subspherical small to medium isolated voids. (HARDSTANDING)	
		0.30	J,K&T		0.50		MADE GROUND: Black slightly silty sandy subangular to subrounded fine to medium GRAVEL of predominantly macadam planings and occasional sandstone and limestone. Faint petroleum smell throughout. (MACADAM PLANINGS)	
		0.70	J,K&T		0.90		MADE GROUND: Brown sandy silty CLAY. Rare subangular fine gravel of sandstone, coal and pottery. Sandstone cobble and fragment of plastic at top. (RELICT TOPSOIL)	
		1.00		N=26 (4,4/5,6,6,9)	1.20		Medium dense orangish brown slightly clayey fine SAND. With relict fractures with brown staining on surfaces. (GRANULAR RESIDUAL SOIL)	
		1.20	D		1.50		Firm friable brown sandy CLAY. (COHESIVE RESIDUAL SOIL)	
		2.00		N=52 (8,8/12,12,13,15)	1.90		Moderately weak fine grained SANDSTONE. Recovered as slightly sandy angular tabular fine to medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE)	
					2.50		2.5m Unable to drill further into bedrock. End of borehole at 2.50 m	

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Project Name: Manor Farm, Otey Road

 Project No.
2827

Co-ords: -

 Hole Type
WS

Location: Adel, Leeds

Level:

 Scale
1:20

Client: Titchmarsh & Bagley

Dates: 04/09/2017 - 04/09/2017

 Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.21		Strong grey CONCRETE. 80% aggregate of subangular to subrounded fine to medium gravel of mixed lithologies. 20% sandy cement matrix. Rare spherical small isolated vesicles. 8mm Steel reinforcement at 0.09m. (HARDSTANDING)	
					0.25			
					0.45		MADE GROUND: grey silty subangular GRAVEL of mixed lithologies. (SUB-BASE)	
		0.60	D		0.80		Strong blueish grey CONCRETE: 70% aggregate of subangular fine gravel of limestone. 30% sandy cement matrix. Rare irregular small isolated voids. (HARDSTANDING)	
		1.00		N=45 (7,8/10,10,12,13)	1.10	D	Firm brown sandy slightly gravelly CLAY. (COHESIVE RESIDUAL SOIL)	
		1.10	D		1.30		Dense orangish brown slightly clayey gravelly SAND. Gravel is subangular medium of sandstone. (GRANULAR RESIDUAL SOIL)	
					1.60		Moderately weak fine grained SANDSTONE. Recovered as slightly sandy angular tabular fine to medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE)	
							1.6m Unable to drill further into bedrock. End of borehole at 1.60 m	

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No.

WS11

Sheet 1 of 1

Project Name: Manor Farm, Otey Road

Project No.
2827

Co-ords: -

Hole Type
WS

Location: Adel, Leeds

Level:

Scale
1:20

Client: Titchmarsh & Bagley

Dates: 05/09/2017 - 05/09/2017

Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	J		0.12		<p>Strong pinkish grey CONCRETE. 70% aggregate of subangular fine to medium gravel of limestone. 30% sandy cement matrix. Rare sub spherical to irregular small isolated voids. 5mm steel reinforcement at 0.05m (HARDSTANDING)</p> <p>MADE GROUND: Red and brown slightly silty sandy angular fine GRAVEL of burnt shale and rare sandstone and clinker. (BURNT SHALE)</p> <p>MADE GROUND: Brown sandy clayey SILT. Rare subangular fine gravel of sandstone and coal. (RELICT TOPSOIL)</p> <p>Dense light yellowish brown clayey gravelly SAND. Gravel is subangular fine to medium of sandstone. (GRANULAR RESIDUAL SOIL)</p> <p>Moderately weak fine grained SANDSTONE. Recovered as slightly sandy angular tabular fine to medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE)</p> <p>1.8m Unable to drill further into bedrock. End of borehole at 1.80 m</p>	
		0.40	J,K&T		0.25			
		1.00		N=36 (9,9/9,10,8,9)	0.50			
					1.30			
					1.80			

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Project Name: Manor Farm, Otey Road

 Project No.
2827

Co-ords: -

 Hole Type
WS

Location: Adel, Leeds

Level:

 Scale
1:20

Client: Titchmarsh & Bagley

Dates: 05/09/2017 - 05/09/2017

 Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.25		<p>Strong blueish grey CONCRETE. 70% aggregate of subangular fine to medium gravel of mixed lithologies. 25% sandy cement matrix. Rare spherical to subspherical small isolated voids. (HARDSTANDING) <i>0.16m 2mm thick steel plate with green painted sides within concrete.</i></p> <p>MADE GROUND: Dark brown slightly sandy CLAY. Rare subangular fine to medium gravel of brick, sandstone and coal. (RELICT TOPSOIL)</p> <p>?Dense orangish brown clayey gravelly SAND. Gravel is subangular fine to medium of sandstone. (GRANULAR RESIDUAL SOIL)</p> <p>Moderately weak light brown SANDSTONE. Recovered as slightly clayey slightly sandy angular to subangular tabular fine to medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE)</p> <p style="text-align: center;">End of borehole at 1.50 m</p>	
		0.40	J,K&T		0.50			
		0.70	D		0.90			
		1.00 1.00	D	N=39 (6,6/8,9,10,12)	1.50			

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2
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Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Project Name: Manor Farm, Otey Road

 Project No.
2827

Co-ords: -

 Hole Type
WS

Location: Adel, Leeds

Level:

 Scale
1:20

Client: Titchmarsh & Bagley

Dates: 05/09/2017 - 05/09/2017

 Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.17		Strong grey CONCRETE. 70% aggregate of subangular to subrounded fine to medium gravel of mixed lithologies. 30% sandy cement matrix. Rare subrounded isolated voids. (HARDSTANDING) MADE GROUND: Brown slightly sandy clayey SILT. (RELICT TOPSOIL)	
		0.40	J,K&T		0.60			
		0.90	D		1.70		?Dense light yellowish brown slightly clayey gravelly fine SAND. Gravel is subangular fine to medium of sandstone. (GRANULAR RESIDUAL SOIL)	
		1.90	D		2.00			
							Moderately weak light yellowish brown fine grained SANDSTONE. Recovered as slightly clayey slightly sandy angular tabular fine to medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE) End of borehole at 2.00 m	

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No.

WS14

Sheet 1 of 1

Project Name: Manor Farm, Otey Road

Project No.
2827

Co-ords: -

Hole Type
WS

Location: Adel, Leeds

Level:

Scale
1:20

Client: Titchmarsh & Bagley

Dates: 05/09/2017 - 05/09/2017

Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.25	J		0.23		<p>Strong grey CONCRETE. 60% aggregate of subangular to subrounded fine to medium gravel of limestone. 40% sandy cement matrix. Rare spherical small isolated vesicles. (HARDSTANDING)</p> <p>MADE GROUND: Black sandy, including ash sand, subangular fine GRAVEL of macadam planings. (MACADAM PLANINGS)</p> <p>MADE GROUND: Grey slightly sandy subangular fine to medium GRAVEL of limestone. (SUB-BASE)</p> <p>MADE GROUND: Reddish brown slightly clayey angular tabular fine GRAVEL of predominantly burnt shale and occasional coal. (BURNT SHALE)</p> <p>Firm light brown sandy slightly gravelly CLAY. Gravel is subangular fine of sandstone. (COHESIVE RESIDUAL SOIL)</p>	
		0.40	J		0.30			
		0.60	J		0.45			
		0.90	D		0.65			
		1.00		N=52 (2,4/9,13,14,16)	1.30		<p>Moderately weak fine grained SANDSTONE. Recovered as slightly sandy angular tabular fine to medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE)</p>	
					2.00			
<p>2.0m Unable to drill further into bedrock. End of borehole at 2.00 m</p>								

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No.

WS15

Sheet 1 of 1

Project Name: Manor Farm, Otey Road

Project No.
2827

Co-ords: -

Hole Type
WS

Location: Adel, Leeds

Level:

Scale
1:20

Client: Titchmarsh & Bagley

Dates: 05/09/2017 - 05/09/2017

Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
Well		0.20	J		0.14		Strong grey CONCRETE. 60% aggregate of subangular to subrounded fine to medium gravel of limestone. 40% sandy cement matrix. Rare spherical small isolated vesicles.	
		0.30	J		0.25		(HARDSTANDING)	
		0.45	D		0.40		MADE GROUND: Black sandy subangular fine to medium GRAVEL of macadam planings.	
					0.50		(MACADAM PLANINGS)	
		0.70	D				MADE GROUND: Brown mottled black sandy gravelly CLAY. Gravel is subangular fine of sandstone.	
					0.90		(RELICT TOPSOIL)	
		1.00		N=38 (5,9/9,9,10,10)			MADE GROUND: Reddish brown slightly sandy angular fine GRAVEL of burnt shale.	
							(BURNT SHALE)	
							Stiff brown sandy CLAY.	
							(COHESIVE RESIDUAL SOIL)	
							Moderately weak light yellowish brown fine grained SANDSTONE. Recovered as slightly clayey slightly sandy angular tabular fine to medium gravel of sandstone.	
							(MILLSTONE GRIT SANDSTONE)	
					1.50		1.5m Unable to drill further into bedrock. End of borehole at 1.50 m	

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No.

WS16

Sheet 1 of 1

Project Name: Manor Farm, Otey Road

Project No.
2827

Co-ords: -

Hole Type
WS

Location: Adel, Leeds

Level:

Scale
1:20

Client: Titchmarsh & Bagley

Dates: 05/09/2017 - 05/09/2017

Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	J		0.15		Strong blueish grey CONCRETE. 60% aggregate of subangular fine gravel of limestone. 40% sandy cement matrix. (HARDSTANDING)	
					0.40		MADE GROUND: Dark grey and buff sandy subangular GRAVEL of limestone, tarmac planings, sandstone and quartzite. (SUB-BASE) <i>0.4m Refusal on a second CONCRETE slab. Unable to drill further.</i> End of borehole at 0.40 m	

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Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Project Name: Manor Farm, Otey Road

 Project No.
2827

Co-ords: -

 Hole Type
WS

Location: Adel, Leeds

Level:

 Scale
1:20

Client: Titchmarsh & Bagley

Dates: 05/09/2017 - 05/09/2017

 Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	J,K&T				MADE GROUND: Greyish brown desiccated silty sand. Rare subangular fine to coarse gravel of brick, sandstone and rare glass and clinker. Occasional rootlets. (MADE GROUND TOPSOIL)	
				0.40			?Dense light yellowish brown friable clayey slightly gravelly SAND. Gravel is angular tabular fine to medium of sandstone. (GRANULAR RESIDUAL SOIL)	
		0.90	D		0.80		Weak light brown fine grained SANDSTONE. Recovered as angular tabular fine to medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE)	
		1.00						
					1.50		1.5m Unable to drill further into bedrock. End of borehole at 1.50 m	

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Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Project Name: Manor Farm, Otey Road

 Project No.
2827

Co-ords: -

 Hole Type
WS

Location: Adel, Leeds

Level:

 Scale
1:20

Client: Titchmarsh & Bagley

Dates: 05/09/2017 - 05/09/2017

 Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	J,K&T				TOPSOIL: Dark brown sandy clayey silt. Occasional rootlets. (TOPSOIL)	
		0.70	D		0.60		Firm light brown sandy slightly gravelly CLAY. (COHESIVE RESIDUAL SOIL)	
		1.00		N=25 (5,5/5,6,7,7)				
		1.90 2.00	D	N=200 (15,37/50,50,50,50)	1.80		Moderately weak yellow fine to medium grained SANDSTONE. Recovered as angular tabular fine to medium gravel of sandstone. (MILLSTONE GRIT SANDSTONE)	
				2.20 2.20			2.2m Unable to drill further into bedrock. End of borehole at 2.20 m	

Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.

Borehole Log

Borehole No.

WS19

Sheet 1 of 1

Project Name: Manor Farm, Otey Road

Project No.
2827

Co-ords: -

Hole Type
WS

Location: Adel, Leeds

Level:

Scale
1:20

Client: Titchmarsh & Bagley

Dates: 05/09/2017 - 05/09/2017

Logged By
GLM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	J		0.25		MADE GROUND: Black sandy subangular fine to medium GRAVEL of macadam chippings and occasional sandstone. (GRANULAR HARDSTANDING)	
		0.30	J		0.40		MADE GROUND: Dark grey sandy silty CLAY. (RELICT TOPSOIL)	
		0.70	D				Dense light yellowish brown slightly clayey gravelly fine SAND. Gravel is subangular fine to medium of sandstone. (GRANULAR RESIDUAL SOIL)	
		1.00		N=136 (13,14/15,21,50,50)	1.50			
		End of borehole at 1.50 m						

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Remarks

1. Prior to drilling a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during drilling.