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NS/C4380/9728

24th November 2020

Bellway Homes Limited (North West)
2 Alderman Road
Liverpool
Merseyside
L24 9LR

For the attention of Mr A Johnson

Dear Adrian

Re: Lathom Pastures (Phase 2), Skelmersdale – Mineral Assessment Report

Minerals Policy (Local and National)

The National Planning Policy requires Mineral Planning Authorities to safeguard mineral resources that are or may become of economic importance by including them is a Mineral Safeguarding Area. The aim of them is to ensure mineral resources are adequately and effectively considered in land use planning decisions, to ensure that they are not needlessly sterilised by non-mineral development.

The following resources have been used in this assessment:

- Minerals Planning Guidance 15: Provision of Silica Sand in England (2006).
- Lancashire Minerals & Waste Local Plan, Site Allocation and Development Management Policies – Part One (September 2013).
- Lancashire Minerals & Waste Local Plan, Guidance Note on Policy M2 – Safeguarding Minerals (Minerals Safeguarding Area) (December 2014).
- British Geological Survey (BGS) 1:50,000 Scale Geological Maps Sheet 84, Wigan. Solid and Drift Edition.
- BGS Mineral Resource Mapping – Lancashire (comprising Lancashire, Boroughs of Blackpool and Blackburn with Darwen) at 1:100,000 scale.
- BGS Mineral Resource Information in Support of National, Regional and Local Planning: Merseyside (2006).
- West Lancashire 2012-20127 Local Plan Policies Map.
- GroundTech Consulting, Preliminary Environmental Risk Assessment (ref. 19255/1167_1.1, dated December 2019).
- Brownfield Solutions Ltd, Geo-Environmental Assessment Report (ref. TM/C4380/9070 Rev A, April 2020). The Exploratory Hole Plan and Logs are appended for reference.

Policy M2 within Lancashire Minerals & Waste Local Plan states:

"Within these mineral safeguarding areas identified, planning permission will not be supported for any form of development that is incompatible by reason of scale, proximity and permanence with working the minerals, unless the applicant can demonstrate to the satisfaction of the local planning authority that:

1) *The mineral concerned is no longer of any value or has been fully extracted. The full extent of the mineral can be extracted satisfactorily prior to the incompatible development taking place.*

2) *The incompatible development is of a temporary nature and can be completed and the site returned to its original condition prior to the minerals being worked.*
3) *There is an overarching need for the incompatible development that outweighs the need to avoid the sterilisation of the mineral resource.*
4) *That prior extraction of minerals is not feasible due to the depth of the deposit.*
5) *Extraction would lead to land stability problems."*

Lancashire Minerals & Waste Local Plan, Guidance Note on Policy M2 states the following:

"Policy M2 seeks to prevent the needless sterilisation of mineral resources by non-minerals development. Clearly there are many forms of development that, by their nature, will not lead to the sterilisation of mineral resources. Proposals which are excluded from these considerations are:

1) *Development already permitted by the General Development Order.*
2) *Development where outline planning permission has already been granted.*
3) *Development within the curtilage of existing developments.*
4) *Temporary development, unless in close proximity to an active quarry or permitted reserve of minerals."*

The sections below seek to provide evidence to confirm that the proposed development satisfies Policy M2 of the council's Minerals & Waste Local Plan.

Summary of Published Geological Information

An extract has been taken from the BGS 1:50,000 Scale Geological Map Sheet 84 (Wigan), which indicates the superficial and bedrock geology in the vicinity of the site.

The map indicates the site is underlain by superficial deposits of the Shirley Hill Sand Formation, this stratum typically comprises sand. The formation is widely known to be a source of Silica Sand used in the manufacture of glass. A drawing detailing the Superficial Geology at the site is presented in drawing C4380/07.

The bedrock underlying the site comprises the Pennine Lower Coal Measures Formation – Mudstone.

As detailed within the West Lancashire 2012-2027 Local Plan Policies Map and the BGS GeoIndex Onshore interactive map for Minerals, a small section of land in northern half of the site falls within an area of Safeguarded land for Silica Sand associated with the Shirdley Hill Sands as presented in drawing C4380/08.

However, the Mineral Resource Information in Support of National, Regional and Local Planning's Mineral Resources Map for Lancashire details that the site is not within a Mineral Safeguarding Area, but within an area where either a valid or expired mineral planning permission exists, this is understood to relate to Bloguegate Silica Sand.

Ground Conditions Summary

As detailed in the Geo-Environmental Risk Assessment report (ref. TM/C4380/9070 Rev A, dated April 2020) undertaken by BSL, the ground conditions typically comprised natural sandy clay or gravelly clayey sand topsoil over fine to coarse sand to circa 1.00mbgl, which was underlain by generally firm to stiff slightly gravelly slightly sandy clay.

In the Mather & Blundell, Hurst and Peet areas in the south, the superficial sands were present up to a maximum of 2.50mbgl and were generally loose. Running sand conditions were common in the shallow superficial sands in this area of the site. The shallow natural sands were typically underlain by a thin layer of clayey peaty sand, locally peat, observed up to a maximum thickness of 10cm.

Underlying the shallow natural sands and peat (where present), were interbedded soft to firm clays and medium dense sands to 4.45mbgl.

Based on the exploratory hole location plan, four locations were undertaken within the Mineral Safeguarding Area in the north of the site (WS04, TT03, TP06, RO01). Sand was encountered within TT03 and TP06 at depths from 0.35m bgl to 0.95m bgl and on average 0.425m in thickness. The sand in these exploratory holes were noted to be clayey fine to coarse sand. WS04 encountered a fine to medium sand between 0.50m and 0.70m bgl. Sand was not encountered within RO01.

The shallow bedrock underlying the site comprised extremely weak to very weak light grey mudstone. The depth to bedrock ranged from 2.00mbgl in the far north-west to 10.60mbgl in the far south-east, with a gradual increase in the thickness of superficial cover towards the south-east. The bedrock comprised interbedded mudstones, siltstones and sandstones with coal seams.

Two coal seams were encountered beneath the site; the Rushy Park Seam between 0.40m and 0.70m in thickness and the Bone Mine Seam between 0.50m and 1.30m in thickness. Based on the flush return during rotary drilling, the coal underlying the site was generally intact except for in RO08, when a total loss of flush was recorded at the approximate depth the Bone Mine Seam is expected to have been encountered.

Groundwater was encountered in every exploratory hole and was typically encountered within the top 0.50mbgl.

The Coal Authority and Coal Resources

BSL are not aware if the Coal Authority has been consulted with regards to the proposed development and the potential sterilisation of a safeguarded mineral resource.

It should be noted that within the Non-Residential Mining Report obtained as part of the Desk Study Assessment revealed worked seams underlying the site. The coal mining investigation has confirmed the presence of two coal seams present at shallow depths beneath the site; the Rushy Park Seam between 0.40m and 0.70m in thickness and the Bone Mine Seam between 0.50m and 1.30m in thickness. The coal seams were generally intact; however, evidence of underground workings within the Bone Mine Seam was identified in RO08 and appears to correlate with the location of recorded underground workings underlying the site.

RO08 is located in the centre of the site, and within the Mineral Safeguarding Zone present in the north of the site. Coal measures in this area revealed 0.40m thickness of intact coal was encountered between 23.50m and 23.90m bgl, representative of the Rushy Park seam and is not considered to be of workable thickness beneath the site.

Environmental Acceptability

UK legislation states that *"…mineral operators should look to agree a programme of work with the mineral planning authority which takes account, as far as is practicable, the potential impacts on the local community and local environment (including wildlife), the proximity to occupied properties, and legitimate operational considerations over the expected duration of operations…"*

UK wide guidance generally recommends that a 100m buffer zone should be introduced between any residential receptors and the point of proposed extraction. Furthermore, the Lancashire Mineral & Waste Local Plan Guidance note on Policy M2 – Safeguarding Minerals (Minerals Safeguarding Areas) states the following:

"Small ribbons or isolated occurrences of mineral resource are unlikely to be economic to work and so sterilisation may not be an issue. Likewise, if the surrounding area is developed to such an extent that

it makes the potential extraction of minerals uneconomic it can be considered that the mineral resource is already sterilised; for example if the area contains scattered houses, or fields broken up by roads, that reduce the amount of free land potentially developable for a quarry."

The area of the site demarked as a Minerals Safeguarding Area is located to the south of Old Engine Road and within 100m of a number of scattered dwellings and in line with the above, is considered to already be sterilised. The presence of scattered housing and roads suggests that it is unlikely that planning permission for a silica sand quarry at the site would be granted.

Old Engine Road is a narrow single laned track and not designed for heavy traffic suggesting that the use of the site for mineral extraction would have a significant impact on the local area, which must be taken into account when an assessment is made to determine the practical suitability of the site for mineral extraction.

Economic Viability

The superficial sand deposits underlying the area of the site classified as a Minerals Safeguarding Area is noted to be between 0.20m and 0.60m in thickness. The composition of sand bands varies across the site with differing quantities of minor constituents including clay which are not considered suitable composition for silica sand. It is noted that from across the majority of the site the superficial deposits are largely cohesive rather than granular, suggesting that even if the wider site was to be included in the Minerals Safeguarding Area it would not provide sufficient yield of Silica Sand to be economically viable.

Furthermore, to reach the sand and extract it in advance of any site development works, it would be necessary to remove the topsoil and any overlying cohesive deposits and temporarily stockpile this on the site for the duration of the mineral extraction phase, which has the potential to cause nuisance from visual intrusion, dust generation and sound nuisance. Following the completion of any mineral extraction, engineered fill would need to be brought onto the site to supplement the superficial soils to ensure that the ground conditions would support the future construction of residential properties.

In addition, a suitable stand-off including possible benching or battering of excavations from Old Engine Road to the north and residential properties surrounding the Minerals Safeguarding Area onsite would also be required in order to reach the expected depth. This would further reduce the potential area of sand to be extracted.

Assessment

An area in the north of the site is noted to lie within a Minerals Safeguarding Area assumed to be for Silica Sand, that being said, Local Authority documentation acknowledges that the site, in its entirety, it earmarked for residential development and that the presence of sporadic houses and roads within the area suggests that the land has already been sterilised.

The ground conditions encountered during the site investigation identified the presence of sands underlying the site from depths of 0.35m and 0.95m bgl with an average thickness of approximately 0.40m which is unlikely to be significantly thick to be commercially viable for extraction.

As detailed above, the sand deposits are considered to be of poor quality as they were noted to contain varying quantities of clay and other constituents further reducing their economic value given the apparent poor sorting and grading of these deposits. Given the constraints identified at the site, it is considered highly unlikely that extraction of any deposits will be economically viable.

Based on the above, BSL believes there is no reasonable justification to retain the site for minerals extraction.

We trust the above meets your requirements. If you have any queries, then please do not hesitate to contact the undersigned.

Yours sincerely
For Brownfield Solutions Ltd

Written by:

Nicola Swallow
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Senior Project Engineer
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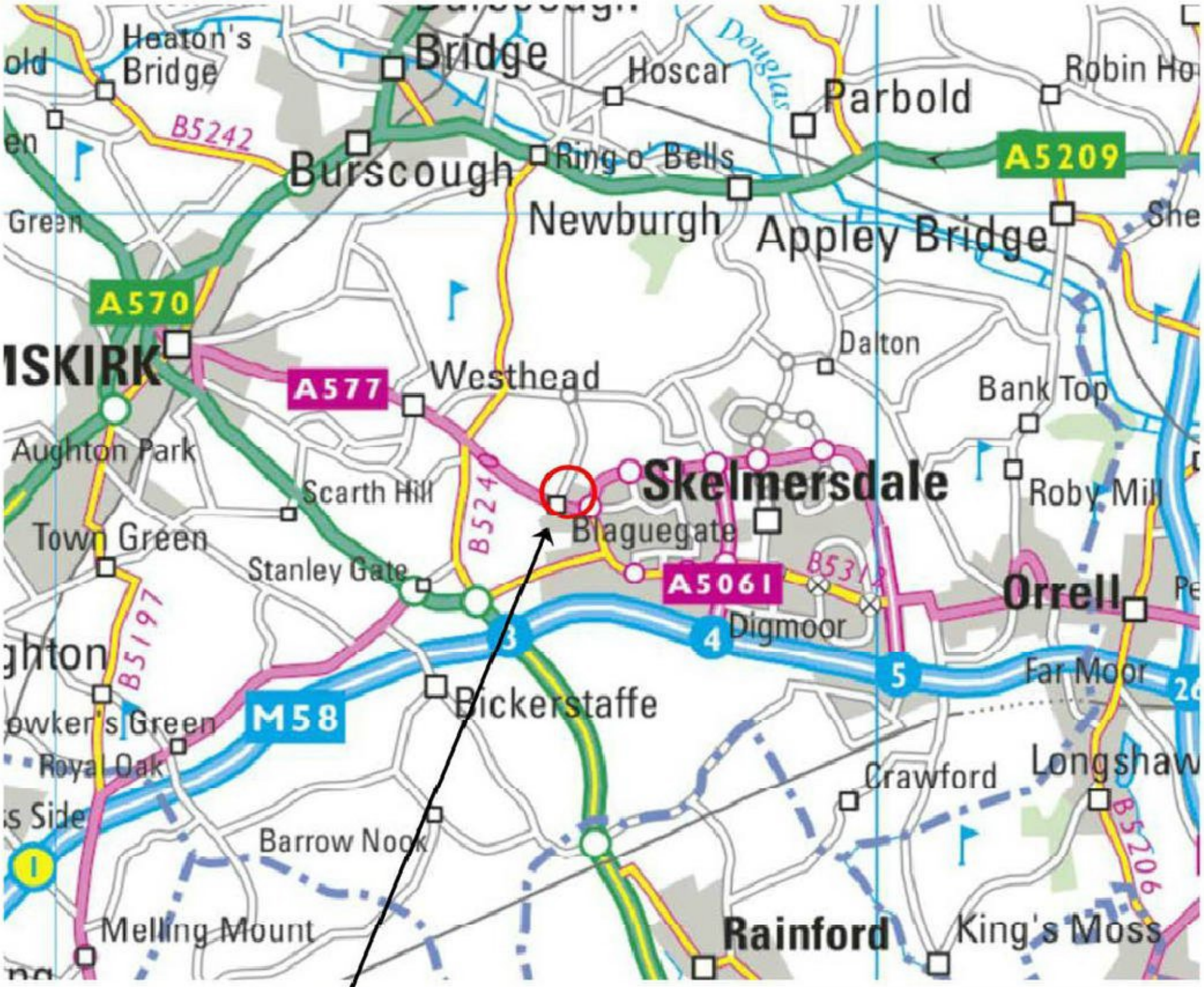
Checked and approved by:

A J Stokoe
BSc (Hons) CSci MIEnvSc FGS
Principal Project Engineer
CSci Chartered Scientist

Enc C4380_01 – Site Location Plan
C4380_03 – Exploratory Hole Location Plan
C4380_07 – Superficial Geology Map
C4380_08 – Mineral Resources Plan
BSL Exploratory Hole Logs



REV	DATE	DESCRIPTION	BY	CKD

BROWNFIELD SOLUTIONS LTD

CLIENT
BELLWAY HOMES LTD (NW)

PROJECT TITLE
FIRSWOOD ROAD, SKELMERSDALE

DRAWING TITLE
SITE LOCATION PLAN

DRAWING No	REVISION	SCALE	DATE
C4380/01	-	NTS	10/02/20

DRAWN BY	CHECKED BY
SD	JMC

KEY

- TPXX — TRIAL PIT
- TTXX — TRIAL TRENCH
- WSXX — WINDOW SAMPLE BOREHOLE
- ROXX — ROTARY OPEN BOREHOLE
- CONJECTURED COAL SEAM
- BOREHOLE INSTALLATION
- POSSIBLE BADGER SETT INCLUDING 20M STAND OFF

NOTES

1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS REPORTS. THIS DRAWING IS COPYRIGHT OF BSL.
3. DRAWING NOT FOR CONSTRUCTION PURPOSES.

REV	DATE	DESCRIPTION	BY	CKD
A	21/11/19	UPDAT: FOLLOWING BSL WALKOVER	JMC	AS
B	15/12/19	UPDAT: FOLLOWING DRILLER WALKOVER	TM	JMC
C	21/01/20	UPDAT: FOLLOWING INTRUSIVE INVESTIGATION	TM	JMC

BROWNFIELD SOLUTIONS LTD

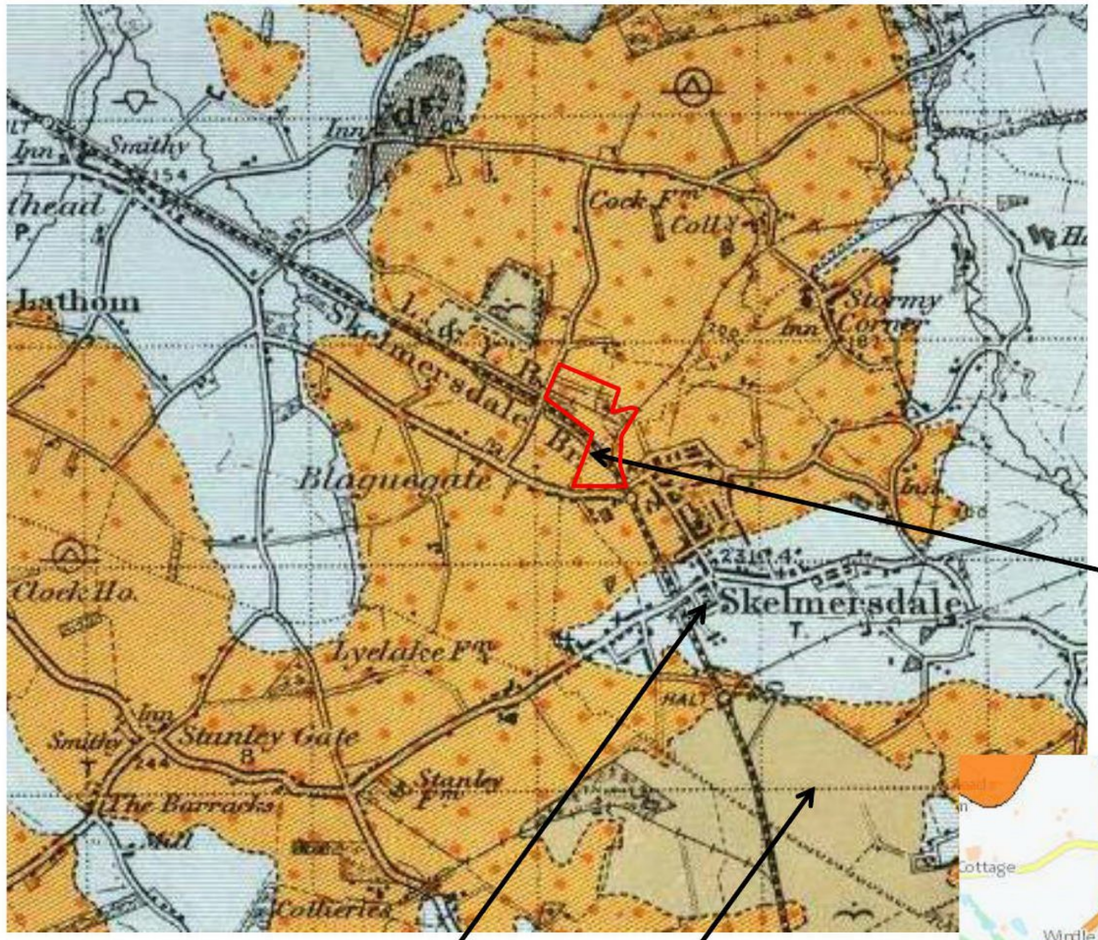
CLIENT
BELLWAY HOMES LTD (NW)

PROJECT TITLE
LATHOM PASTURES (PHASE 2)

DRAWING TITLE
EXPLORATORY HOLE LOCATION PLAN

DRAWING No.	REVISION	SCALE	DATE
C4380/03	C	NTS	21/01/20

DRAWN BY	CHECKED BY
TM	JMC

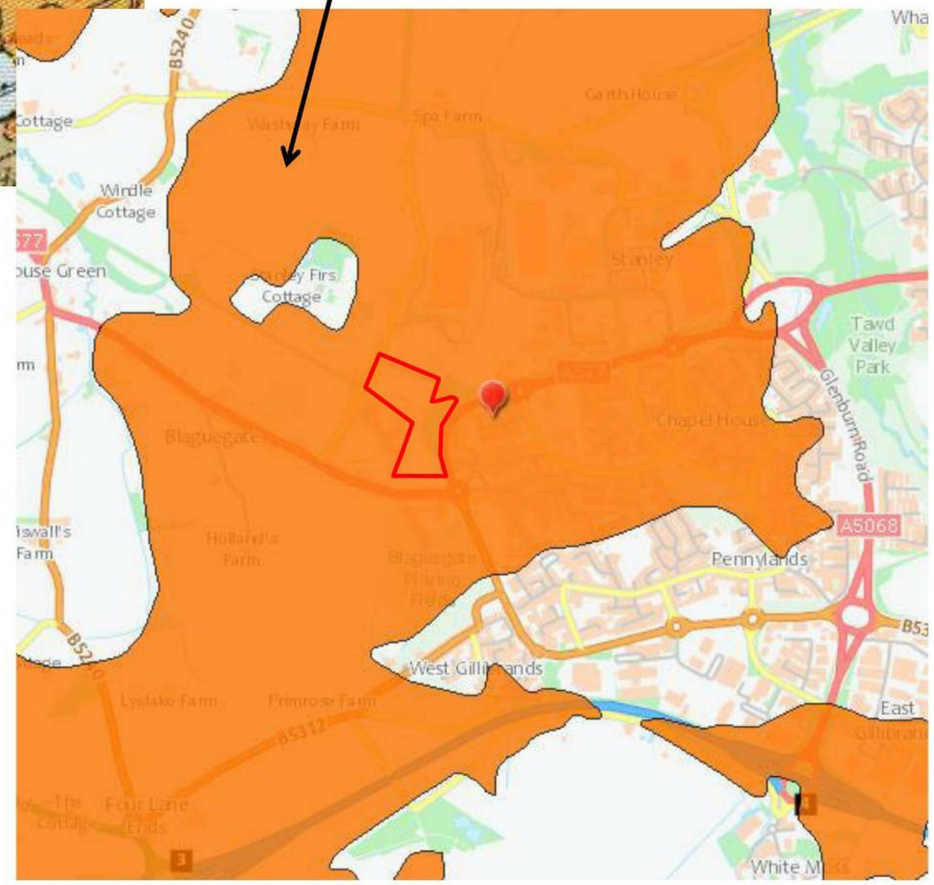


EXTRACT FROM 1:50,000 SCALE GEOLOGICAL MAPS SHEET 84 WIGAN, 1970. DRIFT EDITION.

SHIRDLEY HILL SAND (POTENTIAL SILICA SAND SAFEGUARDING AREA)

DEVENSIAN TILL

PEAT



EXTRACT FROM BGS GEOINDEX ONSHORE INTERACTIVE VIEWER – MINERALS (SILICA SAND).

KEY

APPROXIMATE SITE BOUNDARY

REV	DATE	DESCRIPTION	BY	CKD

BROWNFIELD SOLUTIONS LTD
GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

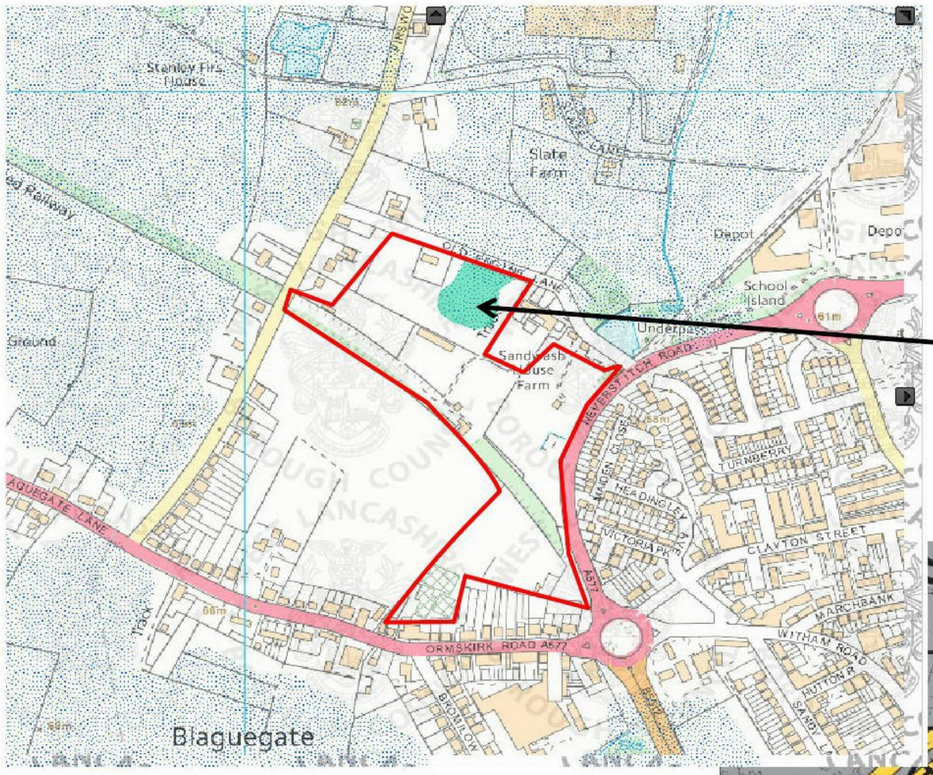
CLIENT: BELLWAY HOMES LIMITED (NORTH WEST)

PROJECT TITLE: LATHOM PASTURES (PHASE 2), SKELMERSDALE

DRAWING TITLE: SUPERFICIAL GEOLOGY MAP

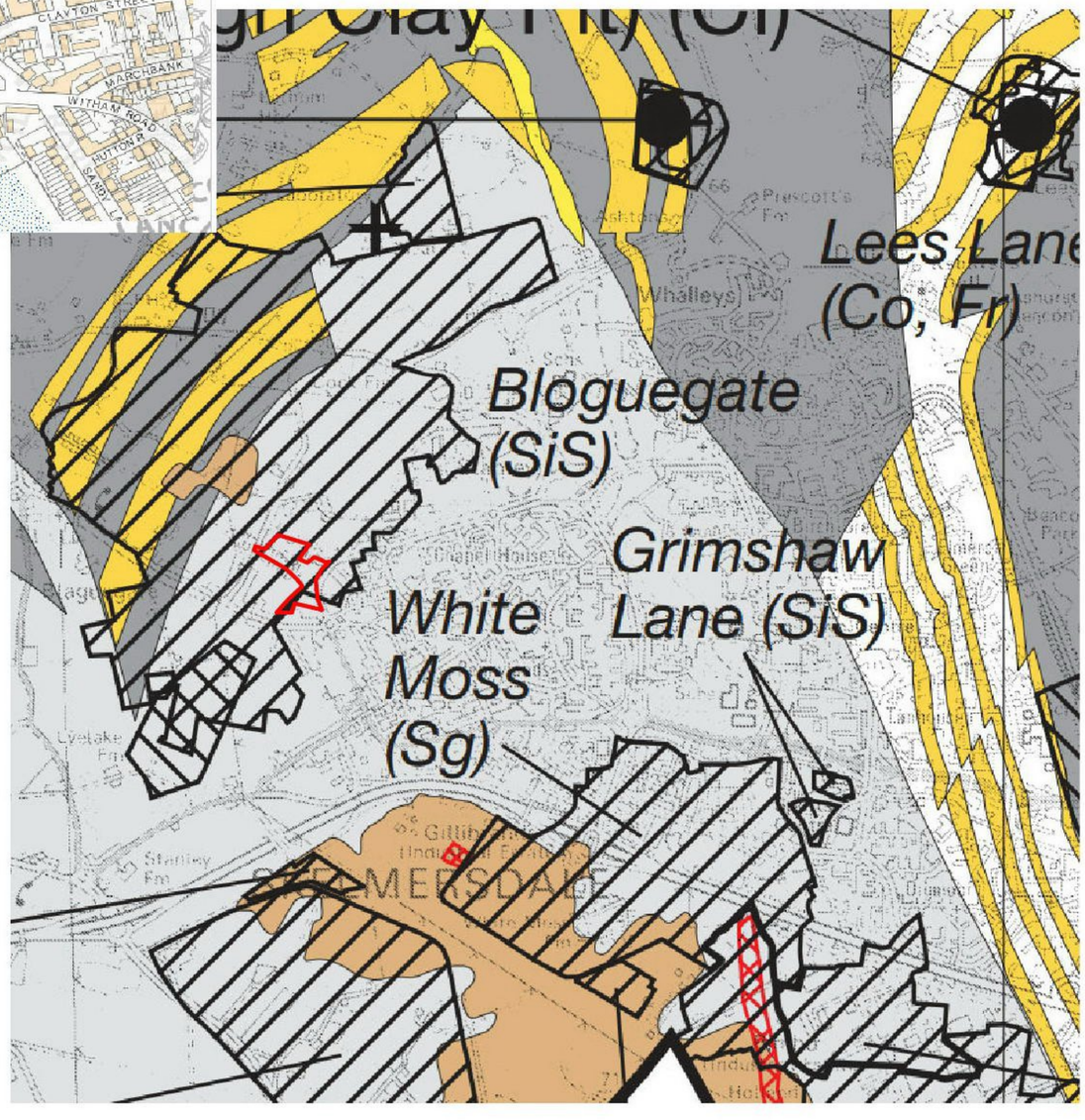
DRAWING No.	REVISION	SCALE	DATE
C4380/07	-	NTS	18/11/20

DRAWN BY	CHECKED BY
NS	AJS



EXTRACT FROM WEST LANCASHIRE 2012-2027 LOCAL PLAN POLICIES MAP

ONSITE MINERAL SAFEGUARDING AREA



MINERAL PLANNING PERMISSION (as at 30.09.05)

Source: Mineral Planning Authorities

Surface planning permission (valid and expired)

Underground planning permission other than coal (valid and expired)

MINERAL WORKINGS

Bankfield — Active site

Preesall — Inactive (including yet to be worked), worked-out and/or restored site

Mineral commodity

Cl	Clay & Shale	Peat	Peat	Sg	Sand and Gravel
Co	Coal	MSg	Marine sand and gravel		
Fr	Fireclay	San	Sand	Sst	Sandstone
Lst	Limestone	Salt	Salt	SiS	Silica Sand

▲ Active underground mine ♦ Active marine aggregate wharf

EXTRACT FROM BGS MINERAL RESOURCE MAPPING – LANCASHIRE (COMPRISING LANCASHIRE, BOROUGHS OF BLACKPOOL AND BLACKBURN WITH DARWEN) AT 1:100,000 SCALE

KEY

APPROXIMATE SITE BOUNDARY

REV	DATE	DESCRIPTION	BY	CKD

BROWNFIELD SOLUTIONS LTD
GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

CLIENT: BELLWAY HOMES LIMITED (NORTH WEST)

PROJECT TITLE: LATHOM PASTURES (PHASE 2), SKELMERSDALE

DRAWING TITLE: MINERAL RESOURCES PLAN

DRAWING No.	REVISION	SCALE	DATE
C4380/08	-	NTS	18/11/20

DRAWN BY	CHECKED BY
NS	AJS

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Trial Pit Log

No. **TP01**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346186E, 406803N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.20m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type: TP

Scale: 1:25

Logged	Checked
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.00	62.20		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
				0.40	61.80		Greyish brown clayey fine to coarse SAND.
▼				0.60	61.60		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.00	ES HSV	78kPa				
	1.50	D					
	2.00	HSV	92kPa				
	2.50	D		2.45	59.75		Very weak light grey MUDSTONE, partially weathered.
	3.00	ES		3.00	59.20		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks

1. Groundwater ingress at 0.60mbgl.
2. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

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Trial Pit Log

No.
TP02
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346175E, 406749N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.30m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.40	60.90		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
	0.80	ES		0.90	60.40		Greyish brown clayey fine to coarse SAND.
	1.00	D HSV	73kPa				Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	HSV	92kPa				
	2.50	HSV	107kPa				
	2.80	D		2.75	58.55		Very weak light grey MUDSTONE, partially weathered.
				3.30	58.00		End of Trial Pit at 3.30m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.40mbgl.
2. Sides slightly collapsing between 0.45mbgl and 0.90mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

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Trial Pit Log

No.
TP03
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346146E, 406737N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	
TP	
Scale	
1:25	
Logged	**Checked**
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.35	62.15		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
▼	0.80	ES					Brownish orange fine to medium SAND.
				1.05	61.45		
	1.20	HSV	73kPa				Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D					
	2.00	HSV	89kPa				
	2.50	D		2.50	60.00		Very weak light grey MUDSTONE, partially weathered.
				3.00	59.50		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.80mbgl.
2. Sides slightly collapsing between 0.35mbgl and 1.05mbgl.
3. Backfilled with arisings upon completion.

E3 = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

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Trial Pit Log

No. **TP04**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346166E, 406698N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type: TP

Scale: 1:25

Logged	Checked
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.30	62.20		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
	0.80	ES					Brownish orange fine to medium SAND.
				1.05	61.45		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D HSV	69kPa				
	2.00	HSV	70kPa				
	2.50	D HSV	111kPa				
				2.90	59.60		Very weak light grey MUDSTONE, partially weathered.
				3.30	59.20		End of Trial Pit at 3.30m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.50mbgl.
2. Sides slightly collapsing between 0.30mbgl and 1.05mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

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Trial Pit Log

No. **TP05**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346190E, 406754N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	60.80m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type: TP

Scale: 1:25

Logged	Checked
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES					Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
				0.40	60.40		Greyish brown clayey fine to coarse SAND.
	0.80	ES		0.70	60.10		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.00	HSV	73kPa				
	1.50	D					
	2.00	HSV	85kPa				
	2.50	HSV	109kPa				
	2.80	D		2.70	58.10		Very weak light grey MUDSTONE, partially weathered.
				3.30	57.50		End of Trial Pit at 3.30m

1.0 2.0 3.0 4.0 5.0

Remarks

1. Groundwater ingress at 0.30mbgl.
2. Sides slightly collapsing between 0.40mbgl and 0.70mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

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Trial Pit Log

No.
TP06
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346261E, 406728N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	60.60m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	
TP	
Scale	
1:25	
Logged	**Checked**
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.35	60.25		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
	0.50	ES		0.60	60.00		Greyish brown clayey fine to coarse SAND.
	1.00	HSV	73kPa				Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D					
	2.00	HSV	91kPa				
	2.50	D					
	3.00	HSV	100kPa	3.05	57.55		End of Trial Pit at 3.05m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.40mbgl.
2. Backfilled with arisings upon completion.

E3 = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP07
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346267E, 406626N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.30m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.30	ES		0.45	61.85		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).	
	0.80	ES					Greyish brown clayey fine to coarse SAND.	
	1.00	HSV	73kPa	0.90	61.40		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.	1.0
	1.50	D						
	2.00	D HSV	92kPa					2.0
	3.00	HSV	103kPa					3.0
				3.30	59.00		End of Trial Pit at 3.30m	
								4.0
								5.0

Remarks

1. Groundwater ingress at 0.50mbgl.
2. Sides slightly collapsing between 0.45mbgl and 0.90mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP08
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346276E, 406650N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.60m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type	
TP	
Scale	
1:25	
Logged	**Checked**
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.35	62.25		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
▼	0.60	ES					Greyish brown clayey fine to coarse SAND.
	1.00	HSV	79kPa	1.10	61.50		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D					
	2.00	HSV	88kPa				
	2.50	D					
	3.00	HSV	109kPa	3.00	59.60		End of Trial Pit at 3.00m

Remarks

1. Groundwater ingress at 0.50mbgl.
2. Sides readily collapsing between 0.35mbgl and 1.10mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP09
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346342E, 406676N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.40m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
TP	
Scale	
1:25	
Logged	**Checked**
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.20	ES		0.45	60.95		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.50	ES					Orangish brown clayey fine to coarse SAND
	1.50	D HSV	71kPa	1.40	60.00		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	HSV	111kPa				
	2.50	D					
	3.00	HSV	120kPa				
				3.40	58.00		End of Trial Pit at 3.40m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.30mbgl.
2. Sides readily collapsing between 0.45mbgl and 1.40mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP10
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346316E, 406634N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.30m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
TP	
Scale	
1:25	
Logged	**Checked**
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.40	61.90		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.80	ES					Orangish brown clayey fine to coarse SAND.
	1.50	D HSV	72kPa	1.40	60.90		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	D HSV	100kPa				
	3.00	HSV	120kPa				
				3.40	58.90		End of Trial Pit at 3.40m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.20mbgl.
2. Sides readily collapsing between 0.40mbgl and 1.40mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP11
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346288E, 406585N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.90m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
TP	
Scale	
1:25	
Logged	**Checked**
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.40	62.50		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.80	ES					Brown clayey fine to coarse SAND.
	1.20	D HSV	67kPa	1.10	61.80		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	D HSV	128kPa				
	3.00	HSV	130kPa				
				3.30	59.40		End of Trial Pit at 3.50m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.40mbgl.
2. Sides slightly collapsing between 0.40mbgl and 1.10mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No. **TP11A**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346322E, 406578N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	63.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.40	63.10		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.50	ES					Brown clayey fine to coarse SAND.
	1.20	D HSV	75kPa	1.10	62.40		Firm to stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	D HSV	99kPa				
	3.00	HSV	127kPa				
	3.30	HSV	130kPa	3.30	60.00		End of Trial Pit at 3.50m

1.0
2.0
3.0
4.0
5.0

Remarks

1. No groundwater encountered.
2. Sides slightly collapsing between 0.40mbgl and 1.10mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No. **TP12**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346339E, 406526N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	63.10m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
TP	
Scale	
1:25	
Logged	**Checked**
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.35	62.75		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.50	ES					Orangish brown clayey fine to coarse SAND.
	1.00	HSV	84kPa	0.95	62.15		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.20	D					
	2.00	D HSV	123kPa				
	3.00	HSV	130kPa				
				3.10	60.00		End of Trial Pit at 3.10m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.20mbgl.
2. Sides slightly collapsing between 0.35mbgl and 0.95mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No. **TP12A**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346337E, 406506N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	63.00m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type: TP

Scale: 1:25

Logged	Checked
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.40	62.60		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.80	ES					Greyish brown clayey fine to coarse SAND.
	1.50	D HSV	65kPa	1.30	61.70		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	D HSV	91kPa				
	3.00	HSV	107kPa	3.05	59.95		End of Trial Pit at 3.05m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.20mbgl.
2. Sides slightly collapsing between 0.40mbgl and 1.30mbgl.
3. Backfilled with arisings upon completion.

E3 = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No. **TP13**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346333E, 406593N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.20m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type: TP

Scale: 1:25

Logged	Checked
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES					MADE GROUND: Grass over dark brown clayey fine to coarse sand topsoil with rootlets.
				0.40	61.80		MADE GROUND: Greyish brown slightly gravelly clayey fine to coarse sand. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
	0.80	ES					*Railway sleeper (timber) at 0.80mbgl with a faint hydrocarbon odour.*
				0.85	61.35		Greyish brown slightly gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
	1.00	HSV	74kPa	1.00	61.20		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D					
	2.00	D HSV	96kPa				
	2.80	HSV	120kPa				
				2.90	59.30		End of Trial Pit at 2.90m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.30mbgl.
2. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No. **TP14**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346370E, 406624N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.60m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type: TP

Scale: 1:25

Logged: JM **Checked:** JMC

Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
▼	0.30	ES		0.45	61.15		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	1.00	ES					Greyish brown slightly gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
	1.30	HSV	71kPa	1.25	60.35		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D					
	2.00	HSV	120kPa				
	2.50	D					
	3.00	HSV	130kPa	3.00	58.60		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks

1. Groundwater ingress at 0.20mbgl.
2. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No. **TP15**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346388E, 406643N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.30m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
TP	
Scale	
1:25	
Logged	**Checked**
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.20	ES		0.30	61.00		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.80	ES					Greyish brown slightly gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
	1.20	HSV	64kPa	1.20	60.10		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D					
	2.00	D HSV	73kPa				
	3.00	HSV	127kPa	3.00	58.30		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.30mbgl.
2. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No. **TT01**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346174E, 406820N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.20m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type: TP

Scale: 1:25

Logged	Checked
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.35	61.85		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
	0.80	ES					Greyish brown clayey fine to coarse SAND.
				1.05	61.15		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D HSV	79kPa				
				2.20	60.00		Very weak light grey MUDSTONE partially weathered, recovered as a gravelly clay with medium cobble content.
	2.50	D					
				4.20	58.00		End of Trial Pit at 4.20m

1.0 2.0 3.0 4.0 5.0

Remarks

1. Groundwater ingress at 0.20mbgl.
2. Sides readily collapsing between 0.35mbgl and 1.05mbgl.
3. Trench excavated in attempt to locate coal seam. Dimensions 7.00m by 0.80m.
4. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TT02
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346142E, 406811N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.80m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
▼	0.20	ES		0.40	61.40		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
	1.00	ES		1.05	60.75		Greyish brown clayey fine to coarse SAND.
	1.50	D HSV	75kPa				Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.50	D		2.00	59.80		Very weak light grey MUDSTONE partially weathered, recovered as a gravelly clay with medium cobble content.
				4.15	57.65		End of Trial Pit at 4.15m

1.0 2.0 3.0 4.0 5.0

Remarks

1. Groundwater ingress at 0.30mbgl.
2. Sides readily collapsing between 0.40mbgl and 1.05mbgl.
3. Trench excavated in attempt to locate coal seam. Dimensions 8.00m by 0.80m.
4. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TT03
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346293E, 406775N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	0.20	ES		0.35	61.15		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
▼	0.50	ES					Greyish brown clayey fine to coarse SAND.
	1.00	HSV	66kPa	0.95	60.55		Firm brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	D HSV	94kPa				*Becoming stiff from 2.00mbgl.*
	2.50	D					
	3.00	HSV	99kPa				
	4.00	HSV	125kPa				
				4.95	56.55		End of Trial Pit at 4.95m

Remarks

1. Groundwater ingress at 0.60mbgl.
2. Sides readily collapsing between 0.35mbgl and 0.95mbgl.
3. Trench excavated in attempt to locate coal seam. Dimensions 10.20m by 0.80m.
4. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No. **TT04**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346260E, 406700N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.70m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type: TP

Scale: 1:25

Logged	Checked
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES					Grass over dark brown slightly gravelly slightly clayey SAND with rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
				0.35	61.35		Greyish brown clayey fine to coarse SAND.
▼	0.50	ES		0.55	61.15		Firm brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.00	HSV	90kPa				*Becoming stiff from 1.00mbgl.*
	2.00	D HSV	122kPa				
	3.00	HSV	122kPa				
	4.00	HSV	130kPa				
	4.65	D		4.65	57.05		Black COAL.
				4.85	56.85		End of Trial Pit at 4.85m

Remarks

1. Groundwater ingress at 0.55mbgl.
2. Sides readily collapsing between 0.35mbgl and 0.55mbgl.
3. Trench excavated in attempt to locate coal seam. Dimensions 10.30m by 0.80m.
4. Coal seam encountered at base of trial trench with an outcrop length of 1.0m, dipping towards the south-east. Thickness not proven due to reach of plant equipment. Bedrock outcropping east and west of the seam comprised extremely weak to very weak light grey mudstone partially weathered.
5. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TT05
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346211E, 406658N	**Hole Type**	
				TP	
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	60.29m OD	**Scale**	
				1:25	
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20	**Logged**	**Checked**
				TM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES		0.25	60.04		Black fine to medium SAND with rootlets. (TOPSOIL)
	0.60	ES					Orange fine to medium SAND.
▼				0.85	59.44		Soft to firm light grey sandy CLAY. Sand is fine to medium.
	1.00	D HSV	46kPa				*Becoming firm from 1.00mbgl.*
							Becoming brown and slightly gravelly from 1.40mbgl. Gravel is subangular to subrounded fine to coarse of mudstone.
	2.00	D HSV	102kPa				*Becoming stiff from 2.00mbgl.*
	3.40	D		3.40	56.89		Black COAL.
				3.50	56.79		End of Trial Pit at 3.50m

1.0 2.0 3.0 4.0 5.0

Remarks

1. Groundwater encountered with medium flow at 0.80mbgl.
2. Sides readily collapsing between 0.40mbgl and 1.50mbgl.
3. Coal seam encountered at base of trial trench with an outcrop length of 1.0m, dipping towards the south-east. Bedrock outcropping east and west of the seam comprised extremely weak to very weak light grey partially weathered mudstone.
4. Unable to excavate deeper than 3.50mbgl due to large collapse of trench sides and reach of JCB-3CX.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS01
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346168E, 406793N	**Hole Type**	
				WS	
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.30m OD	**Scale**	
				1:30	
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20 - 16/01/20	**Logged**	**Checked**
				TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	ES					Black brown clayey fine to medium SAND with rootlets. (TOPSOIL).
		0.50	ES		0.40	61.90		Reddish brown fine to medium SAND.
		1.00	ES		0.70	61.60		Soft light grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and sandstone.
		1.20	SPT	N=5 (1,1/1,1,1,2)				
		2.00	SPT	N=24 (2,3/4,5,7,8)				*Becoming stiff from 2.00mbgl.*
		2.40	D					
		2.50	SPT	N≥50 (25 for 30mm/50 for 10mm)	2.50 2.54	59.80 59.76		Very weak light grey MUDSTONE, partially weathered. End of Borehole at 2.54m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with medium flow at 0.20mbgl.
3. Casing installed from GL to 2.00mbgl.
4. Borehole installed: GL to 0.50m plain, 0.50m to 2.50m slotted, 2.50m to 2.54m backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS02
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346184E, 406740N	**Hole Type**	
				WS	
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.40m OD	**Scale**	
				1:30	
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20	**Logged**	**Checked**
				TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	ES		0.30	61.10		Black brown clayey fine to medium SAND with rootlets. (TOPSOIL).
					0.50	60.90		Reddish brown fine to medium SAND.
		0.60	ES					Soft light grey slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of mudstone and sandstone.
		1.20	D SPT	N=4 (1,1/1,1,1,1)				*Becoming reddish brown from 1.20mbgl.*
								Becoming firm from 1.70mbgl.
		2.00	SPT	N=12 (1,2/3,3,3,3)				
		2.20	D		2.25	59.15		Extremely weak light grey MUDSTONE, partially weathered.
		3.00	SPT	N=14 (8,7/4,3,3,4)				
		3.70	D					
		4.00	SPT	N≥50 (9,14/50 for 200mm)				
					4.35	57.05		End of Borehole at 4.35m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.20mbgl.
3. Casing installed from GL to 2.00mbgl.
4. Backfilled with arisings.

ES = Environmental sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS03
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346264E, 406697N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.00m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description	
	▼	0.20	ES		0.35	61.65		Black brown clayey fine to coarse SAND with rootlets. (TOPSOIL).	
		0.50	ES					Light brown slightly gravelly fine to coarse SAND. Gravel is subrounded fine to medium of mudstone.	
		1.20	ES SPT	N=5 (1,1/1,1,1,2)	1.00	61.00		Soft light grey brown slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of mudstone and sandstone. *Becoming reddish brown from 1.20mbgl.* *Becoming firm from 1.50mbgl.*	1.0
		2.00-2.45 2.00	D SPT	N=7 (1,1/1,2,2,2)					2.0
		3.00 3.45 3.00	D SPT	N=9 (1,2/2,2,2,3)					3.0
		4.00	SPT	N=16 (2,3/3,4,4,5)				*Becoming stiff from 4.00mbgl.*	4.0
					4.45	57.55		End of Borehole at 4.45m	5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.30mbgl.
3. Casing installed from GL to 2.00mbgl.
4. Backfilled with arisings.

ES = Environmental sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS04
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346269E, 406781N	**Hole Type**	
				WS	
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.41m OD	**Scale**	
				1:30	
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20	**Logged**	**Checked**
				TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
	▼	0.20	ES					MADE GROUND: Black slightly gravelly fine to coarse sand topsoil with low cobble content. Gravel is angular to subrounded fine to coarse of brick, mudstone, sandstone and coal. Cobbles are angular to subangular up to 80mm in diameter of brick.	
					0.50	61.91		Reddish brown fine to medium SAND.	
					0.70	61.71		Soft light grey slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of mudstone and sandstone.	1.0
		1.20-1.65	D						
		1.20	SPT	N=7 (1,1/1,2,2,2)				*Becoming brown from 1.40mbgl.*	
								Becoming firm from 1.60mbgl.	
		2.00	SPT	N=12 (1,2/3,3,3,3)					2.0
		2.80	D						
		3.00	SPT	N=7 (1,1/1,2,2,2)					3.0
		3.20	D						
		4.00	SPT	N≥50 (3,3/50 for 220mm)					4.0
					4.20	38.21		Extremely weak light grey MUDSTONE, partially weathered.	
					4.37	58.04		End of Borehole at 4.37m	
									5.0
									6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.20mbgl.
3. Casing installed from GL to 2.00mbgl.
4. Backfilled with arisings.

ES = Environmental sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS05
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346235E, 406654N	**Hole Type**	
				WS	
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	59.59m OD	**Scale**	
				1:30	
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20	**Logged**	**Checked**
				TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES		0.50	59.09		Black clayey fine to medium SAND. (TOPSOIL)
	▼	0.70	ES					Reddish brown fine to medium SAND.
		1.20	SPT	N=7 (1,1/1,2,2,2)	1.20	58.39		Soft light orangish grey slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of mudstone and sandstone. Occasional wood fragments.
		1.40	ES					
		2.00	SPT	N=6 (1,1/1,1,2,2)				
		2.50	D					
		3.00	SPT	N=15 (2,3/3,4,4,4)				*Becoming stiff from 3.00mbgl.*
		4.00-4.45	D		4.00	55.59		
		4.00	SPT	N=14 (2,2/3,3,4,4)				Extremely weak light grey MUDSTONE, partially weathered.
					4.45	55.14		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.80mbgl, rising to 0.45mbgl after 20 minutes.
3. Casing installed from GL to 2.00mbgl.
4. Borehole installed: GL to 1.00m plain, 1.00m to 3.00m slotted, 3.00m to 4.45m backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.: **WS06**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346350E, 406637N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.60m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type: WS

Scale: 1:30

Logged: TM **Checked:** JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	▼	0.30	ES		0.70	60.90		Black-brown very sandy CLAY with roots and rootlets. Sand is fine to coarse. (TOPSOIL).
		0.80	ES					Brown fine to medium SAND.
		1.20	SPT	N=4 (0,0/1,1,1,1)				Loose from 1.20mbgl.
		1.80	D		1.70	59.90		Firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone.
		2.00	SPT	N=12 (1,1/2,3,3,4)				
		3.00	SPT	N=21 (3,3/4,5,6,6)	3.00	58.60		
					3.10	58.50		Brown fine to medium SAND.
		3.20	D					Stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone.
		4.00	SPT	N=23 (4,4/5,5,6,7)				
					4.45	57.15		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.50mbgl.
3. Running sands encountered between 0.70mbgl and 1.70mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Borehole installed: GL to 1.00m plain, 1.00m to 4.00m slotted, 4.00m to 4.45m backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS07
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346308E, 406396N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.94m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.30	ES					MADE GROUND: Black-brown slightly gravelly very sandy clay topsoil. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of brick and mudstone.
		0.80	ES		0.70	61.24		Light brown fine to coarse SAND.
		1.20	SPT	N=8 (0,1/2,2,2,2)				*Loose from 1.20mbgl.*
		1.80	D		1.75	60.19		Brown clayey peaty fine to coarse SAND with natural organic odour.
		2.00	SPT	N=9 (2,2/2,3,2,2)	1.85	60.09		Soft to firm light grey-brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		2.50	D					*Becoming brown from 2.00mbgl.*
		3.00	SPT	N=16 (2,3/3,4,4,5)	2.90	59.04		Medium dense brown fine to medium SAND.
					3.40	58.54		Firm brown slightly sandy CLAY. Sand is fine to coarse.
					3.45	58.49		Brown fine to medium SAND.
		4.00	SPT	N=21 (3,4/5,5,5,6)	3.90	58.04		Stiff brown slightly sandy CLAY. Sand is fine to coarse.
					4.45	57.49		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.30mbgl.
3. Running sands encountered between 0.70mbgl and 1.75mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS08
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346296E, 406422N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.84m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.10	ES		0.40	61.44		MADE GROUND: Black brown slightly gravelly clayey fine to medium sand topsoil with roots and rootlets. Gravel is angular to subangular fine to coarse of mudstone and glass.
		0.50	ES					Light brown fine to medium SAND.
		1.20	SPT	N=4 (0,0/1,1,1,1)				*Sand becoming dark brown from 0.85mbgl.*
		1.90	ES		1.80	60.04		*Loose from 1.20mbgl.*
		2.00	SPT	N=4 (0,0/1,1,1,1)				Very soft to soft brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and sandstone.
		2.70	D					*Becoming firm from 2.60mbgl*
		3.00	SPT	N=21 (2,2/4,5,6,6)				*Becoming firm to stiff from 3.00mbgl.*
		3.80	D					
		4.00	SPT	N=13 (2,2/2,3,4,4)				
					4.45	57.40		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.10mbgl.
3. Running sands encountered between 0.40mbgl and 1.80mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS09
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346333E, 406343N	**Hole Type**	
				WS	
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.51m OD	**Scale**	
				1:30	
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	17/01/20	**Logged**	**Checked**
				SM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D ES		0.30	61.21		MADE GROUND: Grass over dark brown slightly gravelly slightly sandy clay topsoil with rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mudstone, sandstone, brick, plastic and rare glass.
		0.40	D ES		0.60	60.91		Dark grey slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded of brick and mudstone. Light brown fine to medium SAND.
		0.70	D ES					*Becoming brown from 0.80mbgl.*
	▼	1.00	D ES					1.0
		1.20	SPT	N=4 (0,1/1,1,1,1)				*Loose from 1.20mbgl.*
		1.60	D ES		1.55	59.96		
		1.80	D ES		1.65	59.86		Plastic dark brown fibrous PEAT. Organic odour.
		2.00	SPT	N=10 (1,1/2,2,3,3)				Soft mottled grey and brown silty CLAY.
		2.50	D					*Becoming firm from 1.90mbgl.*
		3.00	SPT	N=25 (2,3/6,6,6,7)				2.0
		3.20	D					*Becoming stiff from 2.50mbgl.*
		4.00	SPT	N=27 (5,5/5,7,7,8)				3.0
					4.45	57.06		4.0
								End of Borehole at 4.45m
								5.0
								6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 1.00mbgl.
3. Running sands encountered between 0.60mbgl and 1.55mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Borehole installed: GL to 1.00m plain, 1.00m to 4.00m slotted, 4.00m to 4.45m backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS10
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346365E, 406393N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.31m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	17/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
SM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.35	61.96		MADE GROUND: Grass over black slightly gravelly sandy clay topsoil with rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mudstone, occasional concrete, glass and plastic.
		0.50	D ES					Light brown fine to coarse SAND.
	▼	0.90	D ES					*Becoming brown from 0.80mbgl.*
		1.00	D ES					
		1.20	SPT	N=4 (0,0/1,1,1,1)				*Loose from 1.20mbgl.*
					1.50	60.81		Soft brown slightly gravelly silty CLAY. Gravel is fine to medium sub-rounded to angular of mudstone and sandstone.
		1.80	D ES					
		2.00	SPT	N=6 (0,0/1,1,2,2)				
		2.60	D					*Becoming firm from 2.50mbgl*
		3.00	SPT	N=15 (2,2/3,4,4,4)				*Becoming stiff from 2.80mbgl.*
		3.50	D					
		4.00	SPT	N=18 (3,3/4,4,5,5)				
					4.45	57.86		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.90mbgl.
3. Running sands encountered between 0.35mbgl and 1.50mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.: **WS11**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346290E, 406478N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.92m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type: WS

Scale: 1:30

Logged	Checked
TM	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	▼				0.30	61.62		very soft dark brown-black slightly gravelly very sandy CLAY with roots and rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and sandstone. (TOPSOIL)
		0.50	ES					Reddish brown-grey fine to medium SAND.
		1.20	SPT	N=4 (0,0/1,1,1,1)				*Loose from 1.20mbgl.*
		1.40	D					
					1.95	59.97		Brown clayey peaty SAND with natural organic odour.
		2.00	SPT	N=5 (0,0/1,1,1,2)	2.00	59.92		Very soft slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and rare coal.
					2.45	59.47		Soft slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and rare coal.
		2.90	D					
		3.00	SPT	N=14 (1,2/3,4,3,4)				*Becoming firm from 3.00mbgl.*
					3.45	58.47		Brown fine to medium SAND.
					3.90	58.02		Firm to stiff slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and rare coal.
		4.00	SPT	N=16 (2,2/3,4,4,5)				
					4.45	57.47		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.30mbgl.
3. Running sands encountered between 0.30mbgl and 1.95mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS12
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346271E, 406415N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.28m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES					MADE GROUND: Grass over black slightly gravelly clayey sand topsoil with rootlets and low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of brick, concrete and glass. Cobbles are subangular up to 80mm in diameter of brick and concrete.	
	▼				0.55	61.73		Light brown fine to coarse SAND.	
		0.90	ES					*Becoming brown from 1.00mbgl.*	1.0
		1.20	SPT	N=6 (0,1/1,1,2,2)				*Loose from 1.20mbgl.*	
								Becoming light grey from 1.50mbgl.	
		2.00	SPT	N=6 (1,1/1,1,2,2)					2.0
		2.10-2.45	D		2.10	60.18		Soft brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.	
		2.20	ES						
								Becoming firm from 2.80mbgl.	
		3.00	SPT	N=16 (2,3/3,4,4,5)	3.00	59.28		Brown fine to coarse SAND.	3.0
					3.15	59.13		Firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.	
					3.45	58.83		Brown fine to coarse SAND.	
					3.90	58.38			
		4.00	SPT	N=17 (2,2/3,4,5,5)				Firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.	4.0
					4.45	57.83		End of Borehole at 4.45m	
									5.0
									6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.55mbgl. Groundwater level in inspection pit rose from 1.00mbgl to 0.50mbgl in ten minutes.
3. Running sands encountered between 0.55mbgl and 2.10mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

PROJECT NO:	C4380	**CO-ORDS:**	346223E, 406421N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.55m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Window Sampler No.	
WS13	
Sheet 1 of 1	
Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	▼	0.20	ES		0.40	62.15		MADE GROUND: Grass over very soft black slightly gravelly slightly sandy clay topsoil with roots and rootlets. Sand is fine to coarse. Gravel is subangular fine of brick.
		0.50	ES					Light grey fine to medium SAND.
								Becoming light brown from 0.70mbgl.
		1.20	D SPT	N=2 (0,0/0,0,1,1)				*Very loose from 1.20mbgl.*
					1.80	60.75		
		1.90	D		1.85	60.70		Brown clayey peaty SAND with natural organic odour.
		2.00	SPT	N=5 (0,1/1,1,1,2)				Soft to firm light grey-brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		2.90	D					
		3.00	SPT	N=10 (2,2/2,2,3,3)				*Becoming firm from 3.00mbgl.*
		4.00	SPT	N=14 (2,2/3,3,4,4)				
					4.45	58.10		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with medium flow at 0.20mbgl.
3. Running sands encountered between 0.40mbgl and 1.80mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.: **WS14**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346248E, 406410N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.58m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	▼	0.40	ES					MADE GROUND: Grass over soft dark brown-black slightly gravelly very sandy clay topsoil. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of brick and concrete. *Isolated angular cobble of concrete at 0.20mbgl. 100mm in diameter.*
		0.80	ES		0.70	61.88		Dark brown slightly gravelly clayey fine to medium SAND with occasional rootlets.
		1.20	SPT	N=3 (0,0/0,1,1,1)				*Very loose from 1.20mbgl.*
		1.80	D					*Becoming light brown from 1.70mbgl.*
		2.00	SPT	N=4 (0,0/1,1,1,1)	2.05	60.53		Soft to firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		2.50	D					
		3.00	SPT	N=17 (2,3/3,4,5,5)	3.00	59.58		Medium dense brown fine to medium SAND.
		3.80	D		3.70	58.88		Soft to firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		4.00	SPT	N=14 (2,3/3,3,4,4)	4.00	58.58		Brown fine to medium SAND.
					4.20	58.38		Firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
					4.45	58.13		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.30mbgl. Groundwater level in inspection pit rose from 1.20mbgl to 0.30mbgl in ten minutes.
3. Running sands encountered between 0.70mbgl and 2.05mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.: **WS15**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346242E, 406386N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.64m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20	ES		0.10	62.54		MADE GROUND: Red cobbles of angular whole bricks 150mm in diameter.
	▼				0.45	62.19		MADE GROUND: Black slightly gravelly clayey fine to coarse sand. Gravel is angular to subrounded fine to coarse of brick, glass and concrete.
		0.60	ES					Light grey brown fine to medium SAND with mild hydrocarbon odour.
		1.20	SPT	N=4 (0,0/1,1,1,1)				*Loose from 1.20mbgl.*
								Becoming reddish brown from 1.30mbgl.
		1.95	D		1.90	60.74		
		2.00	SPT	N=6 (1,1/1,1,2,2)	2.00	60.64		Brown clayey peaty SAND with natural organic odour.
		2.20	D					Soft to firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		3.00	SPT	N=17 (2,2/3,4,5,5)				*Becoming stiff from 3.00mbgl.*
		3.60	D					
		4.00	SPT	N=17 (2,3/4,4,4,5)				
					4.45	58.19		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.50mbgl. Groundwater level in inspection pit rose from 1.20mbgl to 0.50mbgl in five minutes.
3. Running sands encountered between 0.45mbgl and 1.90mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Borehole installed: GL to 0.50m plain, 0.50m to 2.00m slotted, 2.00m to 4.45m backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS16
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346240E, 406363N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.77m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.10	62.67		MADE GROUND: Grass over black gravelly fine to coarse sand topsoil. Gravel is subangular to subrounded fine to coarse of mudstone.
		0.30	ES		0.20	62.57		MADE GROUND: Red cobbles of angular whole bricks 150mm in diameter.
					0.70	62.07		MADE GROUND: Black brown slightly gravelly clayey fine to coarse sand. Gravel is subangular to subrounded fine of mudstone and brick.
	▼	0.80	ES					Light brown fine to medium SAND with mild hydrocarbon odour.
								Becoming reddish brown from 0.8mbgl.
		1.20-1.65 1.20	D SPT	N=8 (1,1/1,2,2,3)				*Loose from 1.2mbgl.*
					1.80	60.97		
		1.90 2.00	D SPT	N=6 (0,1/1,1,2,2)				Soft light brown grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		3.00 3.15 3.00	D SPT	N=13 (2,3/3,3,3,4)				*Becoming firm from 3.00mbgl.*
		4.00	SPT	N=19 (2,3/4,4,5,6)				*Becoming stiff from 4.00mbgl.*
					4.40	58.37		Brown fine to medium clayey SAND.
					4.45	58.32		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 1.10mbgl.
3. Running sands encountered between 0.70mbgl and 1.80mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS17
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346246E, 406432N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.30m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	ES		0.30	62.00		very soft dark brown-black slightly gravelly very sandy CLAY with roots and rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and sandstone. (TOPSOIL)
		0.60	ES					Light grey fine to medium SAND.
								Becoming orangish brown from 0.90mbgl.
		1.20	SPT	N=4 (0,0/1,1,1,1)				*Loose from 1.20mbgl.*
		1.60	D					
		2.00	SPT	N=7 (1,1/1,2,2,2)				
					2.50	59.80		Soft brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and rare coal.
		2.60	D					
		3.00	SPT	N=10 (1,2/2,2,3,3)				
					3.20	59.10		Brown fine to medium SAND.
		3.50	SPT	N=13 (2,3/4,3,3,3)				*Medium dense from 3.50mbgl.*
					3.85	58.45		Soft brown slightly sandy CLAY. Sand is fine to coarse.
					3.95	58.35		End of Borehole at 3.95m

Remarks	
	1. Hand dug pit excavated to 1.20mbgl to check for buried services. 2. Groundwater ingress with medium flow at 0.20mbgl. Groundwater level in inspection pit rose from 1.00mbgl to 0.50mbgl after five minutes. 3. Running sands encountered between 0.30mbgl and 2.50mbgl. 4. Casing installed from GL to 2.00mbgl. 5. Borehole unable to be progressed beyond 3.95mbgl due to blowing sands. 6. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.: **WS18**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346263E, 406466N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.31m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	▼	0.30	ES		0.45	61.86		Black slightly gravelly very sandy CLAY with rootlets and roots up to 20mm in diameter. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and rare coal.
		0.50	ES					Brown fine to medium SAND.
		1.20	SPT	N=3 (0,0/0,1,1,1)				*Very loose from 1.20mbgl.*
					1.70	60.61		Brown clayey peaty SAND with natural organic odour.
					1.80	60.51		Soft brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and rare coal.
		2.00	SPT	N=7 (1,1/1,2,2,2)				*Becoming stiff from 2.00mbgl.*
		2.10	D					
								Becoming firm from 2.70mbgl.
		3.00	SPT	N=17 (2,2/3,4,5,5)				
		3.60	D					
		4.00	SPT	N=22 (3,4/5,6,7)				
					4.45	57.86		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.45mbgl. Groundwater level in inspection pit rose from 1.00mbgl to 0.60mbgl in fifteen minutes.
3. Running sands encountered between 0.45mbgl and 1.90mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Borehole installed: GL to 0.50m plain, 0.50m to 2.00m slotted, 2.00m to 4.45m backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS19
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346321E, 406462N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.66m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	ES		0.50	61.16		Black-brown clayey fine to medium SAND with rootlets. (TOPSOIL)
		0.60	ES					Brown fine to medium SAND.
		1.20	SPT	N=3 (0,0/0,1,1,1)				*very loose from 1.20mbgl.*
		1.60	D		1.45	60.20		Soft brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and sandstone.
		2.00	SPT	N=3 (0,0/0,1,1,1)				*Becoming very soft from 2.00mbgl.*
								Locally soft between 2.60mbgl and 3.00mbgl.
		3.00	SPT	N=16 (2,2/3,3,5,5)				*Becoming stiff from 3.00mbgl.*
		3.10	D					
		4.00	SPT	N=21 (3,3/4,5,6,6)				
					4.45	57.20		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.30mbgl.
3. Running sands encountered between 0.50mbgl and 1.45mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.: **WS20**

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346344E, 406416N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.61m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	17/01/20

Hole Type: WS

Scale: 1:30

Logged	Checked
SM	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.30	D ES					Dark brown slightly sandy clay topsoil with rootlets. Sand is fine to medium.
		0.55	D ES		0.50 0.60	61.11 61.01		Dark grey sandy CLAY. Sand is fine to medium. (TOPSOIL) Grey brown fine to medium SAND.
		0.80	D ES					
		1.20	SPT	N=5 (0,0/1,1,1,2)				Loose from 1.20mbgl.
		1.50	D		1.50 1.52	60.11 60.09		Plastic brown slightly sandy PEAT. Sand is fine to medium. Organic odour. Grey brown fine to medium SAND.
		2.00	SPT	N=5 (1,2/2,1,1,1)	2.00	59.61		Loose brown fine to medium SAND.
		2.50	D					
		2.80	D ES		2.60	59.01		Brown sandy CLAY. Sand is fine to medium.
		3.00	SPT	N=14 (1,2/3,3,4,4)	3.00	58.61		Medium dense brown fine to medium SAND.
		4.00	SPT	N=14 (2,2/3,3,4,4)				
					4.45	57.16		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.40mbgl, 2.00mbgl and between 3.00m to 3.50mbgl.
3. Running sands encountered between 0.60mbgl and 1.50mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS21
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346333E, 406396N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.80m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	17/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
SM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	D ES		0.35	61.44		MADE GROUND: Grass over dark brown slightly sandy clay topsoil with rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mudstone, flag stone, brick and plastic. *Flagging encoutered at 0.20mbgl.*
					0.60	61.20		MADE GROUND: Dark red brown clayey gravel. Gravel is medium to coarse sub-angular to subrounded of brick.
		0.80	D ES		0.90	60.90		Light brown fine to medium SAND.
		1.20	D ES SPT	N=3 (0,0/0,1,1,1)				Brown fine to medium SAND. *Very loose from 1.20mbgl.*
		2.00	SPT	N=5 (1,1/1,1,1,2)	2.10	59.70		Soft brown slightly sandy silty CLAY. Sand is fine to medium.
		2.60	D ES					
		3.00	SPT	N=11 (1,2/2,3,3,3)	3.00	58.80		Medium dense brown fine to medium SAND.
					3.45	58.34		End of Borehole at 3.45m

Remarks	1. Hand dug pit excavated to 1.20mbgl to check for buried services. 2. Groundwater ingress with small flow at 0.30mbgl. 3. Flagstones encountered at 0.20mbgl and former brick road encountered between 0.35m to 0.60mbgl. 4. Running sands encountered between 0.60mbgl and 2.10mbgl. 5. Casing installed from GL to 2.00mbgl. 5. Backfilled with arisings.	ES = Environmental sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO11

Sheet 2 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346295E, 406486N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.95m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20 - 20/01/20

Hole Type	
RO	
Scale	
1:100	
Logged	**Checked**
DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					22.00	39.95		Grey MUDSTONE.
					25.80	36.15		Grey SANDSTONE.
					30.00	31.95		Grey MUDSTONE.
								End of Borehole at 30.00m

21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress with small flow at 0.40mbgl.
3. Casing installed through superficial deposits to 10.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane