

Newlay Concrete Ltd
Thornhill Works
Calder Road
Dewsbury
WF12 9HY

BY EMAIL

Our Ref: NCL/03/WWjcl2

01st August 2024

Dear Sirs

Thornhill Works, Calder Road, Dewsbury
Proposed Concrete Batching Plant
Intrusive Coal Mining Investigation

A Coal Mining Risk Assessment was undertaken by ARP Geotechnical Ltd (reference NCL/03/JR, dated 17th May 2024). The report concluded that potential coal workings beneath the site pose a risk to ground stability, and a rotary borehole investigation was recommended to be carried out. In accordance with our commission, the recommended investigation was carried out on 25th July 2024. The findings of the investigation are reported below.

Background

The geological maps show the site to be underlain by undifferentiated strata (mudstones, siltstones and minor sandstones) of the Pennine Lower Coal Measures of the Carboniferous Period. No superficial deposits are indicated on or near the site, and no faults are shown on or near the site.

The nearest conjectured coal seam outcrop is approximately 50m to the south, trending east-northeast to west-southwest (the New Hards/Middleton Main Coal). Further south, approximately 90m from the site, is an unnamed coal seam outcrop, and a further coal seam outcrop is indicated 150m to the south (the Green Lane Coal). The Green Lane coal is above the New Hards Coal in the Generalised Vertical Section (GVS) shown on the maps and, as a result, the younging direction of the strata is to the south/southeast. This means these seams are above the site in the succession and will not, therefore, underlie the site.

Approximately 130m to the northwest is a conjectured outcrop of the Wheatley Lime Coal. This seam is below the site in the succession of strata and, as a result, will underlie the site. The GVS indicates further seams are present below the Wheatley Lime, although they do not outcrop within the fault block on which the site sits.



Details of the seams likely to be present beneath the site are listed below, in order of increasing depth.

Seam	Approximate Depth Beneath the Site	Seam Thickness	Coal Seam Potentially Within Influencing Distance of Surface?*
Unnamed Coal	7m	Unknown	YES
Wheatley Lime Coal	16m	0.7m-1.2m	YES#
Middleton Eleven Yards Coal	21m	0.0m-0.8m	No
Blocking Coal	38m	0.4m-0.6m	No

*Including cumulative impacts on overlying seams and based on a requirement for there to be overlying rock cover of at least 10x the extracted thickness, as measured from the top of the original seam roof. Less than this indicates the seam is within influencing depth of the surface.

#12m rock cover would be needed, and the depth to rock is not known. Additionally, the outcrop positions are conjectured, therefore the seam depths can only be conjectured.

In view of the above, it was concluded that there was a potential for unrecorded shallow workings within both the unnamed coal seam and the Wheatley Lime coal seam to pose a risk to ground stability under the new proposed concrete batching plant. In the light of this, it was recommended that a rotary drilling investigation should be carried out to check for any evidence of shallow workings in the area of the proposed new plant. Details of the investigation subsequently carried out are provided below.

Site Works

Three boreholes were drilled, using rotary openhole water flush techniques, by Demolition and Geotechnical Ltd on 25th July 2024. The boreholes were numbered BH1, BH2, and BH3, and were drilled to depths of between 16m and 20m, at the locations shown on the attached plan. The rotary boreholes were located within the footprint/immediately adjacent to the infrastructure associated with the proposed concrete batching plant. The investigation was designed, organised, and supervised (on a full-time basis) by ARP Geotechnical Ltd, and boreholes were logged by both the Engineer and the lead driller. The lead drillers logs are attached.

As part of an earlier Geo-Environmental investigation on 28th June 2024, six windowless sample boreholes were drilled to between 0.95m and 4.05m depth. These positions were spread across the development site which included positions to the west away from the proposed concrete plant infrastructure.

Ground Conditions and Stability Assessment

The investigation revealed made ground, over superficial deposits and residual soils, (the latter two referred to only as "clay" on the driller's logs) to depths of between 1.4m (BH3) and 1.5m (BH1). This was underlain by mudstone with sandstone bands. Two of the boreholes (BH1 and BH3) encountered broken or soft strata (indicative of underground workings), from depths of 12.5m and 11.8m respectively. The broken/soft zone was 1.0m thick in both BH1 and BH3.

Intact coal was encountered in BH2 at 12.2m to 13.0m, presumed to be the Wheatley Lime coal. There was no evidence of mine workings in BH2. No intact coal was identified in boreholes BH1 or BH3.



It is a generally accepted rule of thumb that workings in a seam will require some form of treatment (usually drilling and grouting), unless there is at least 10 times the seam thickness of rock cover above the original seam roof (not above the top of any migrated workings). Working on an assumption of a 0.8m (extracted) seam thickness indicated by the intact coal thickness encountered, there needs to be 8m of rock cover above the original seam roof.

A summary table, showing the rotary borehole investigation detailing an assessment of cover thickness is presented on the next page.

Rock Cover Thickness Assessment

BH	Depth to Rock (m)	Depth (m) to base of coal or workings	Depth to Original Roof (m)	Rock Cover to Original Seam Roof (m)	Comment on Rock Cover Thickness
BH 1	1.5	13.5(S)	12.7	11.2	sufficient
BH 2	1.4	13.0(IC)	12.2	10.8	sufficient
BH 3	1.4	12.8 (BG)	12.0	10.6	sufficient

BG = Broken Ground IC = Intact coal S = Soft Ground

From the above, it can be seen that there is sufficient cover in all locations. As stated previously, the rotary boreholes were located in the vicinity of the proposed concrete batching plant infrastructure on the eastern half of the site. During the earlier geo environmental investigation, WS4, WS5 and WS6 (the logs for which are attached), were drilled on the east of the site. Intact bedrock was encountered at depths of between 1.0m and 2.0m. Even assuming a worst-case depth to bedrock of 2m encountered on the east of the site, there would still be sufficient rock cover.

Windowless samples WS1, WS2 and WS3 were located in the western half of the site. At these positions, intact bedrock was encountered at 0.95m, 1.5m and 4.05m depth respectively. There is a potential for insufficient cover at WS3. However, no infrastructure is proposed at or near this location other than the application of concrete hardstanding. If any infrastructure is proposed in this location in the future, further investigation would be recommended.

Gas Monitoring

Old mine workings can contain harmful gases. Depending on the fracture state of the strata on the site, gases have the potential to migrate from underlying mine workings towards the surface. Therefore, gas monitoring is required to determine the level of risk from mine gases. During the original site investigation, three monitoring wells were installed to rockhead at depths of between 0.8m and 2.0m (at the locations shown on the attached site plan). The gas monitoring is currently ongoing and will be reported at a later date.

Conclusion

In the light of the above, coal mine workings identified from the rotary investigation have sufficient rock cover across the east of the site, where the proposed concrete batching plant and associated infrastructure are proposed. As a result, stabilisation treatment by injection of grout is not required for the new batching plant.



However, insufficient rock cover is estimated to be present at the location WS3 in the southwestern corner of the site. Presently, no structures or infrastructure are proposed at this location other than the application of concrete hardstanding. Therefore, no treatment would be required. However, further rotary investigation would be recommended to confirm the need for grout treatment if any structures or infrastructure would be proposed in this location in the future.

We trust the above information and enclosures meet your requirement. However, if you have any queries, please do not hesitate to contact us at your convenience.

Yours faithfully
for ARP GEOTECHNICAL LTD

William Watkins

Encs

TITLE
LOCATION PLAN

CLIENT
**NEWLAY CONCRETE LTD
THORNHILL WORKS, CALDER ROAD
DEWSBURY**

SITE
**THORNHILL WORKS, CALDER ROAD
DEWSBURY WF12 9HY**

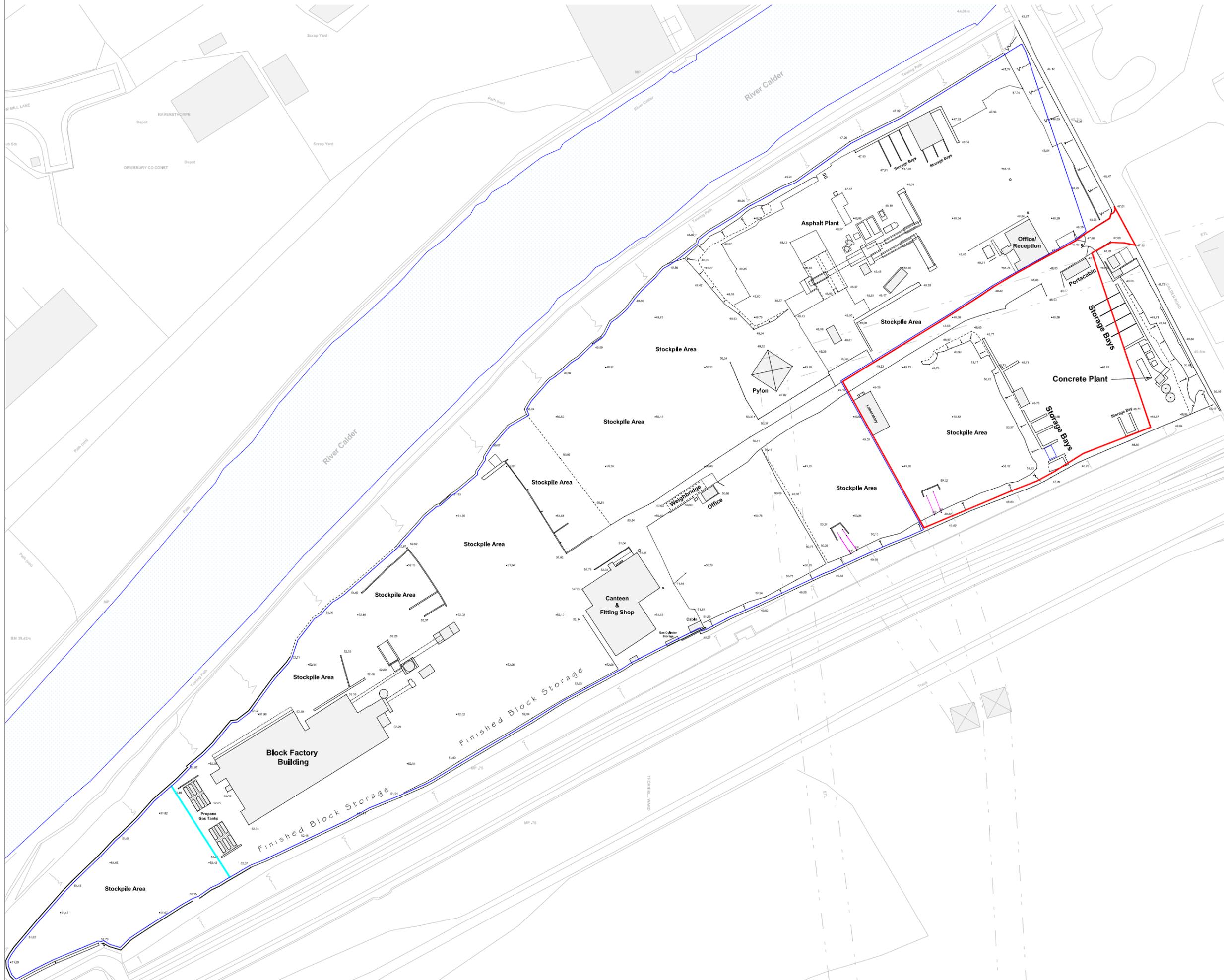
DATE	09/02/2024	DRAWN BY	CJB	CHECKED BY	CJB
DRAWING NO	20241/01	SCALE	1:1250 @ A3		

REV	AMENDMENT	DATE

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LEGEND

- Planning Application Boundary
- Land Under the Control of the Applicant





Minerals and Waste Planning
Environmental Permitting
Quarry Consultant

10 Dobroyd, Shepley, Huddersfield HD8 8AU
Tel: 01484 604026 Mobile: 07794 597515
cjb@mwplanning.co.uk

TITLE **LAYOUT PLAN**

CLIENT **NEWLAY READYMIX LTD
THORNHILL WORKS, CALDER ROAD
DEWSBURY**

SITE **THORNHILL WORKS, CALDER ROAD
DEWSBURY WF12 9HY**

DATE 09/02/2024 DRAWN BY CJB CHECKED BY CJB

DRAWING NO 20241/02 SCALE 1:500 @ A3

REV	AMENDMENT	DATE

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LEGEND

	Planning Application Boundary
	Concrete Pad



0m 20m

Approximate Scale

- (l) - Monitoring Install
-  ARP Window Sample Locations June 2024
-  ARP Rotary Borehole Locations 2024



ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS
 Northwest House 5-6 Northwest Business Park Servia Hill Leeds LS6 2QH
 Telephone : 0113 245 8498 Fax : 0113 244 3864 E-Mail : leeds@arpassociates.co.uk

Project **HORNHILL WORKS**
CALDER ROAD
DEWSBURY

Client
NEWLAY CONCRETE LTD

Title
SITE INVESTIGATION PLAN

Date
JULY 2024

Drawn WW	Scale AS SHOWN
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Job No.
NCL/03



Excavation Method Dando Terrier Window Sample Rig.	Dimensions	Ground Level (mOD)	Client Newlay Readymix Ltd	Job Number NCL/03
	Location	Dates 28/06/2024	Engineer W.W	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.40-0.40	D				(0.60)	MADEGROUND: Dark brown clayey very sandy fine to coarse subangular GRAVEL of brick sandstone and limestone with low cobble content. Sand is fine to coarse. Cobbles of brick.			
0.75-0.75	D		25,32/18		0.60 (0.20)	Extremely weak thinly laminated light grey silty MUDSTONE.			
0.80-1.17	D SPT 57*/120 18/250				0.80 (0.15) 0.95	Cone SPT test no recovery.			
						Complete at 0.95m			

Remarks Borehole finished due to SPT refusal at 0.95m on mudstone. Ground checked for services with CAT prior to drilling. No groundwater encountered. Monitoring well installed to 0.8m - slotted from base to 0.4m, with gravel surround, plain above, with bentonite seal. Bung, tap and locking cover provided.	Scale (approx)	Logged By
	1:25	W.W
	Figure No.	



Excavation Method Dando Terrier Window Sample Rig.	Dimensions		Ground Level (mOD)	Client Newlay Readymix Ltd	Job Number NCL/03
	Location		Dates 28/06/2024	Engineer W.W	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30-0.30	D				(0.60)	MADEGROUND: Dark brown clayey very sandy fine to coarse subangular GRAVEL of brick sandstone and limestone with low cobble content. Sand is fine to coarse. Cobbles of brick.		
0.70-0.70	D				0.60 (0.15) 0.75 0.80	Firm reddish brown slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.		
1.00-1.45	SPT N=43		6,9/7,6,10,20		(0.60)	COAL. Extremely weak thinly laminated light grey silty MUDSTONE.		
1.40-1.73	SPT 25*/80 50/245		22,3/50		1.40 (0.10)	Cone SPT test no recovery.		
1.50-1.50	D				1.50	Complete at 1.50m		

Remarks Borehole finished due to SPT refusal at 1.5m on mudstone. Ground checked for services with CAT prior to drilling. Backfilled with arisings upon completion. No groundwater encountered.	Scale (approx)	Logged By
	1:25	W.W
	Figure No.	



Excavation Method Dando Terrier Window Sample Rig.	Dimensions	Ground Level (mOD)	Client Newlay Readymix Ltd	Job Number NCL/03
	Location	Dates 28/06/2024	Engineer W.W	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00-1.45	SPT N=8		3,3/2,2,2,2			MADEGROUND: Dark brown clayey very sandy fine to coarse subangular GRAVEL of brick clinker sandstone and limestone with low cobble content. Sand is fine to coarse. Cobbles of brick. Occasional ash.		
2.00-2.45	SPT N=4		2,2/1,1,1,1		(3.90)			
3.00-3.45	SPT N=17		1,1/2,3,6,6					
4.00-4.35	SPT 75*/50 N=0		25,50/		3.90 (0.10) 4.00 4.05			
						Extremely weak thinly laminated light grey silty MUDSTONE.		
						Cone SPT test no recovery.		
						Complete at 4.05m		

Remarks Borehole finished due to SPT refusal at 4.05m on mudstone. Ground checked for services with CAT prior to drilling. Backfilled with arisings upon completion. No groundwater encountered.	Scale (approx)	Logged By
	1:25	W.W
	Figure No.	



Excavation Method
Dando Terrier Window
Sample Rig.

Dimensions

Ground Level (mOD)

Client
Newlay Readymix Ltd

Job Number
NCL/03

Location

Dates
28/06/2024

Engineer
W.W

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.70-0.70	D				0.20	CONCRETE			
1.00-1.45	SPT N=9		3,3/3,2,2,2		0.90	MADEGROUND: Dark brown clayey very sandy fine to coarse subangular GRAVEL of brick clinker sandstone and limestone with low cobble content. Sand is fine to coarse. Cobbles of brick. Occasional ash.			
1.40-1.40	D				1.10	REWORKED: Firm, medium strength, brown slightly sandy slightly gravelly clay. Sand is fine. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.			
2.00-2.41	SPT 50/255		10,10/25,25		1.60	Extremely weak thinly laminated light grey silty MUDSTONE.			
					2.00	Cone SPT test no recovery.			
					2.18	Complete at 2.18m			

Remarks
Borehole finished due to SPT refusal at 2.18m on mudstone.
Ground checked for services with CAT prior to drilling.
Monitoring well installed to 2.0m - slotted from base to 1.0m, with gravel surround, plain above, with bentonite seal. Bung, tap and locking cover provided.
No groundwater encountered.

Scale (approx)
1:25

Logged By
W.W

Figure No.



Excavation Method Dando Terrier Window Sample Rig.	Dimensions	Ground Level (mOD)	Client Newlay Readymix Ltd	Job Number NCL/03
	Location	Dates 28/06/2024	Engineer W.W	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30-0.30	D				(0.15) 0.15 (0.20) 0.35	CONCRETE MADEGROUND: Dark brown clayey very sandy fine to coarse subangular GRAVEL of brick sandstone and limestone with low cobble content. Sand is fine to coarse. Cobbles of brick.		
1.00-1.41	SPT 50/255		8,10/12,13,25		(0.25) 0.60 (0.30) 0.90 (0.10) 1.00 (0.33) 1.33	REWORKED: Firm, medium strength, brown slightly sandy slightly gravelly clay. Sand is fine. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Extremely weak thinly laminated dark grey shaley MUDSTONE with interbedded coal. Coal bands are 2-3mm thick. Extremely weak thinly laminated light grey silty MUDSTONE. Cone SPT test no recovery. Complete at 1.33m	 	

Remarks Borehole finished due to SPT refusal at 1.33m on mudstone. Ground checked for services with CAT prior to drilling. Backfilled with arisings upon completion. No groundwater encountered.	Scale (approx)	Logged By
	1:25	W.W
	Figure No.	



Excavation Method
Dando Terrier Window
Sample Rig.

Dimensions

Ground Level (mOD)

Client
Newlay Readymix Ltd

Job Number
NCL/03

Location
X=22 Y=

Dates
28/06/2024

Engineer
W.W

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.40-0.40	D				(0.20) 0.20	CONCRETE			
					(0.80)	REWORKED: stiff brown slightly sandy slightly gravelly clay. Sand is fine. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.			
1.00-1.45	SPT N=22		3,3/4,6,6,6		1.00	Stiff, high strength, reddish brown slightly sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse subangular to subrounded of mudstone.			
					(0.80)				
2.00-2.35	SPT 25*/80 50/265		20,5/50		1.80 (0.20) 2.00 (0.12) 2.12	Extremely weak thinly laminated light grey silty MUDSTONE.			
						Cone SPT test no recovery.			
						Complete at 2.12m			

Remarks

Borehole finished due to SPT refusal at 2.12m on mudstone.
Ground checked for services with CAT prior to drilling.
Monitoring well installed to 2.0m - slotted from base to 1.0m, with gravel surround, plain above, with bentonite seal. Bung, tap and locking cover provided.
No groundwater encountered.

Scale (approx)

1:25

Logged By

W.W

Figure No.

