



Haigh Huddleston & Associates

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Ground Stabilisation Completion Report

ON

PROPOSED RESIDENTIAL DEVELOPMENT

AT

NAB LANE, MIRFIELD

FOR

AW DEVELOPMENTS UK Ltd

JULY 2021

E21/7790/R002

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1.0 INTRODUCTION

- 1.1 As requested by Ground Support Services, this practice oversaw the drilling and grouting works undertaken at the proposed residential development at Nab Lane, Mirfield.
- 1.2 The purpose of the works are to:-
 - 1.2.1 Determine the extent of workings at shallow depth beneath the proposed development.
 - 1.2.2 Stabilise the ground via grouting to provide a suitable platform for the construction of the proposed development.
- 1.3 The on-site works have been undertaken by Ground Support Services, with site visits undertaken by engineers from Haigh Huddleston & Associates to oversee the works.
- 1.4 Preliminary investigation works to determine the presence of shallow workings have been undertaken by both Your Environment and are documented in their report Ref: YG0146-20 dated 14th February 2020 and Ground Support Services as detailed in Haigh Huddleston Report Ref: E21/7790/R001 dated July 2021.
- 1.5 Based on the findings detailed in the above reports, the works have been undertaken in accordance with:-
 - 1.5.1 CIRIA C758D – “Construction Over Abandoned Mine Workings”

2.0 THE SITE

- 2.1 The site is located on land to the south-west of the junction of Nab Lane and Bank Street, Mirfield and lies around OS Grid Reference 419294, 420546. A site location plan is attached in Appendix A at the rear of the report.
- 2.2 The site is approximately square in shape, with the northern and eastern boundaries formed by Nab Lane and Bank Street, respectively. There are residential properties immediately south and west of the site, and beyond the highways to the north and east.
- 2.3 The site consists of an open grassed area with a concrete flagged footpath running from the southeast to the northwest corner. There are remnants of a cobbled accessway to the site in the footpath on the southeastern corner. There is a post-box located in the northwestern corner of the site, a lamp-post in the centre of the northern boundary, two BT kiosks in the north eastern corner and an overhead telegraph line running from the south east to the north west above the footpath.
- 2.4 The site is open on the northern and eastern boundaries onto the adoptable highway and the southern and western boundaries are formed by a mix of stone and brick retaining walls and timber fence.
- 2.5 The site generally falls from a high point of 78.6m AOD in the north east to a low point of 75.6m in the south east at an average grade of 1 in 7. There is an average fall of 1 in 12 from east to west. The site is retained above the residential properties to the south and west.

3.0 PROPOSED SITE WORKS

- 3.1 As part of the investigation works by Your Environment, two rotary boreholes were undertaken using water flush methods to a depth of 20-30m. These boreholes generally proved 1.2-2.0m of made ground overlying bands of mudstone and sandstone to the base of the boreholes.
- 3.2 An intact 0.2-0.4m thick seam of coal was recorded in both boreholes at depths of 3.7-4.1m below existing ground levels. Additionally, 2.0-4.3m of broken ground was noted within the sandstone strata of both boreholes at depths of 10.2-14.5m below ground levels, with a 0.4m depth of void noted in one borehole at 14.1-14.5m.
- 3.3 The boreholes undertaken on site by Ground Support Services proved 0.7-2.7m of made ground overlying clays and sandstones to a depth of 4.1-4.6m below existing ground levels. Beneath the clays and sandstones were alternating bands of mudstone and sandstone to a depth of 20-30m beneath existing ground levels. A 0.8-1.4m thick band of fractured sandstone was encountered at 13.4-18.4m below existing ground levels in four of the six deep boreholes undertaken. Intact sandstone was recorded in the remaining two deep boreholes.
- 3.4 The broken ground and void encountered are indicators of potential shallow mine workings beneath the site when considering that coal has been encountered and it is an area of probable shallow workings. It was therefore considered prudent to undertake ground stabilisation works through drilling and grouting to the development.
- 3.5 The treatment works were carried out to confirm the depth and extent of potential shallow mine workings beneath the proposed residential development.
- 3.6 All works carried out on site were generally carried out in accordance with the specifications detailed in Section 1.5. An initial outline scope of works was agreed between the contractor and the client at an early stage.

- 3.7 The proposed stabilisation works consisted of the following steps:
- 3.7.1 The proposed drilling locations were based on the site investigation works by Cape Site Services
 - 3.7.2 Drilling would be progressed to beneath the worked strata, or intact coal seam, to prove solid strata beneath.
 - 3.7.3 Dependent on the findings from the borehole, more boreholes in the vicinity would be requested and centres reduced.
 - 3.7.4 All boreholes would then be grouted using a 10:1 Pulverised Fuel Ash (PFA): Ordinary Portland Cement (OPC) grout mix delivered by gravity.

4.0 DRILLING PROCEDURE

- 4.1 The boreholes were undertaken using a Casagrande C6 rotary percussive drilling rig using water flush methods due to the proximity of the adjacent plot.
- 4.2 Each borehole was drilled at a pre-determined location based on the 3m grid shown on drawing E21/7790/200A enclosed in Appendix A.
- 4.3 The site was visited to monitor the ongoing works. When it was not possible to visit site, log sheets were scanned and emailed by the drilling contractors to enable the plans to be updated. In addition to this, any unusual logs were reported immediately to enable additional drilling to be agreed to ensure comprehensive coverage of the area.
- 4.4 The ground conditions encountered in each borehole are recorded in the log sheets included in Appendix B.

5.0 GROUND CONDITIONS AND VALIDATION WORKS

- 5.1 The boreholes generally proved similar strata showing 1.4-2.9m of made ground overlying 1.6-3.2m of clays and 4.2-5.4m of mudstone with a sandstone bedrock encountered at 8.9-1.0m below existing ground levels.
- 5.2 Broken ground/fractured sandstone between 0.6m and 6.5m in depth was encountered at 8.9-16.1m below existing ground levels. No voids were recorded during the ground stabilisation works.
- 5.3 The majority of boreholes took less than 0.55 tonnes of grout, with only five boreholes recording takes of greater than 1 tonne. The peak take of 2.64 tonnes in C6 was associated with a 4.7m depth of broken ground/fractured sandstone.
- 5.4 Four of the six test holes proved grout, with the remaining two encountering solid strata. All six boreholes took less than 0.22 tonnes of grout indicating the previous grout works had been successful.

6.0 GROUTING PROCEDURE

- 6.1 Boreholes were fed a 1:10 OPC:PFA mix under gravity.
- 6.2 The boreholes were filled until grout appeared at the surface. This was allowed to settle over a 24 hour period and further grout fed into the boreholes if necessary. This was repeated until there was no further settlement within the borehole recorded over a 24 hour period.
- 6.3 Flow and bleed tests were undertaken on site.
- 6.4 The grout take for the boreholes generally varied from 0.11 tonnes where solid strata was encountered to 2.64 tonnes in areas of broken ground/fractured sandstone.
- 6.5 Grout cubes for testing were submitted to a UKAS accredited laboratory.

7.0 VALIDATION

- 7.1 All of the cubes tested surpassed the 0.7MN/m² required by day 28. The results of the testing are in Appendix D of the report.
- 7.2 Bleed tests and flow tests were undertaken regularly during the grouting works. The results of the tests are included on the grouting logs.
- 7.3 The bleed tests returned results of 3.7-5%, which are at or below the 5% maximum recommended for grout when treating abandoned mine workings.
- 7.4 The slump tests returned results of 350-500mm, which are within the values of 300-600mm recommended for grout when treating abandoned mine workings.
- 7.5 We would therefore conclude that the ground stabilisation for the site has been completed satisfactorily by grouting as stated in paragraph 1.2.2 of this report.

APPENDIX A

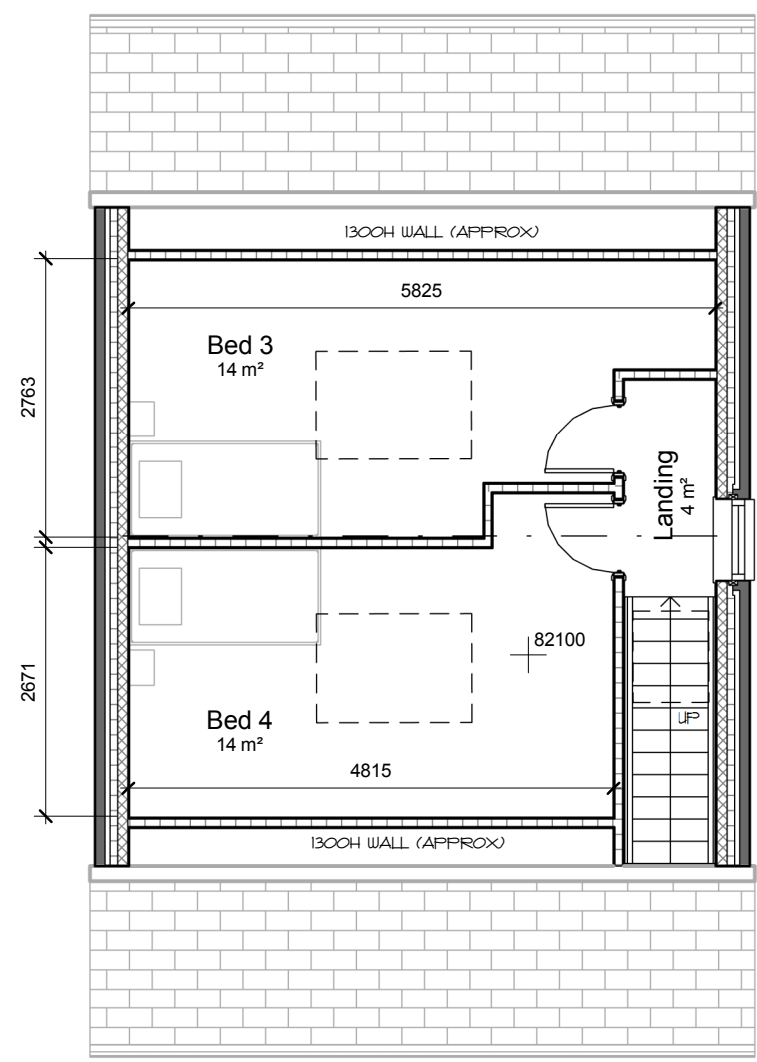
Site Location Plan

Site Plan

Dwg No. E21/7790/200A – Drilling and Grouting Plan

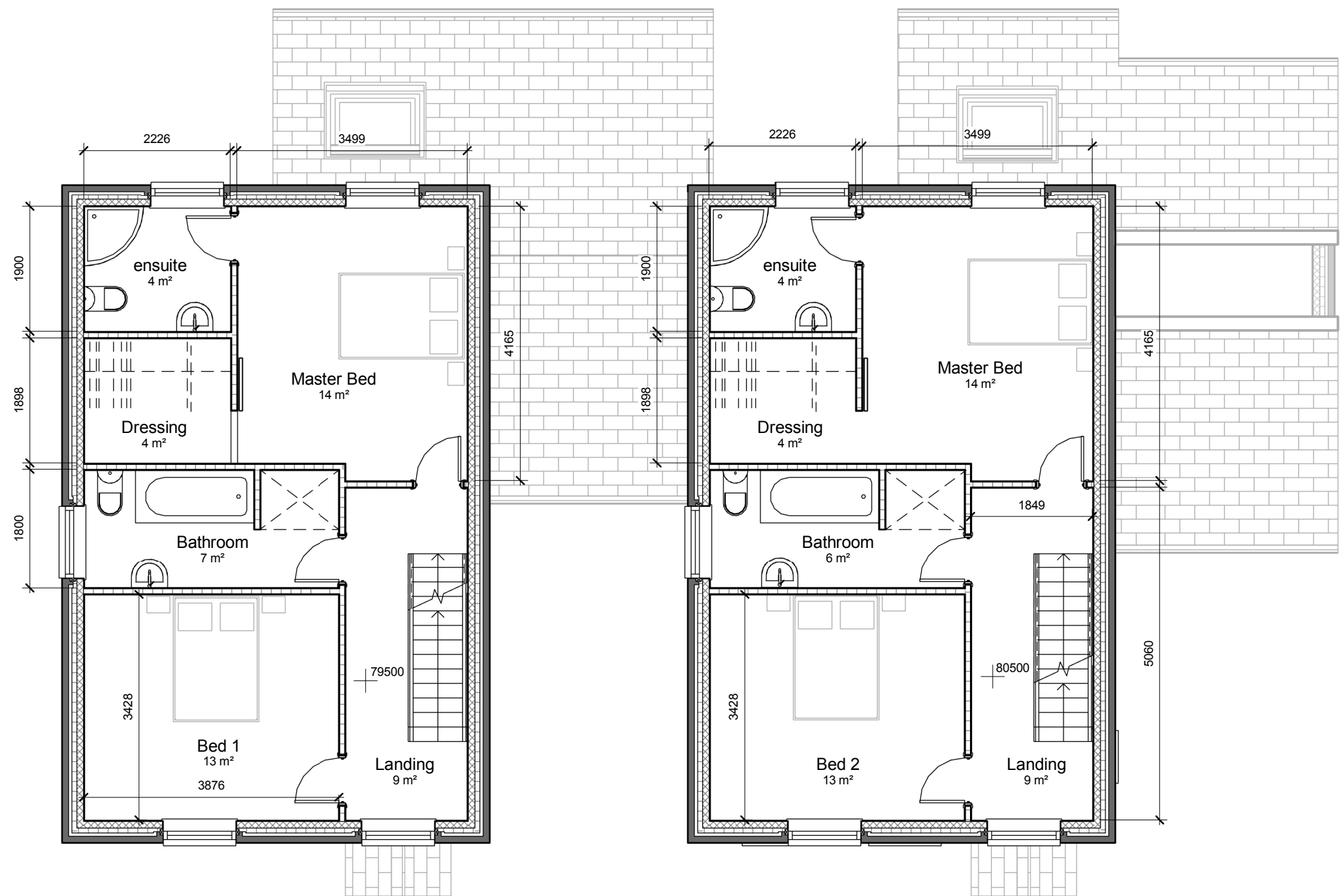
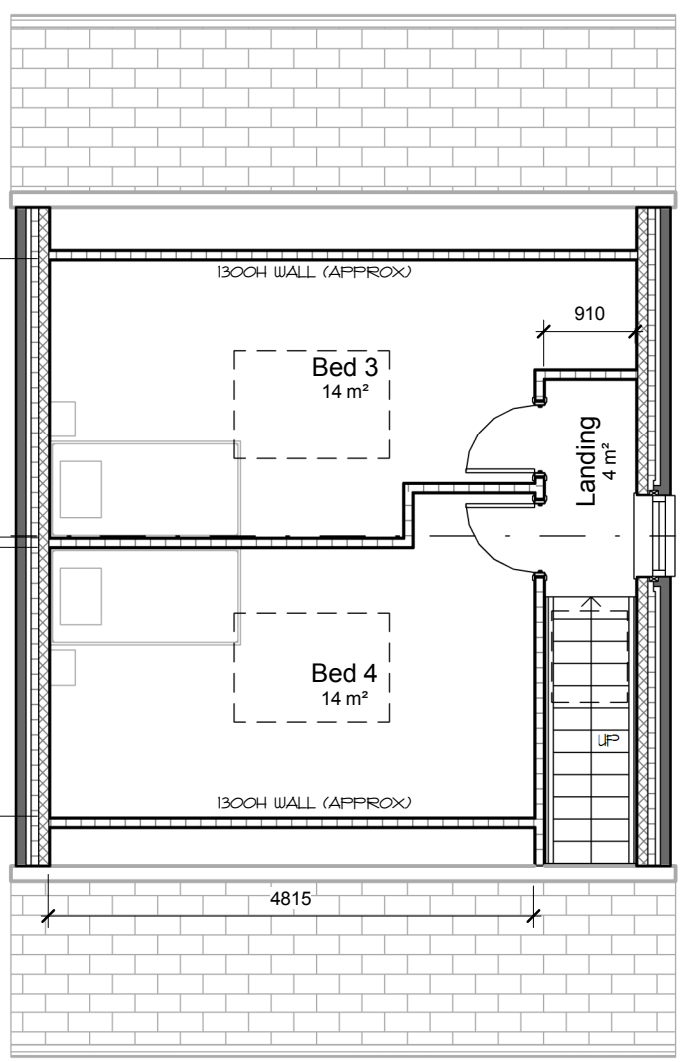


JUNCTION OF NAB LANE AND BANK STREET, MIRFIELD



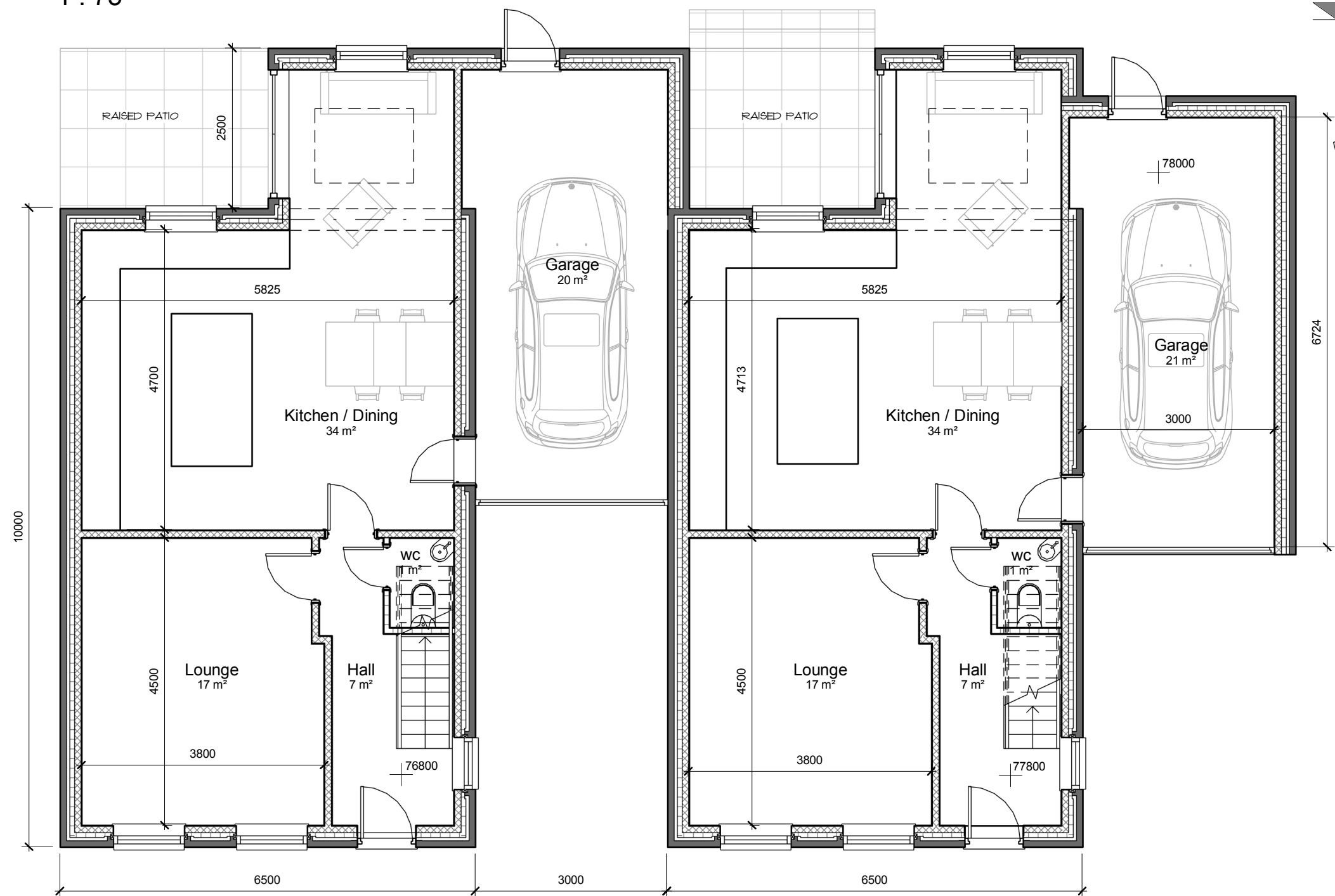
Second Floor

1 : 75



First Floor

1 : 75



Ground Floor

1 : 75



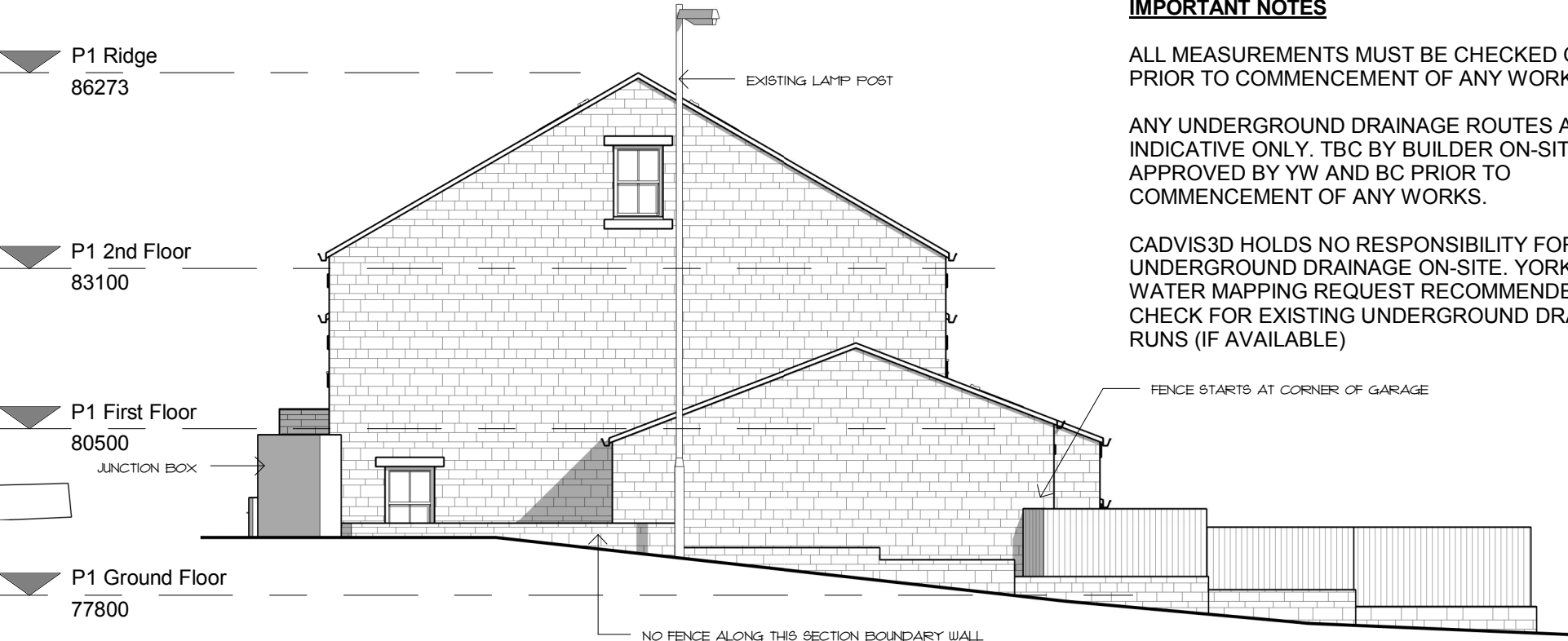
Front Elevation (SE Facing)

1 : 100



Rear Elevation (NW Facing)

1 : 100



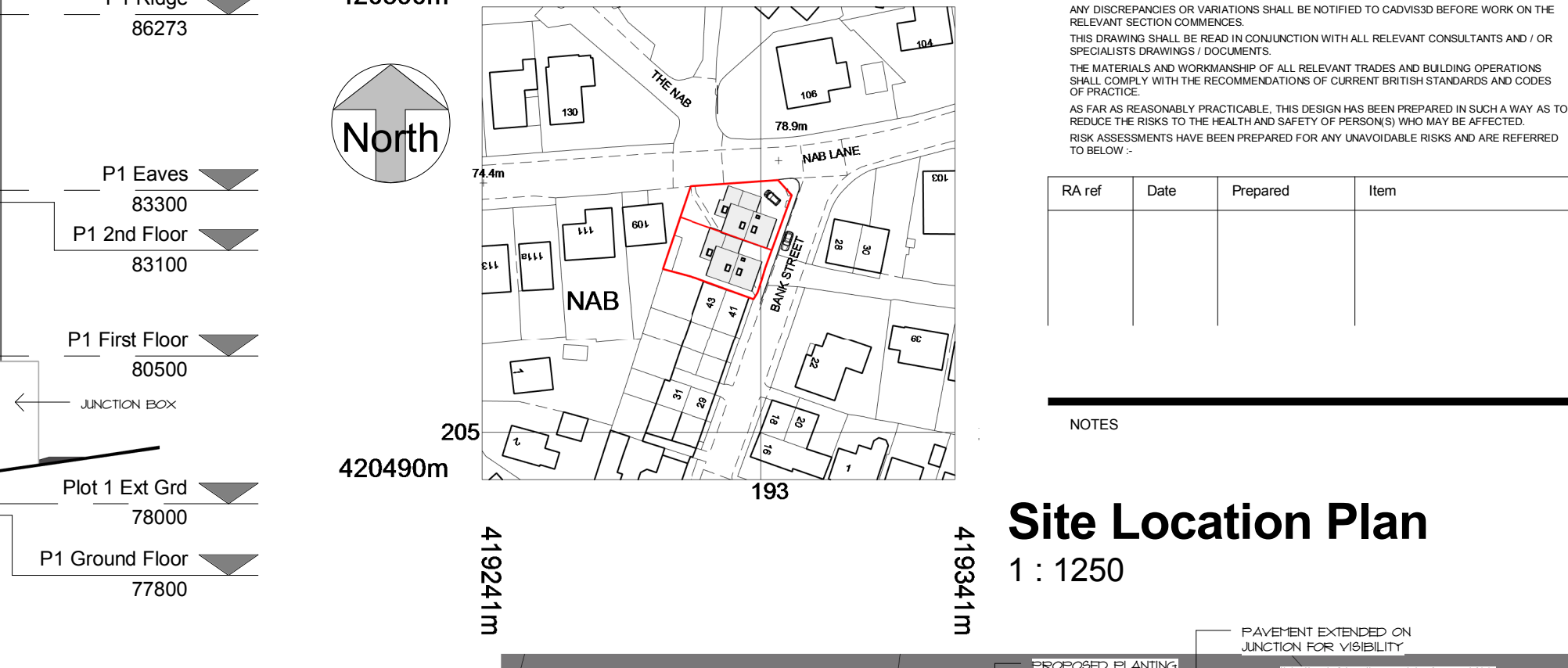
Side Elevation Plot 1 (NE Facing)

1 : 100



Side Elevation Plot 2 (SW Facing)

1 : 100



Site Location Plan

1 : 1250



Site Plan

1 : 200

OVERALL SITE AREA 446SQM / 0.044 Ha

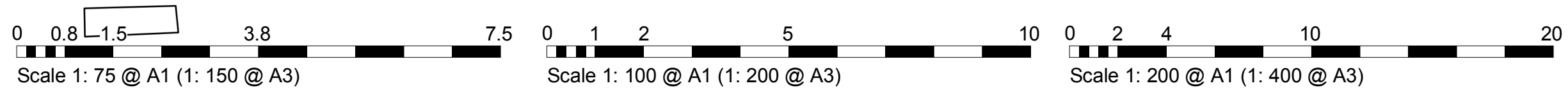


Side Elevation Plot 1 (SW Facing)

1 : 100



Front Perspective



GENERAL

DO NOT SCALE FROM THIS DRAWING.

ALL DIMENSIONS ARE TO BE CHECKED ON SITE AND CONFIRMED TO AUTHOR.

ALL FEASIBILITY STUDIES ARE SUBJECT TO FULL SITE SURVEY + LOCAL AUTHORITY APPROVALS.

ANY DISCREPANCIES OR VARIATIONS SHALL BE NOTIFIED TO CADVIS3D BEFORE WORK ON THE RELEVANT SECTION COMMENCES.

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT CONSULTANTS AND / OR SPECIALISTS DRAWINGS / DOCUMENTS.

THE MATERIALS AND WORKMANSHIP OF ALL RELEVANT TRADES AND BUILDING OPERATIONS SHALL COMPLY WITH THE RECOMMENDATIONS OF CURRENT BRITISH STANDARDS AND CODES OF PRACTICE.

AS FAR AS REASONABLY PRACTICABLE, THIS DESIGN HAS BEEN PREPARED IN SUCH A WAY AS TO REDUCE THE RISKS TO THE HEALTH AND SAFETY OF PERSONS WHO MAY BE AFFECTED.

RISK ASSESSMENTS HAVE BEEN PREPARED FOR ANY UNAVOIDABLE RISKS AND ARE REFERRED TO BELOW.

RA ref	Date	Prepared	Item

NOTES

A 08/01/19 PSI JP PLOT 1 BOUNDARY WALL & DRIVE EXTENDED FOLLOWING HIGHWAYS COMMENTS

rev	date	dr	app	notes
scale	As indicated	drawn	PSI	apprv JP
date	AUG 2019	path	Checked doc/Architectural Job/1536 - Plot 1 Mirfield Arch/Proposed 1536 - proposed PLANNING rev	
status	PLANNING			
job no	1936	dwg no	A/10/-01	rev A

Cadvis3d
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ARCHITECTURAL DESIGN SERVICES

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project
Residential New Build @ Land Located at
Junction with Bank Street & Nab Lane,
Mirfield, WF14 9QF

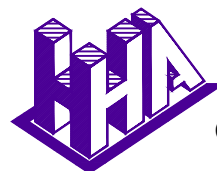
client
Peel Construction Limited

title
Plans & Elevations - As Proposed



Rev A TEST HOLE INFORMATION ADDED

16.07.21 CW



Haigh Huddleston & Associates

Civil Structural Engineering Consultants

Project	NAB LANE, MIRFIELD
Client	AW DEVELOPMENTS UK Ltd
Detail	DRILLING AND GROUTING GRID
Scale	Dwn Date Dwg No.
1:200@A3	CW May'21 E21/7790/200A

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APPENDIX B

Bore Hole Logs



DRILLING LOG SHEET

SITE: Nab lane

CREW INITIALS: JL RIG: C6

LEAD DRILLER INITIALS: GP LEAD DRILLER SIGNED:

DATE: 28-5-21 SHEET: 1 OF 2

EQUIPMENT USED:

BH	DEPTH	STRATA DESCRIPTION
A1	000 - 1.40	made ground
	1.40 - 4.60	Clay
	4.60 - 9.40	mudstone
	9.40 - 14.80	Sandstone
	14.80 - 15.40	Fractured Sandstone
	15.40 - 18.00	Sandstone
B1	000 - 1.70	made ground
	1.70 - 4.70	Clay
	4.70 - 9.80	mudstone
	9.80 - 18.00	Sandstone
C1	000 - 2.80	made ground
	2.80 - 4.60	Clay
	4.60 - 9.40	mudstone
	9.40 - 14.40	Sandstone
	14.40 - 15.20	Fractured Sandstone
	15.20 - 18.00	Sandstone
D1	000 - 2.80	made ground
	2.80 - 4.60	Clay
	4.60 - 9.60	mudstone
	9.60 - 12.30	Sandstone
	12.30 - 13.10	Fractured Sandstone
	13.10 - 18.00	Sandstone

BH	DEPTH	STRATA DESCRIPTION
E1	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 8.90	mudstone
	8.90 - 15.40	Sandstone
	15.40 -	Fractured Sandstone
	15.40 - 18.00	Sandstone
F1	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 8.90	mudstone
	8.90 - 18.00	Sandstone
G1	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 8.90	mudstone
	8.90 - 14.20	Sandstone
	14.20 - 15.20	Fractured Sandstone
	15.20 - 18.00	Sandstone
A2	000 - 1.40	made ground
	1.40 - 4.30	Clay
	4.30 - 9.70	mudstone
	9.70 - 13.60	Sandstone
	13.60 - 14.60	Fractured Sandstone
	14.60 - 18.00	Sandstone

BH	CASING DIA	CASING DEPTH

GAS READING	

TOTALS	BH's	DRILL	CASE	CORE
TODAY				
PREVIOUS				
TO DATE				

DL-MIR-1



SITE: Nab Lane

CREW INITIALS: JL	RIG: C6
-------------------	---------

DATE: 28-5-21	SHEET: 2 OF 2
---------------	---------------

EQUIPMENT USED:

LEAD DRILLER INITIALS	LEAD DRILLER SIGNED
GP	

[illegible][illegible][illegible]

GAS READING	

TOTALS	BH's	DRILL	CASE	CORE
TODAY	10	180		
PREVIOUS	—	—		
TO DATE	10	180		

DL-MIR-2



DRILLING LOG SHEET

SITE: Nab lane

CREW INITIALS: JLDJ RIG: C6

LEAD DRILLER INITIALS	LEAD DRILLER SIGNED
GP	

DATE: 1-6-21 SHEET: 1 OF 2

EQUIPMENT USED:

BH	DEPTH	STRATA DESCRIPTION
D2	000 - 2.80	made ground
	2.80 - 4.60	Clay
	4.60 - 9.50	mudstone
	9.50 - 18.00	Sandstone
E2	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 9.50	mudstone
	9.50 - 12.30	Sandstone
	12.30 - 13.40	Fractured Sandstone
	13.40 - 18.00	Sandstone
F2	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 9.60	mudstone
	9.60 - 18.00	Sandstone
G2	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 9.60	mudstone
	9.60 - 18.00	Sandstone
A3	000 - 1.50	made ground
	1.50 - 4.70	Clay
	4.70 - 10.00	mudstone
	10.00 - 12.80	Sandstone
	12.80 - 14.40	Fractured Sandstone

BH	DEPTH	STRATA DESCRIPTION
	14.40 - 18.00	Sandstone
B3	000 - 1.50	made ground
	1.50 - 4.60	Clay
	4.60 - 9.80	mudstone
	9.80 - 11.80	Sandstone
	11.80 - 13.30	Fractured Sandstone
	13.30 - 18.00	Sandstone
C3	000 - 2.70	made ground
	2.70 - 4.60	Clay
	4.60 - 9.60	mudstone
	9.60 - 18.00	Sandstone
D3	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 9.50	mudstone
	9.50 - 18.00	Sandstone
E3	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 9.60	mudstone
	9.60 - 18.00	Sandstone
F3	000 - 2.80	made ground
	2.80 - 4.80	Clay
	4.80 - 9.70	mudstone
	9.70 - 18.00	Sandstone

BH	CASING DIA	CASING DEPTH

GAS READING

TOTALS	BH's	DRILL	CASE	CORE
TODAY				
PREVIOUS				
TO DATE				

DL-MIR-3

DRILLING LOG SHEET

SITE: Nob lane

CREW INITIALS: JL DS	RIG: CC
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DATE: 1-6-21	SHEET: 2 OF 2
--------------	---------------

EQUIPMENT USED:

LEAD DRILLER INITIALS	LEAD DRILLER SIGNED
	

BH	DEPTH	STRATA DESCRIPTION
Q3	000 - 2.80	made ground
	2.80 - 4.80	Clay
	4.80 - 9.70	mudstone
	9.70 - 18.00	Sandstone
AL4	000 - 1.70	made ground
	1.70 - 4.80	Clay
	4.80 - 9.80	mudstone
	9.80 - 13.70	Sandstone
	13.90 - 16.00	Fractured Sandstone
	16.00 - 18.00	Sandstone
B4	000 - 1.80	made ground
	1.80 - 4.80	Clay
	4.80 - 9.70	mudstone
	9.70 - 18.00	Sandstone

[illegible][illegible]

GAS READING	

TOTALS	BH's	DRILL	CASE	CORE
TODAY	13	234		
PREVIOUS	10	180		
TO DATE	23	414		

DL-MIR-4



DRILLING LOG SHEET

SITE: Nab lane

CREW INITIALS: JL DS

RIG: C6

LEAD DRILLER INITIALS

GP

LEAD DRILLER SIGNED

DATE: 2-6-21

SHEET: 1 of 2

EQUIPMENT USED:

BH	DEPTH	STRATA DESCRIPTION
C4	000 - 2.70	made ground
	2.70 - 4.80	Clay
	4.80 - 9.80	mudstone
	9.80 - 18.00	Sandstone
D4	000 - 2.70	made ground
	2.70 - 4.80	Clay
	4.80 - 11.70	Sandstone
	11.70 - 13.80	Fractured Sandstone
	13.80 - 18.00	Sandstone
E4	000 - 2.80	made ground
	2.80 - 4.80	Clay
	4.80 - 9.70	mudstone
	9.70 - 12.00	Sandstone
	12.00 - 13.90	Fractured Sandstone
F4	13.90 - 18.00	Sandstone
	000 - 2.80	made ground
	2.80 - 4.80	Clay
	4.80 - 9.70	mudstone
G4	9.70 - 18.00	Sandstone
	000 - 2.80	made ground
	2.80 - 4.80	Clay
	4.80 - 9.70	mudstone
	9.70 - 18.00	Sandstone

BH	DEPTH	STRATA DESCRIPTION
A5	000 - 2.90	made ground
	2.90 - 4.60	Clay
	4.60 - 9.80	mudstone
	9.80 - 15.00	Sandstone
	15.00 - 16.90	Fractured Sandstone
	16.90 - 18.00	Sandstone
A7	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 9.80	mudstone
	9.80 - 14.80	Sandstone
	14.80 - 16.80	Fractured Sandstone
	16.80 - 18.00	Sandstone
A6	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 9.80	mudstone
	9.80 - 13.40	Sandstone
	13.40 - 16.10	Fractured Sandstone
	16.10 - 18.00	Sandstone

BH	CASING DIA	CASING DEPTH

GAS READING

TOTALS	BH's	DRILL	CASE	CORE
TODAY				
PREVIOUS				
TO DATE				

DL - MIR - S



CREW INITIALS: TL DS

RIG: C6

DATE: 2-6-2

SHEET: 2 OF 2

EQUIPMENT USED:

LEAD DRILLER INITIALS

LEAD DRILLER SIGNED

GP

[illegible]

GAS READING	

TOTALS	BH's	DRILL	CASE	CORE
TODAY	10	180		
PREVIOUS	23	414		
TO DATE	33	594		

DL-MIR-6



CREW INITIALS: JL DS	RIG: C6
----------------------	---------

LEAD DRILLER INITIALS	LEAD DRILLER SIGNED
GP	

DATE: 3-6-21	SHEET: 1 OF 1
--------------	---------------

EQUIPMENT USED:

BH	DEPTH	STRATA DESCRIPTION
	mobilise	grout
	equipment	to
	Nab lane	
	Change hammer on C6	
D5	000- 2.90	made ground
	2.90- 4.80	Clay
	4.80- 9.80	med stone
	9.80- 18.00	Sandstone
E5	000- 2.80	made ground
	2.80- 4.80	Clay
	4.80- 9.80	med stone
	9.80- 12.60	Sandstone
	12.60- 14.00	Fractured
		Sandstone
	14.00- 18.00	Sandstone

[illegible][illegible]

GAS READING

TOTALS	BH's	DRILL	CASE	CORE
TODAY	2	36		
PREVIOUS	33	594		
TO DATE	35	630		

DL-MIR-7



SITE: Nab Lane

CREW INITIALS: JL DS	RIG: C6
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DATE: 4-6-21	SHEET: 1 OF 1
--------------	---------------

EQUIPMENT USED:

LEAD DRILLER INITIALS	LEAD DRILLER SIGNED
SP	

[illegible][illegible]

BH	CASING DIA	CASING DEPTH

GAS READING	
_____ _____ _____ _____ _____	_____ _____ _____ _____ _____

TOTALS	BH's	DRILL	CASE	CORE
TODAY	2	36		
PREVIOUS				
TO DATE				

Add on to final totals

DL-MIR-8



DRILLING LOG SHEET

SITE: Nab Lane

CREW INITIALS: JL DS RIG: C6

DATE: 7-6-21 SHEET: 1 OF 1

EQUIPMENT USED:

LEAD DRILLER INITIALS CP	LEAD DRILLER SIGNED
-----------------------------	-------------------------

BH	DEPTH	STRATA DESCRIPTION
B6	000 - 2.70	made ground
	2.70 - 4.80	Clay
	4.80 - 9.90	mudstone
	9.90 - 12.10	Sandstone
	12.10 - 13.30	Fractured Sandstone
	13.30 - 18.00	Sandstone
B8	000 - 2.70	made ground
	2.70 - 4.80	Clay
	4.80 - 10.00	mudstone
	10.00 - 14.00	Sandstone
	14.00 - 15.40	Fractured Sandstone
	15.40 - 18.00	Sandstone
B7	000 - 2.70	made ground
	2.70 - 4.90	Clay
	4.90 - 9.90	mudstone
	9.90 - 12.30	Sandstone
	12.30 - 13.40	Fractured Sandstone
	13.40 - 18.00	Sandstone

BH	DEPTH	STRATA DESCRIPTION
C6	000 - 2.80	made ground
	2.80 - 4.80	Clay
	4.80 - 9.80	mudstone
	9.80 - 11.10	Sandstone
	11.10 - 15.80	Fractured Sandstone
	15.80 - 18.00	Sandstone

BH	CASING DIA	CASING DEPTH

GAS READING

TOTALS	BH's	DRILL	CASE	CORE
TODAY	4	72		
PREVIOUS	35	630		
TO DATE	39	702		

DL-MIR-9



SITE: Nab lane

CREW INITIALS: JLDS	RIG: C6
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DATE: 8-6-21	SHEET: 1 OF 1
--------------	---------------

EQUIPMENT USED:

LEAD DRILLER INITIALS	LEAD DRILLER SIGNED
GP	

BH	DEPTH	STRATA DESCRIPTION
D6	000 - 2.80	made ground
	2.80 - 4.80	Clay
	4.80 - 9.80	mudstone
	9.80 - 13.20	Sandstone
	13.20 - 15.00	Fractured Sandstone
	15.00 - 18.00	Sandstone
D8	000 - 2.70	made ground
	2.70 - 4.90	Clay
	4.90 - 9.90	mudstone
	9.90 - 18.00	Sandstone
D10	000 - 2.70	made ground
	2.70 - 4.40	Clay
	4.40 - 9.60	mudstone
	9.60 - 18.00	Sandstone
E6	000 - 2.80	made ground
	2.80 - 4.60	Clay
	4.60 - 9.50	mudstone
	9.50 - 18.00	Sandstone
E7	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 9.50	mudstone
	9.50 - 18.00	Sandstone

[illegible]

BH	CASING DIA	CASING DEPTH

[illegible]

TOTALS	BH's	DRILL	CASE	CORE
TODAY	7	126		
PREVIOUS	39	702		
TO DATE	46	828		

DL-MIR-10



DRILLING LOG SHEET

SITE: Nab Lene

CREW INITIALS: JL DS

RIG: C6

LEAD DRILLER INITIALS

LEAD DRILLER SIGNED

GP

DATE: 9-6-21

SHEET: 1 of 1

EQUIPMENT USED:

BH	DEPTH	STRATA DESCRIPTION
C8	000 - 2.70	made ground
	2.70 - 4.80	Clay
	4.80 - 9.80	mudstone
	9.80 - 12.50	Sandstone
	12.50 - 13.60	Fractured Sandstone
	13.60 - 18.00	Sandstone
C9	000 - 2.70	made ground
	2.70 - 4.80	Clay
	4.80 - 9.70	mudstone
	9.70 - 18.00	Sandstone
F9	000 - 2.70	made ground
	2.70 - 4.70	Clay
	4.70 - 9.70	mudstone
	9.70 - 15.80	Sandstone
	15.80 - 16.80	fractured
	16.80 - 18.00	Sandstone
G8	000 - 2.70	made ground
	2.70 - 4.80	Clay
	4.80 - 9.70	mudstone
	9.70 - 18.00	Sandstone
F8	000 - 2.70	made ground
	2.70 - 4.60	Clay
	4.60 - 9.70	mudstone
	9.70 - 18.00	Sandstone

BH	CASING DIA	CASING DEPTH

GAS READING

BH	DEPTH	STRATA DESCRIPTION
F7	000 - 2.80	made ground
	2.80 - 4.80	Clay
	4.80 - 9.60	mudstone
	9.60 - 18.00	Sandstone
G6	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 9.70	mudstone
	9.70 - 18.00	Sandstone
F6	000 - 2.80	made ground
	2.80 - 4.80	Clay
	4.80 - 9.70	mudstone
	9.70 - 18.00	Sandstone
	+ 2 Bh 4-6-21	
	+ 36 mt 4-6-21.	
F9		
G7	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 9.70	mudstone
	9.70 - 18.00	Sandstone

TOTALS	BH's	DRILL	CASE	CORE
TODAY	11	198		
PREVIOUS	46	828		
TO DATE	57	1026		

DL-MIR-11



CREW INITIALS: JL DS RIG: CB

DATE: 11-6-21 SHEET: 1 OF 1

EQUIPMENT USED:

LEAD DRILLER INITIALS

LEAD DRILLER SIGNED

98

[illegible][illegible]

GAS READING

TOTALS	BH's	DRILL	CASE	CORE
TODAY	4	72		
PREVIOUS				
TO DATE				

DL-MIR-12



CREW INITIALS: DS RIG: C6

DATE: 14-6-21 SHEET: 1 OF 1

EQUIPMENT USED:

LEAD DRILLER INITIALS GP	LEAD DRILLER SIGNED 
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BH	DEPTH	STRATA DESCRIPTION
Test 5	000 - 2.70	made ground
	2.70 - 4.80	Clay
	4.80 - 9.60	mod. stone
	9.60 - 11.50	Sandstone
	11.50 - 12.60	Grout trace
	12.60 - 18.00	Sandstone
Test 6	000 - 2.80	made ground
	2.80 - 4.70	Clay
	4.70 - 9.70	mod. stone
	9.70 - 18.00	Sandstone

[illegible]

BH	CASING DIA	CASING DEPTH
Test 6	89-9	4-5

[illegible]

TOTALS	BH's	DRILL	CASE	CORE
TODAY	2	36	4-5.	
PREVIOUS				
TO DATE				

DL-MIR-13

APPENDIX C

Grout Logs



GROUTING LOG SHEET

SITE: Nab LaneCREW INITIALS: JK DS

LEAD GROUTER INITIALS	LEAD GROUTER SIGNED
<u>GP</u>	<u>[Signature]</u>

DATE: 7-6-21 SHEET: 1 OF 3GROUTING METHOD USED: BAGGED GROUT / BULK GROUT

	CEMENT	BAG GROUT P.F.A	SAND	PEA GRAVEL	BH REF	FULL	NOT FULL	PSI	GROUT QUAN (T)	CEMENT	BAGGED P.F.A	SAND	PEA GRAVEL
DELIVERED TODAY	2.0	19.5			A1	✓			0.22	0.02	0.2		
DELIVERED PREVIOUS	—	—			B1	✓			0.11	0.01	0.1		
DELIVERED TOTAL	2.0	19.5			C1	✓			0.33	0.03	0.3		
TOTAL USED	0.8	8.0			D1	✓			0.33	0.03	0.3		
STOCK ON SITE	1.2	11.5			E1	✓			0.12	0.02	0.2		
DELIVERY TICKET DETAILS Cement 2.0 ton from yard stock P.F.A 19.5 N° 010597					F1	✓			0.11	0.01	0.1		
					G1	✓			0.33	0.03	0.3		
					A2	✓			0.33	0.03	0.3		
					B2	✓			0.11	0.01	0.1		
					C2	✓			0.11	0.01	0.1		
					D2	✓			0.11	0.01	0.1		
					E2	✓			0.44	0.04	0.4		
					F2	✓			0.11	0.01	0.1		
					G2	✓			0.11	0.01	0.1		
					A3	✓			0.33	0.03	0.3		
					B3	✓			0.33	0.03	0.3		
					C3	✓			0.11	0.01	0.1		

SLUMP TEST
NO / YES...
mm

BLEED TEST
NO / YES...
%

CUBE SAMPLES
NO / YES
QTY

TODAY TOTAL					
PREVIOUS TOTAL					
TO DATE TOTAL					

GT-MIR-1



GROUTING LOG SHEET

SITE: Nab Lane

CREW INITIALS: JL DS

LEAD GROUTER INITIALS	LEAD GROUTER SIGNED
GP	

DATE: 7-6-21 SHEET: 2 OF 3

GROUTING METHOD USED: ~~BAGGED GROUT~~ / BULK GROUT

	CEMENT	BAG GROUT PFA	SAND	PEA GRAVEL	BH REF	FULL	NOT FULL	PS.I	GROUT QUAN (T)	CEMENT	BAG GROUT PFA	SAND	PEA GRAVEL
DELIVERED TODAY					D3	✓			0-11	0-01	0-1		
DELIVERED PREVIOUS					E3	✓			0-11	0-01	0-1		
DELIVERED TOTAL					F3	✓			0-11	0-01	0-1		
TOTAL USED					G3	✓			0-11	0-01	0-1		
STOCK ON SITE					A4	✓			0-44	0-04	0-4		
DELIVERY TICKET DETAILS					B4	✓			0-11	0-01	0-1		
					C4	✓			0-11	0-01	0-1		
					D4	✓			0-33	0-03	0-3		
					E4	✓			0-44	0-04	0-4		
					F4	✓			0-11	0-01	0-1		
					G4	✓			0-11	0-01	0-1		
					A5	✓			0-33	0-03	0-3		
					A6	✓			0-55	0-05	0-5		
					A7	✓			0-55	0-05	0-5		
					B5	✓			0-55	0-05	0-5		
					C5	✓			0-11	0-01	0-1		
					D5	✓			0-11	0-01	0-1		

SLUMP TEST	BLEED TEST	CUBE SAMPLES
NO / YES...	NO / YES...	NO / YES
mm	%	QTY

TODAY TOTAL					
PREVIOUS TOTAL					
TO DATE TOTAL					

GT-MIR-2



GROUTING LOG SHEET

SITE: Nab LaneCREW INITIALS: IL DS

LEAD GROUTER INITIALS <u>SP</u>	LEAD GROUTER SIGNED 
------------------------------------	--

DATE: 7-6-21 SHEET: 3 OF 3GROUTING METHOD USED: ~~BAGGED~~ GROUT / BULK GROUT

	CEMENT	BAG GROUT		PEA GRAVEL	BH REF	FULL	NOT FULL	PSI	GROUT QUAN (T)	CEMENT	BAG GROUT		PEA GRAVEL
		PEA	SAND								PEA	SAND	
DELIVERED TODAY					ES	✓			0.55	0.05	0.5		
DELIVERED PREVIOUS					FS	✓			0.11	0.01	0.1		
DELIVERED TOTAL					GS	✓			0.11	0.01	0.1		
TOTAL USED													
STOCK ON SITE													
DELIVERY TICKET DETAILS													

SLUMP TEST
NO / YES...
mm

BLEED TEST
NO / YES...
%

CUBE SAMPLES
NO / YES
QTY

TODAY TOTAL	8.8	0.8	8.0		
PREVIOUS TOTAL	-	-	-		
TO DATE TOTAL	8.8	0.8	8.0		

GT-MIR-3

GT-MIR-4



CREW INTIALS: 3L DS

DATE: 9 | 6 | 21

SHEET: 1 OF 1

GROUTING METHOD USED: ~~BAGGED GROUT~~ / BULK GROUT

LEAD GROUTER INITIALS GP	LEAD GROUTER SIGNED
-----------------------------	---------------------

SLUMP TEST

NO / YES...

mm

BLEED TEST

NO / YES...

%

CUBE SAMPLES	
NO / YES	
	QTY

TODAY TOTAL	3.3	0.3	3.0		
PREVIOUS TOTAL	16.5	1.5	15.0		
TO DATE TOTAL	19.8	1.8	18.0		

GT-MIR-S



GROUTING LOG SHEET

SITE: Nab Lane

CREW INITIALS: JL DS

LEAD GROUTER INITIALS	LEAD GROUTER SIGNED
<u>GP</u>	

DATE: 11-6-21 SHEET: 1 OF 1

GROUTING METHOD USED: BAGGED GROUT / BULK GROUT

	CEMENT	BAG GROUT		SAND	PEA GRAVEL	BH REF	FULL	NOT FULL	P.S.I	GROUT QUAN (T)	CEMENT	BAG GROUT		SAND	PEA GRAVEL
		P.F.A										P.F.A			
DELIVERED TODAY						<u>Test 1</u>	<u>✓</u>			<u>0-22</u>	<u>0-02</u>	<u>0-2</u>			
DELIVERED PREVIOUS						<u>Test 2</u>	<u>✓</u>			<u>0-11</u>	<u>0-01</u>	<u>0-1</u>			
DELIVERED TOTAL						<u>Test 3</u>	<u>✓</u>			<u>0-11</u>	<u>0-01</u>	<u>0-1</u>			
TOTAL USED						<u>Test 4</u>	<u>✓</u>			<u>0-11</u>	<u>0-01</u>	<u>0-1</u>			
STOCK ON SITE															
DELIVERY TICKET DETAILS															

SUMP TEST
NO / YES...
mm

BLEED TEST
NO / YES...
%

CUBE SAMPLES
NO / YES
QTY

TODAY TOTAL	<u>0-55</u>	<u>0-05</u>	<u>0-5</u>		
PREVIOUS TOTAL					
TO DATE TOTAL					

GT-MIR-6



GROUTING LOG SHEET

SITE: Nab Lane

CREW INITIALS: DS

LEAD GROUTER INITIALS

LEAD GROUTER SIGNED

DATE: 14-6-21

SHEET: 1 OF 1

GROUTING METHOD USED:

BAGGED GROUT / BULK GROUT

	CEMENT	BAG GROUT P.F.A	SAND	PEA GRAVEL	BH REF	FULL	NOT FULL	PSI	GROUT QUAN (T)	CEMENT	BAG GROUT P.F.A	SAND	PEA GRAVEL
DELIVERED TODAY					Test 5	✓			0-11 001	0-1			
DELIVERED PREVIOUS					Test 6	✓			0-11 001	0-1			
DELIVERED TOTAL													
TOTAL USED													
STOCK ON SITE													
DELIVERY TICKET DETAILS													

SLUMP TEST

NO / YES...

mm

BLEED TEST

NO / YES...

%

CUBE SAMPLES

NO / YES

QTY

TODAY
TOTAL

0-22 0-02 0-2

PREVIOUS
TOTALTO DATE
TOTAL

GT-MIR-7

APPENDIX D

Grout Cube Test Results

Slump Bleed Test Results

CONCRETE TEST CUBE REPORT



Date: 25/06/2021

Report no: WAB51238857_01

Client: GROUND SUPPORT SERVICES (UK) LTD

Scheme: 1098G- UNIT B2B BRYANS CLOSE, HARWORTH
INDUSTRIAL

Contract no: 51059540

Request Sheet No.	Lab Ref.	Client Ref.	Date Made	Time Made	Date Received in Laboratory	Date Tested	Age days	Dimensions mm	Density kg/m ³	Failure Load kN	Compressive Strength N/mm ²	Specified Strength N/mm ²
4314305	51238857	E	07/06/2021		24/06/2021	25/06/2021	18	100x100x100	1410	27.5	2.8	not given
Location: NOT GIVEN												
Mix details: NOT GIVEN												
Remarks: Degree of saturation uncertain.												
4314305	51238858	F	07/06/2021		24/06/2021	25/06/2021	18	100x100x100	1380	25.2	2.5	not given
Location: NOT GIVEN												
Mix details: NOT GIVEN												
Remarks: Degree of saturation uncertain.												

The following apply unless otherwise stated under Remarks.

- 1) Laboratory curing range 18°-22°C.
- 2) Cube appearance as received satisfactory.
- 3) Test moisture condition and density saturated.
- 4) Cube failure normal. Concrete appearance normal.
- 5) Volume determined by measurement or designated size. Any fins removed by abrasive stone.
- 6) Laboratory curing conditions cannot be assured during tank cleaning.
- 7) Certificate of sampling not received. Certificate of making and curing not received.
- 8) Rate of Loading 0.4 to 0.8 N/mm² per sec.

Certified that curing of the hardened concrete in the laboratory and testing for shape, dimensions, density and compressive strength was carried out in accordance with BS EN 12390-1:2012, BS EN 12390-2:2019, BS EN 12390-7:2019 and BS 12390-3:2019
Air Content determined in accordance with BS EN 12350-7:2019

Signed

P. Thomas

Paul Thomas - Section Manager

for and on behalf of SOCOTEC UK Limited

Issued to: GROUND SUPPORT SERVICES (UK) LTD

CONCRETE TEST CUBE REPORT



Date: 25/06/2021

Report no: WAB51238859_01

Client: GROUND SUPPORT SERVICES (UK) LTD

Scheme: 1098G- UNIT B2B BRYANS CLOSE, HARWORTH
INDUSTRIAL

Contract no: 51059540

Request Sheet No.	Lab Ref.	Client Ref.	Date Made	Time Made	Date Received in Laboratory	Date Tested	Age days	Dimensions mm	Density kg/m ³	Failure Load kN	Compressive Strength N/mm ²	Specified Strength N/mm ²
4314306	51238859	G	08/06/2021		24/06/2021	25/06/2021	17	100x100x100	1410	29.2	2.9	not given
Location: NOT GIVEN Mix details: NOT GIVEN Remarks: Degree of saturation uncertain.												
4314306	51238860	H	08/06/2021		24/06/2021	25/06/2021	17	100x100x100	1440	24.4	2.4	not given
Location: NOT GIVEN Mix details: NOT GIVEN Remarks: Degree of saturation uncertain.												

The following apply unless otherwise stated under Remarks.

- 1) Laboratory curing range 18°-22°C.
- 2) Cube appearance as received satisfactory.
- 3) Test moisture condition and density saturated.
- 4) Cube failure normal. Concrete appearance normal.
- 5) Volume determined by measurement or designated size. Any fins removed by abrasive stone.
- 6) Laboratory curing conditions cannot be assured during tank cleaning.
- 7) Certificate of sampling not received. Certificate of making and curing not received.
- 8) Rate of Loading 0.4 to 0.8 N/mm² per sec.

Certified that curing of the hardened concrete in the laboratory and testing for shape, dimensions, density and compressive strength was carried out in accordance with BS EN 12390-1:2012, BS EN 12390-2:2019, BS EN 12390-7:2019 and BS 12390-3:2019
Air Content determined in accordance with BS EN 12350-7:2019

Signed

P. Thomas

Paul Thomas - Section Manager

for and on behalf of SOCOTEC UK Limited

Issued to: GROUND SUPPORT SERVICES (UK) LTD



Slump and Bleed data

Site – AW Developments

Client – AW Developments / Aqeel Waheed

Our Reference – 32456/32465

Overview

Slump and Bleed testing are additional measures of grout testing to ensure that the grout mixed is of a suitable viscosity and fluidity for the application at hand.

The specification provided by the engineer will dictate the tolerance the results are to fall within but the generally accepted tolerances are

Slump test – 300mm to 600mm

Bleed test – 3% to 5%

More recently we have seen some engineers stipulate that over a large enough sample size, due to the nature of the works, it is the average that is important. This has therefore been included in this data.

Week Commencing	Date	Sheet Reference	Grout Type	Slump	Bleed
07/06/2021	07/06/2021	GT-MIR-1-3	G10	400	4%
07/06/2021	08/06/2021	GT-MIR-4	G10	300	3.70%
07/06/2021	09/06/2021	GT-MIR-5	G10	500	5%
07/06/2021	11/06/2021	GT-MIR-6	G10	400	4%
14/06/2021	14/06/2021	GT-MIR-7	G10	350	4%
Average				390	4%

Any queries on this information please contact us at the above office number

Cubes have also been taken at intermittent intervals. These reports have been sent separately

Thomas Perks

Sales and Technical

Ground Support Services