IAN FARMER ASSOCIATES

Kronospan Limited

RFQ-132KV Kronospan

FACTUAL GROUND INVESTIGATION REPORT

Contract: 2231512

Date: September 2025

Ian Farmer Associates (1998) Limited. Registered in England and Wales, No. 3661447
Registered office: Spring Lodge, 172 Chester Road, Helsby, Frodsham, WA6 0AR

FACTUAL GROUND INVESTIGATION REPORT

Carried out at

RFQ-132KV Kronospan

Land off A5 Chirk Bypass
Chirk,
Wrexham,
LL14 5NS

Prepared for

Kronospan Limited
Maesgwyn Farm,
Wrexham,
LL14 5NT

Contract: 2231512

Date: September 2025

Document Control

Project: **RFQ-132KV Kronospan**
Project No.: **2231512**
Report title: **FACTUAL GROUND INVESTIGATION REPORT**
Revision: **01**
Document No.: **2231512-FGIR-01-010925**

Revision Log

Revision	Date	Comment
00	10/09/2025	First issue – draft report. Pending final geotechnical laboratory results for BH01 and BH02.
01	12/09/2025	Second issue – final report. All laboratory results included.

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CONTENTS

1.0 INTRODUCTION 3

2.0 SITE SETTING 4
2.1 Site Location 4
2.2 Site Description 4

3.0 SITE WORK 5

4.0 LABORATORY TESTS 7
4.1 Geotechnical Testing 7
4.2 Thermal Resistivity Testing 7

5.0 REFERENCES 8

APPENDIX 1 - DRAWINGS
Figure A1.1 - Site Location Plan
Figure A1.2 - Exploratory Hole Location Plan

APPENDIX 2 - SITE WORK
General Notes on Site Work
- SPT Hammer Calibration Certificates
- Cable Percussive Borehole Records
- Cable Percussive with Rotary Follow-on Borehole Records and Photographs
- Dynamic Sample Borehole Records
- Gas and Groundwater Monitoring Records
- Rising Head Test Records

APPENDIX 3 - GEOTECHNICAL TESTS
- Results of Geotechnical Tests – Soils
- Results of Geotechnical Tests – Rock

APPENDIX 4 - THERMAL RESITIVITY TESTS
- Results of Thermal Resistivity Tests – Soils and Rock

1.0 INTRODUCTION

1.1 On the instructions of Kronospan Limited (KL), with Electricity Distribution Engineering Services Ltd (EDES) acting as design engineers, and PBU Ltd (PBU) as the directional drilling contractors, a ground investigation was undertaken by Ian Farmer Associates (IFA).

1.2 It is understood that the site will be developed for the installation of a new 132kV underground cable that will connect a new substation at the Kronospan manufacturing plant in Chirk, to the nearby grid network. Boreholes were required to support the design of both the proposed cable route and the horizontal directional drilling (HDD). Thermal resistivity tests were required to determine soil thermal properties to ensure adequate cable performance.

1.3 The investigation was carried out in accordance with the EDES specification, reference EDES-1249-HDDSPEC-001 Rev-B, dated 03/04/2025

1.4 This report presents the factual data obtained from this ground investigation.

1.5 This report has been prepared for the sole use of the Client for the purpose described and no extended duty of care to any third party is implied or offered, except for where specific requirements for extended warranties have been agreed and confirmed in writing by Ian Farmer Associates (IFA). Any other third parties not named by IFA using any information contained within this report do so at their own risk.

1.6 The comments given in this report and the opinions expressed herein are based on the information received, the conditions encountered during site works, and on the results of tests made in the field and laboratory. However, there may be conditions prevailing at the site which have not been disclosed by the investigation, and which have not been considered in the report.

1.7 The comments on groundwater conditions are based on observations made at the time the site work was carried out. It should be noted that groundwater levels vary owing to seasonal or other effects.

2.0 SITE SETTING

2.1 Site Location

2.1.1 The site is situated on the Welsh borders, extending approximately 2.5 km eastwards from the town of Chirk, near Wrexham.

2.1.2 The linear site spans both the eastern and western sides of the Chirk bypass A5 and can be split into three distinct areas. These areas of site may be located by British National Grid references:

- Western area: SJ 299381 (BH01)
- Central area: SJ 300381 (BH02 and BH03)
- Eastern area: SJ 312389 (BH04)

2.1.3 A site location plan is included in Appendix 1, Figures A1.1 and A1.2.

2.2 Site Description

2.2.1 The site was linear, extending from BH01 in the west to BH04 in the east. The combined site area was approximately 4.00 hectares (Ha).

2.2.2 The western area (BH01) covered the northern tip of an area of agricultural land. This area was bound by Colliery Road to the west and north, by pastureland to the south and by an area of immature woodland to the east, running parallel to the Chirk Bypass A5. The site was relatively flat with an elevation of 119 m above Ordnance Datum (AOD).

2.2.3 The central area (BH02 and BH03) was located at the northern end of a neighbouring agricultural field. This area was bound to the west by an area of woodland running parallel to the A5, pastureland to the south and east, and an unnamed road to the north, lined with small areas of woodland. The area around BH02 had an elevation of 113 m AOD and sloped gently eastwards toward BH03 where the elevation was 99 m AOD.

2.2.4 The eastern area (BH04) was located in the northeast corner of an agricultural field. This area was boarded by an area of woodland named Bola's Dingle to the north, an unnamed road to the southeast and pastureland to the west and south. The area was relatively uneven, sloping moderately down to the north-east. The land surrounding BH03 had an elevation of 51m AOD

3.0 SITE WORK

3.1 The site work was carried out between the 15th and 25th July 2025 based on the practices set out in British Standards BS 10175, BS 5930, and BS EN 1997-2.

3.2 The positions of the exploratory holes were proposed by the client, and amended, where required, subject to site constraints.

3.3 Exploratory locations were carried out as follows:

Exploratory Hole Type	Quantity	Hole Reference	Depths (m BGL)	Notes
Cable Percussive Borehole	1	BH01	0.00 to 25.35	None.
Cable Percussive with Rotary Follow-on Borehole	1	BH02	0.00 to 20.50	Rotary by coring.
Dynamic Sampling Boreholes	2	BH03 BH04	0.00 to 10.40 0.00 to 10.45	Difficulties progressing through granular material. BH03 - change to rotary coring method between 6.00m to 10.40m. BH04 – change to rotary coring method between 6.50 and 8.00m.

3.4 The positions of the exploratory holes are shown on the exploratory hole location plan, Appendix 1, Figure A1.3.

3.5 The depths of the exploratory holes, depths and type of samples and in-situ tests, descriptions of strata encountered and comments on groundwater conditions are given in the site work records in Appendix 2.

3.6 Standard penetration tests (SPT) were carried out in accordance with BS EN ISO 22476–3, in the boreholes in the various strata to determine SPT N value. The uncorrected values of penetration resistance, N value, are given on the borehole records. SPT hammer calibration certificates are included within Appendix 2.

3.7 Photographs of core recovery from the rotary core borehole (BH02) are given in Appendix 2.

3.8 Samples were taken in accordance with BS EN ISO 22475-1, at the depths shown on the exploratory hole records and transported to the local IFA office for temporary retention. Samples for testing were forwarded to the IFA in-house geotechnical testing laboratory and to Soil Environment Services laboratory for thermal resistivity testing.

3.9 Samples for environmental purposes were collected in appropriate containers, placed in a cool box, and dispatched to a UKAS accredited laboratory for testing. No environmental was scheduled by the client.

3.10 Monitoring standpipes were installed as follows:

Standpipe Type	Quantity	Hole Reference	Response zone (m BGL)	Notes
Slotted Standpipe Installations 50mm	4	BH01 BH02 BH03 BH04	19.00 to 25.00 12.00 to 20.00 3.00 to 7.50 3.00 to 6.50	Installed in strata to monitor groundwater and gas levels. Gas valve and raised cover fitted.

3.11 Details of monitoring standpipes are presented on the records in Appendix 2.

3.12 In-situ tests and other works were undertaken as follows:

In-situ test / other work	Quantity	Hole Reference	Depths (m BGL)	Notes
Rising Head Permeability	3	BH02 BH03 BH04	14.86 to 17.25 3.50 to 7.50 3.03 to 7.00	BH02 unable to calculate permeability as 75% recharge not met.

3.13 Records of in-situ tests and other work are presented in Appendix 2.

3.14 The co-ordinates and ground levels at the exploratory hole locations were surveyed based on British National Grid and Ordnance Datum. These values are reported on the exploratory hole records in Appendix 2.

3.15 Monitoring of standpipes for groundwater and gas levels was undertaken on two occasions approximately four weeks after the completion of each borehole. The gas levels monitored were oxygen, carbon dioxide, methane, carbon monoxide and hydrogen sulphide. The flow rate of each borehole was also monitored. Concentrations of total volatile organic compounds (VOCs) were recorded using a photo ionisation detector (PID). The monitoring results are given in Appendix 2.

4.0 LABORATORY TESTS

4.1 Geotechnical Testing

4.1.1 Schedules for geotechnical testing were prepared by directional drilling contractors PBU.

4.1.2 Soil samples were prepared in accordance with relevant test standards and representative sub-samples were taken for testing. The following tests were carried out:

- 13 No. Moisture content
- 13 No. Liquid limit / plastic limit
- 12 No. Particle size distribution (PSD) by wet sieving
- 11 No. Sedimentation by pipette
- 1 No. Point load (both axial and diametral)

4.1.3 The results of the testing are given in Appendix 3 as follows:

- Geotechnical soil testing: Test Reports 223152 and 2231512A.
- Geotechnical rock testing: Test Report 2231512.

4.2 Thermal Resistivity Testing

4.2.1 The suite of thermal resistivity tests was scheduled by IFA and agreed by PBU.

4.2.2 Thermal resistivity tests were carried out on disturbed samples taken at approximately 2-meter intervals from each borehole. For depth ranges where material recovery was limited, a thermal resistivity test was performed on material from the nearest meter interval. The following tests were carried out:

- 29 No. T8 Thermal resistivity tests, 3kg sample (natural soils)

4.2.3 The thermal resistivity testing was carried out using the Standard Test Method for Determination of Thermal Conductivity of Soil and Soft Rock by Thermal Needle Probe Procedure and in accordance with ASTM Designation D5334-14, 2015. Results are shown in Appendix 4, Test Reports BH01, BH02, BH03 and BH04.

5.0 REFERENCES

American Society for Testing and Materials (ATSM), D5334-14, Standard Test Method for Determination of Thermal Conductivity of Soil and Soft Rock by Thermal Needle Probe Procedure, 2015.

British Standards Institute, BS 5930: 2015+A1:2020: *Code of Practice for Ground Investigations*, 2015

British Standards Institute, BS 10175: 2011+A2:2017: *Investigation of Potentially Contaminated Sites. Code of Practice*, 2011

British Standards Institute, BS EN 1997, Part 2:2007: *Eurocode 7 – Geotechnical Design. Part 2: Ground Investigation and Design*, 2007

British Standards Institute, BS EN ISO 14688 Part 1:2018 and Part 2:2018: *Geotechnical Investigation and Testing – Identification and Classification of Soil*, 2018

British Standards Institute, BS EN ISO 14689-1:2018: *Geotechnical Investigation and Testing – Identification and Classification of Rock. Part 1: Identification and Description*, 2018

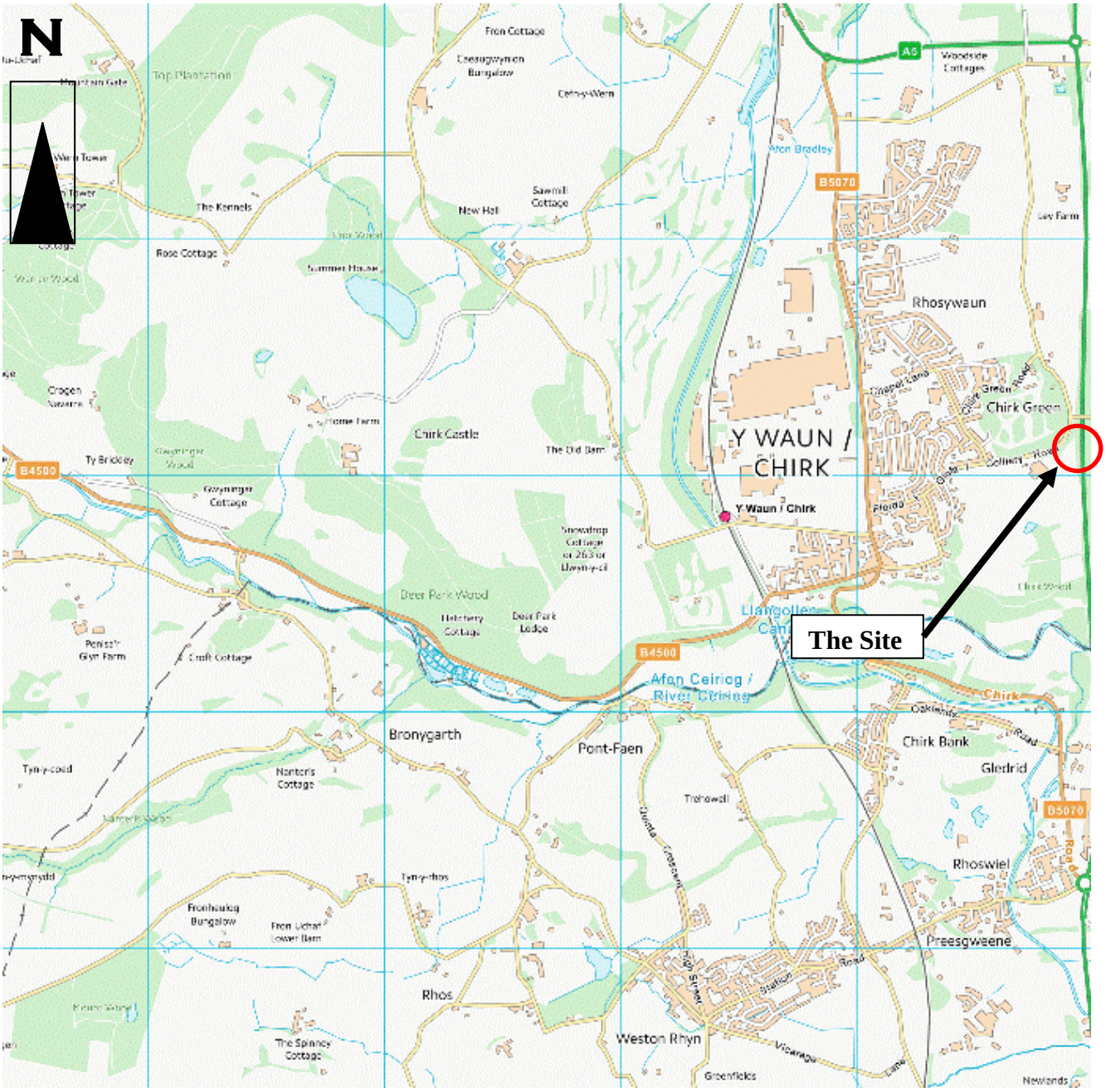
British Standards Institute, BS EN ISO 22475-1:2006: *Geotechnical Investigation and Testing – Sampling Methods and Groundwater Measurements*. *Part 1: Technical Principles for Execution*', 2006

British Standards Institute, BS EN ISO 22476–3:2005+A1:2011: *Geotechnical Investigation and Testing – Field Testing. Part 3: Standard Penetration Test*, 2005

Environment Agency, MCERTS *Performance Standard for Laboratories Undertaking Chemical Testing of Soil*, 2014 (updated 2023)

APPENDIX 1

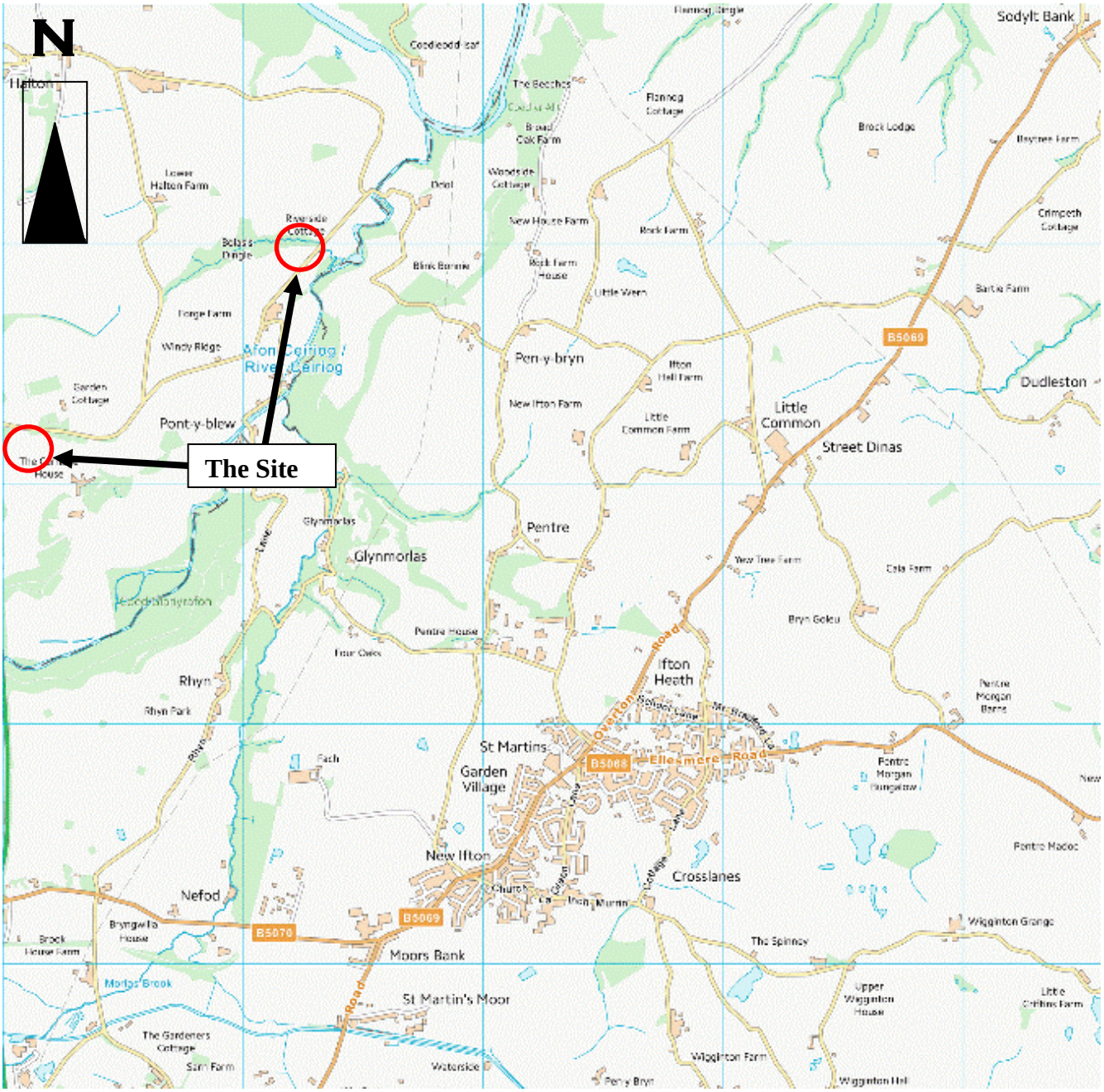
DRAWINGS



PROJECT: 2231512 RFQ-132KV Kronospan	
FIGURE No. A1.1	SCALE: Not to scale
TITLE: Site Location Plan	

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PROJECT: 2231512 RFQ-132KV Kronospan	
FIGURE No. A1.2	**SCALE: Not to scale**
TITLE: Site Location Plan	

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Legend Key

- Cable Percussive Borehole
- Cable Percussive with Rotary Follow-on Borehole
- Dynamic Sample Borehole
- Dynamic Sample with Rotary Follow-on Borehole

Project:

RFQ - 132KV Kronospan

Client:

Kronospan Limited

Title:

Exploratory Hole Location Plan

Project ID:	Scale (at A3):
2231512	1:4750
Figure Number:	Revision:
Fig. A1.2	(00)

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APPENDIX 2

SITE WORK

APPENDIX 2

Key to Abbreviations on Records

Sample abbreviations

B	Bulk disturbed sample
C	Core sample
D	Small disturbed sample
ES	Environmental soil sample

Note: Sample ID comprises sample type + sample number eg. D12

Test abbreviations

SPT(S)	Standard Penetration Test – split spoon

Core logging abbreviations

TCR	ratio of total core (solid and non intact) to length of core run (%)
SCR	ratio of solid core (at least one full diameter) to length of core run (%)
RQD	ratio of summed length of solid core longer than 100mm to length of core run (%)
FI	fracture index - number of fractures per metre over zone of uniform character
NR	Not recovered
NI	Non intact. Core not suitable for determination of fracture spacing
NA	Not applicable
AZCL	Assumed zone of core loss

Note: Assessment of SCR, RQD, FI and If excludes artificial fractures

Groundwater Symbols

▽	Groundwater strike
▼	Groundwater level after standing period

Logging of Soil and Rock

Soil and rock logging has been carried out based on the procedures in BS EN 14688, BS EN 14689 and BS 5930.

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING (UK) LTD
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP

SPT Hammer Ref:	AR2371
Test Date:	06/01/2025
Report Date:	06/01/2025
File Name:	AR2371.spt
Test Operator:	TW

Instrumented Rod Data

Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.4
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	72572
Accelerometer No.2:	72572

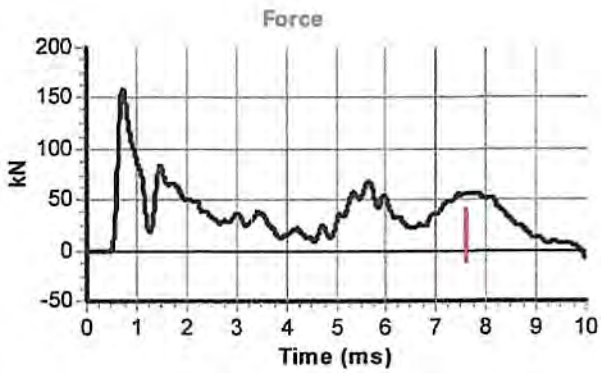
SPT Hammer Information

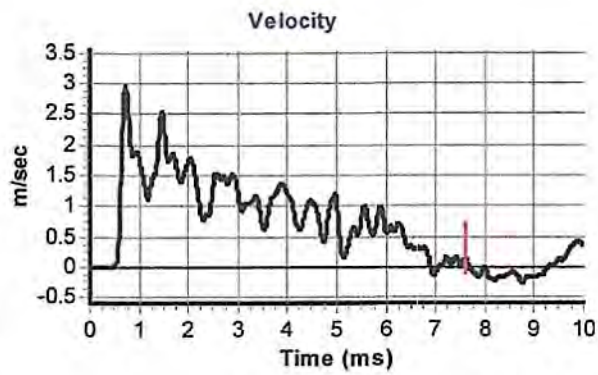
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	10.0

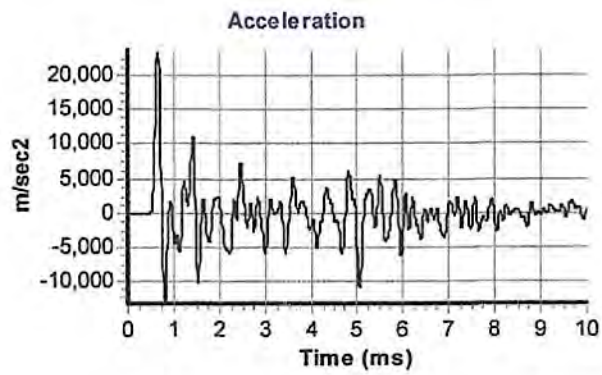
Comments / Location

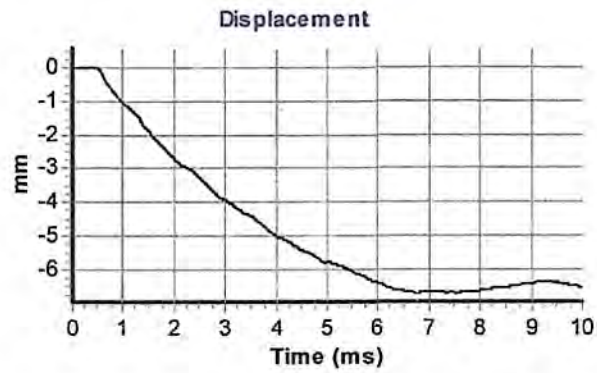
LUNDY SITE INVESTIGATIONS LIMITED

92321









Calculations

Area of Rod A (mm2):	957
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	367

Energy Ratio E_r (%): **78**

Signed: T WILKINSON

Title: FITTER

The recommended calibration interval is 12 months

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SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Dynamic Sampling Uk Ltd
Unit 8 Victory Park
Victory Road
Derby
DE248ZF

SPT Hammer Ref:	RM01
Test Date:	12/03/2025
Report Date:	12/03/2025
File Name:	RM01.spt
Test Operator:	B.HUNTER

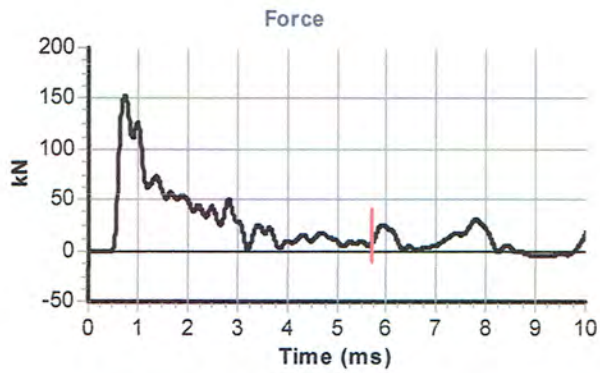
Instrumented Rod Data

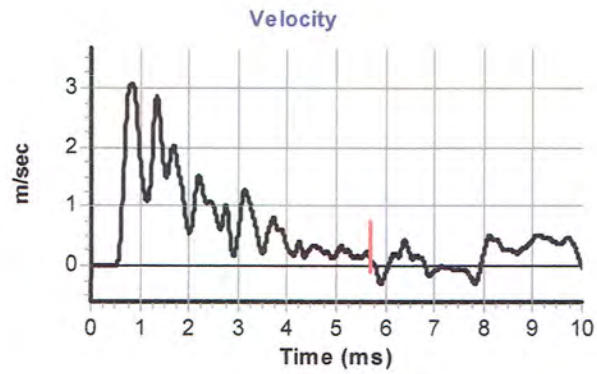
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.8
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	62901
Accelerometer No.2:	69902

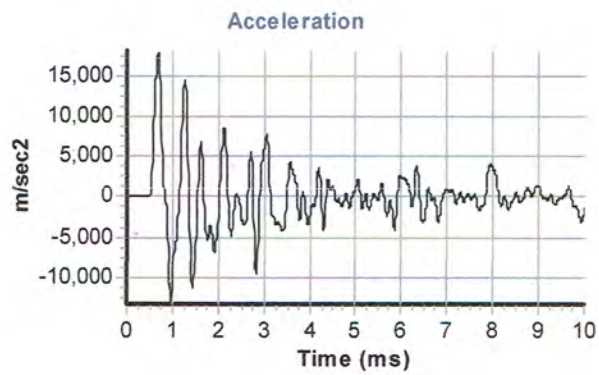
SPT Hammer Information

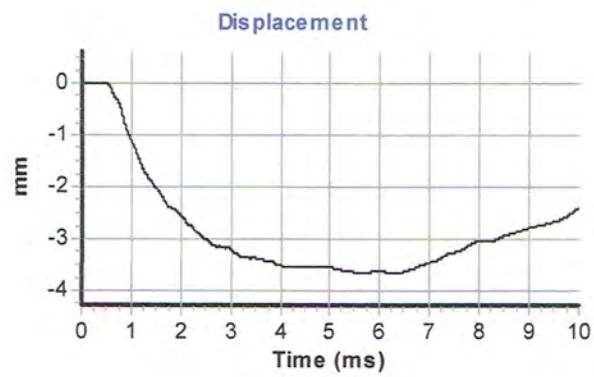
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	10.0

Comments / Location









Calculations

Area of Rod A (mm2):	1008
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	300

Energy Ratio E_r (%): **64**

Signed: B Hunter

Title: Operations Manager

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Plant used: Dando 2000	Project: RFQ - 132KV Kronospan		Location ID: **BH01**
Dates: 15/07/2025 - 16/07/2025	Client: Kronospan Limited		Sheet 1 of 3
Cable Percussion Borehole Log	Location: 329910.96E 338151.42N	Ground level: 119.36mOD / Logged by: AC / Vertical scale: 1:50	Project ID: 2231512

Depth	Sample ID	Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/ Installation
0.00 - 0.25	B1			(0.35)	MADE GROUND: Grass over light brown, slightly gravelly, slightly clayey, fine to coarse SAND. Gravel is subangular to rounded, fine to coarse including mudstone, sandstone, quartz and brick.			
0.25	ES2		119.02	0.35	(IMPORTED TOPSOIL)			
0.50	ES3			(0.35)	MADE GROUND: Stiff, yellowish brown mottled orangish brown, slightly sandy, gravelly CLAY. Gravel is subangular to rounded, fine to coarse including sandstone and mudstone.			
0.50 - 1.00	B4		118.66	0.70	(REWORKED TOPSOIL)			
1.00	ES5			(0.60)	Firm, brown mottled grey, orangish brown and black, slightly gravelly, sandy CLAY. Gravel is subangular to rounded, fine to coarse including mudstone, sandstone and quartz.			
1.20		SPT(S) N=12 (2,2/2,3,3,4)	118.06	1.30	Stiff becoming very stiff, dark greyish brown, slightly gravelly, slightly sandy, silty CLAY with low to medium cobble content. Gravel is angular to subrounded, fine to coarse including mudstone, siltstone and sandstone. Cobbles are subrounded including mudstone and siltstone.			
1.20 - 1.65	D6				*Between 2.00m and 2.45m: gravel bands.*			
1.20 - 1.70	B7							
1.50	ES8							
1.80	D9							
2.00		SPT(S) N=45 (4,15/15,15,7,8)						
2.00 - 2.30	B10							
2.00 - 2.45	D11							
2.00 - 2.50	B12							
2.80	D13							
3.00		SPT(S) N=25 (2,3/4,6,7,8)						
3.00 - 3.45	D14							
3.00 - 3.50	B15							
3.80	D16							
4.00		SPT(S) N=20 (4,4/4,5,5,6)						
4.00 - 4.30	B17							
4.00 - 4.45	D18							
4.00 - 4.50	B19							
4.80	D20							
5.00		SPT(S) N=27 (2,3/4,7,7,9)			*Below 5.00m: occasional pockets of yellowish brown SAND.*			
5.00 - 5.45	D21							
5.00 - 5.50	B22							
5.80	D23			(9.20)				
6.00		SPT(S) N=27 (3,4/5,6,6,10)						
6.00 - 6.30	B24							
6.00 - 6.45	D25							
6.00 - 6.50	B26							
7.00	D27							
7.50		SPT(S) N=31 (3,4/4,8,9,10)						
7.50 - 7.95	D28							
7.50 - 8.00	B29							
8.00 - 8.30	B30							
8.50	D31							
9.00		SPT(S) 50 (25 for 0mm/50 for 0mm)			*At 9.00m: boulder of mudstone.*			
9.00 - 9.50	B32							
10.00	D33				Continued next sheet			

Chiselling

From (m)	To (m)	Time (mins)	Remarks
15.30	15.80	60	

Borehole Diameter

Depth (m)	Dia (mm)
15.00	200
25.00	150

Boring Progress

Date	Time	Depth (m)	Cased (m)	Water (m)
15/07	16:30	12.00	12.00	Dry
16/07	08:00	12.00	12.00	Dry
16/07	16:30	25.00	19.00	24.40

Remarks:
Service inspection pit hand excavated from GL to 1.20m.

SPT Hammer: AR2371 Energy Ratio: 78%

Casing Diameter

Depth (m)	Dia (mm)
15.00	200
19.00	150

Water Strikes

Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
24.30	19.00		20	23.80	

Monitoring Installations

Top (m)	Base (m)	Pipe Type	Dia (mm)
0.00	19.00	Plain	50
19.00	25.00	Slotted	50

Checked by:	KH	IFA CP v01.01
Log status:	FINAL	

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Plant used:	Project:	Location ID:
Dando 2000	RFQ - 132KV Kronospan	**BH01**
Dates:	**Client:**	Sheet 2 of 3
15/07/2025 - 16/07/2025	Kronospan Limited	

Cable Percussion Borehole Log	Location:	Ground level:	Logged by:	Vertical scale:	Project ID:
	329910.96E 338151.42N	119.36mOD	AC	1:50	2231512

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/ Installation
10.00 - 10.30	B34				Stiff becoming very stiff, dark greyish brown, slightly gravelly, slightly sandy, silty CLAY with low to medium cobble content. Gravel is angular to subrounded, fine to coarse including mudstone, siltstone and sandstone. Cobbles are subrounded including mudstone and siltstone.			
10.50		SPT(S) N=29 (2,4/5,7,8,9)	108.86	10.50				
10.50 - 10.95	D35				Stiff to very stiff, brown, slightly gravelly, slightly sandy, silty CLAY with low cobble content. Gravel is subangular to rounded, fine to coarse including sandstone, mudstone and coal. Cobbles are subrounded including siltstone.			
10.50 - 11.00	B36							
11.50	D37							
12.00		SPT(S) N=29 (3,5/6,7,7,9)						
12.00 - 12.30	B38							
12.00 - 12.45	D39							
12.00 - 12.50	B40							
13.00	D41							
13.50		SPT(S) N=34 (2,4/8,8,8,10)						
13.50 - 13.95	D42							
13.50 - 14.00	B43							
14.00 - 14.30	B44							
14.50	D45							
15.00		SPT(S) 50 (25 for 0mm/50 for 0mm)						
15.00 - 15.50	B46			(9.50)				
15.60	B43							
16.00		SPT(S) N=37 (4,5/9,9,7,12)						
16.00 - 16.30	B47							
16.00 - 16.45	D48							
16.00 - 16.50	B49							
17.00	D50							
17.50		SPT(S) N=49 (10,11/12,12,12,13)						
17.50 - 18.00	B51							
18.00 - 18.30	B52							
18.50	D53							
19.00		SPT(S) 50 (3,8/50 for 245mm)						
19.00 - 19.45	D54							
19.00 - 19.50	B55							
20.00	D56		99.36	20.00	Continued next sheet			

Chiselling				Borehole Diameter		Boring Progress					Remarks:
From (m)	To (m)	Time (mins)	Remarks	Depth (m)	Dia (mm)	Date	Time	Depth (m)	Cased (m)	Water (m)	
											SPT Hammer: AR2371 Energy Ratio: 78%

Casing Diameter		Water Strikes						Monitoring Installations			
Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	Top (m)	Base (m)	Pipe Type	Dia (mm)

Checked by:	KH	IFA CP v01.01
Log status:	FINAL	

IAN FARMER ASSOCIATES

Plant used: Dando 2000	Project: RFQ - 132KV Kronospan		Location ID: **BH01**
Dates: 15/07/2025 - 16/07/2025	Client: Kronospan Limited		Sheet 3 of 3
Cable Percussion Borehole Log	Location: 329910.96E 338151.42N	Ground level: 119.36mOD / Logged by: AC / Vertical scale: 1:50	Project ID: 2231512

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/ Installation
20.00 - 20.30	B57				Very stiff, brownish grey, slightly sandy, gravelly CLAY with low cobble content. Gravel is subangular to subrounded, fine to coarse including mudstone, siltstone and sandstone. Cobbles are subrounded including mudstone and siltstone.			
20.50		SPT(S) N=33 (4,5/6,8,9,10)						
20.50 - 20.95	D58							
20.50 - 21.00	B59							
21.50	D60							
22.00		SPT(S) N=48 (6,8/10,10,12,16)		(4.30)				
22.00 - 22.30	B61							
22.00 - 22.45	D62							
22.00 - 22.50	B63							
23.00	D64							
23.50		SPT(S) N=38 (4,4/8,9,10,11)						
23.50 - 23.95	D65							
23.50 - 24.00	B66							
24.00 - 24.30	B67		95.06	24.30				
24.50	D68				Dense, greyish brown, silty, fine and medium SAND.			
25.00		SPT(S) 41 (4,10/41 for 200mm)		(1.05)				
25.00 - 25.35	D69		94.02	25.35	End of Borehole at 25.35m			

21 22 23 24 25 26 27 28 29 30

Chiselling				Borehole Diameter		Boring Progress					Remarks:
From (m)	To (m)	Time (mins)	Remarks	Depth (m)	Dia (mm)	Date	Time	Depth (m)	Cased (m)	Water (m)	SPT Hammer: AR2371 Energy Ratio: 78%

Casing Diameter		Water Strikes						Monitoring Installations			
Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	Top (m)	Base (m)	Pipe Type	Dia (mm)

Checked by:	KH	IFA CP v01.01
Log status:	FINAL	

IAN FARMER ASSOCIATES

Plant used: Dando 2000/Comacchio 205	Project: RFQ - 132KV Kronospan		Location ID: **BH02**
Dates: 17/07/2025 - 22/07/2025	Client: Kronospan Limited		Sheet 1 of 3
Cable Percussion and Rotary Boring Log	Location: 330008.48E 338141.42N	Ground level: 113.07mOD / Logged by: AC/NC / Vertical scale: 1:50	Project ID: 2231512

Depth	Sample ID	Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/ Installation
0.00 - 0.30	B1			(0.30)	MADE GROUND: Grass over, brown, gravelly, clayey, fine to coarse SAND. Gravel is subangular to rounded, fine to coarse including brick, mudstone, siltstone, sandstone and quartz. (IMPORTED TOPSOIL)			
0.00 - 0.30	D2							
0.25	ES3		112.77	0.30				
0.30 - 1.00	B4				Very stiff, light brown mottled grey, slightly gravelly, sandy CLAY. Gravel is subangular to rounded, fine to coarse including mudstone and sandstone.			
0.30 - 1.00	D5			(0.80)				
0.50	ES6							
1.00	ES7					1		
1.20		SPT(S) N=23 (4,5/7,7,4,5)	111.97	1.10				
1.20 - 1.65	D8				Firm to stiff, brown mottled orangish brown, slightly gravelly, slightly sandy, silty CLAY. Gravel is subangular to rounded, fine to coarse including sandstone, mudstone and coal.			
1.20 - 1.70	B9							
1.50	ES10							
1.80	D11							
2.00		SPT(S) N=17 (3,3/4,4,4,5)				2		
2.00 - 2.30	B12							
2.00 - 2.45	D13							
2.00 - 2.50	B14							
2.80	D15							
3.00		SPT(S) N=15 (2,4/4,4,3,4)				3		
3.00 - 3.45	D16							
3.00 - 3.50	B17							
3.80	D18			(5.50)				
4.00		SPT(S) N=13 (3,2/3,3,3,4)				4		
4.00 - 4.30	B19							
4.00 - 4.45	D20							
4.00 - 4.50	B21							
4.80	D22							
5.00		SPT(S) N=11 (1,2/2,2,3,4)				5		
5.00 - 5.45	D23							
5.00 - 5.50	B24							
5.80	D25							
6.00		SPT(S) N=17 (2,3/4,4,4,5)				6		
6.00 - 6.30	B26							
6.00 - 6.45	D27							
6.00 - 6.50	B28							
			106.47	6.60	Medium dense, brown, slightly gravelly, silty, fine to coarse SAND. Gravel is subrounded to rounded, fine and medium including mudstone and sandstone.			
7.00	D29					7		
7.50		SPT(S) N=20 (4,4/4,5,5,6)						
7.50 - 7.95	D30							
7.50 - 8.00	B31							
8.00 - 8.30	B32					8		
				(3.30)				
8.50	D33							
9.00		SPT(S) N=6 (1,2/1,2,1,2)			*Below 9.00m: loose, reddish brown.*	9		
9.00 - 9.45	D34							
9.00 - 9.50	B35							
			103.17	9.90		10		

Continued next sheet

Chiselling

From (m)	To (m)	Time (mins)	Remarks
11.50	12.00	60	

Borehole Diameter

Depth (m)	Dia (mm)
6.00	200
12.00	150
20.50	121

Boring Progress

Date	Time	Depth (m)	Cased (m)	Water (m)
17/07	16:30	6.00	6.00	Dry
18/07	08:00	6.00	6.00	Dry
18/07	16:30	12.00	12.00	Dry
21/07	08:00	12.00	12.00	7.80

Remarks:
Service inspection pit hand excavated from GL to 1.20m.

SPT Hammer: AR2371 Energy Ratio: 78%

Casing Diameter

Depth (m)	Dia (mm)
6.00	200
12.00	150
20.50	121

Water Strikes

Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Monitoring Installations

Top (m)	Base (m)	Pipe Type	Dia (mm)
0.00	12.00	Plain	50
12.00	20.00	Slotted	50

Checked by:	KH	IFA CP v01.01
Log status:	FINAL	

IAN FARMER ASSOCIATES	Plant used: Dando 2000/Comacchio 205	Project: RFQ - 132KV Kronospan	Location ID: **BH02**
	Dates: 17/07/2025 - 22/07/2025	Client: Kronospan Limited	Sheet 2 of 3
Cable Percussion and Rotary Boring Log	Location: 330008.48E 338141.42N	Ground level: 113.07mOD / Logged by: AC/NC / Vertical scale: 1:50	Project ID: 2231512

Samples & In Situ Testing				Strata Details				Groundwater	
Depth	Sample ID	Test Result		Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/ Installation
10.00 - 10.45	D36				(0.60)	Yellowish brown clayey, angular to subangular, fine to coarse GRAVEL including mudstone.			
10.50		SPT(S) 50 (4,4/50 for 245mm)		102.57	10.50	Possibly weathered MUDSTONE recovered as very stiff, grey, gravelly clay. Gravel is angular to subangular, fine to coarse including extremely weak mudstone.			
10.50 - 10.95	D37								
10.50 - 11.00	B38								
11.50	D39				(1.50)				
12.00 - 13.50	76 0 0	NA	12.00m - SPT(S) 50 (10,11/50 for 95mm) 12.00m - D40 12.50m - B41	101.07	12.00	Stiff locally very stiff, fissured, light grey mottled reddish brown SILT with up to 30%, subangular lithorelicts (up to 20mm) of extremely weak siltstone. Fissures are 0-90 degrees, very closely spaced, planar, smooth. (Residual SILTSTONE)			
		AZCL							
13.50 - 15.00	100 5 0	NA			(4.00)	*Between 13.50m and 13.80m: drilling disturbed, recovered as very soft, reddish brown and grey silty CLAY.*			
		0				*Between 14.55m and 14.63m: moderately weak, light grey, sandy SILTSTONE.*			
		NA							
15.00 - 16.50	87 0 0	AZCL	15.20m - B42						
		NA	15.60m - B43			*Between 15.60m and 15.80m: recovered as silty CLAY.*			
		NA		97.07	16.00	Stiff, fissured, grey and dark grey SILT with up to 20%, subangular lithorelicts (up to 40mm) of very weak siltstone. Fissures are 20-40 degrees, very closely spaced, planar, smooth. (Residual SILTSTONE)			
16.50 - 18.00	100 3 0	0				*Between 16.90m and 16.95m: very weak, grey, silty, medium and coarse grained SANDSTONE.*			
		NA	17.20m - B44		(2.45)				
18.00 - 19.50	95 6 0	0				*Between 18.09m and 18.12m: grey, medium and coarse grained SAND.*			
		~~NA~~		94.62	18.45	*Between 18.35m and 18.40: medium strong, dark grey SILTSTONE.*			
		NA	18.85m - B45		(0.75)	Stiff, fissured, thinly laminated (20-30 degree) dark grey and grey CLAY with up to 15%, subangular lithorelicts (up to 20mm) of extremely weak mudstone. Fissures are 40-60 degrees, very closely spaced, planar, polished, smooth. (Residual MUDSTONE)			
		15	19.37m - C46	93.87	19.20	Very weak, thickly laminated (0-5 degrees) lustrous COAL. Discontinuities are 1) 0-5 degrees, very closely spaced, planar, smooth, clean; and 2) 85-90 degrees, very closely spaced, planar, polished, clean.			
		AZCL		93.64	19.43				
					(0.57)	Assumed zone of core loss.			
	TCR/SCR/RQD	FI	Samples & Tests	93.07	20.00	Continued next sheet			

Chiselling				Borehole Diameter	
From (m)	To (m)	Time (mins)	Remarks	Depth (m)	Dia (mm)

Boring Progress				
Date	Time	Depth (m)	Cased (m)	Water (m)
21/07	14:30	20.50	20.50	4.20
21/07	16:00	18.00	18.00	1.10
22/07	08:00	18.00	18.00	3.20
22/07	14:30	18.00	20.50	4.20

Remarks:

SPT Hammer: AR2371 Energy Ratio: 78%

Casing Diameter	
Depth (m)	Dia (mm)

Water Strikes					
Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Monitoring Installations			
Top (m)	Base (m)	Pipe Type	Dia (mm)

Checked by:	KH	IFA CP v01.01
Log status:	FINAL	

IAN FARMER ASSOCIATES

Plant used: Dando 2000/Comacchio 205	Project: RFQ - 132KV Kronospan		Location ID: **BH02**
Dates: 17/07/2025 - 22/07/2025	Client: Kronospan Limited		Sheet 3 of 3
Rotary Boring Log	Location: 330008.48E 338141.42N	Ground level: 113.07mOD / Logged by: AC/NC / Vertical scale: 1:50	Project ID: 2231512

Coring, Samples & In Situ Testing				Strata Details					Groundwater	
Depth	TCR/SCR/ RQD	FI	Samples & Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend		Water Strike	Backfill/ Installation
19.50 - 20.50	50 0 0	NA		92.57	(0.50) 20.50	Firm, fissured, light and dark grey mottled reddish brown CLAY with up to 20%, subangular lithorelicts (up to 10mm) of weak grey mudstone and occasional subrounded, grey phosphatic nodules (up to 40mm). Fissures are 0-90 degrees, very closely spaced, planar, smooth, clean. (Residual MUDSTONE) End of Borehole at 20.50m		21 22 23 24 25 26 27 28 29 30		

Flush Details				Borehole Diameter		Boring Progress				
Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date	Time	Depth (m)	Cased (m)	Water (m)

Remarks:

SPT Hammer: AR2371 Energy Ratio: 78%

Casing Diameter		Water Strikes						Monitoring Installations			
Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	Top (m)	Base (m)	Pipe Type	Dia (mm)

Checked by:	KH	IFA RC v01.01
Log status:	FINAL	

Core Photographs
BH02

