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BY EMAIL

Our Ref: ORH/25/JRjcl5

21st February 2025

Dear Ian

195 Leeds Road, Heckmondwike
Intrusive Coal Mining Investigation

Further to our previous intrusive coal mining investigation letter report, dated 17th January 2025, further rotary boreholes have now been completed, in order to provide more information on the mining situation on the site. The latest borehole findings are detailed below, in the form of an update to the letter of the 17th, so that both phases of investigation are reported together.

Background

A Coal Mining Risk Assessment was undertaken by ARP Geotechnical Ltd (reference ORH/25/JRjcl1), dated 7th November 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 8th and 9th January 2025, and 14th and 17th February 2025. The findings of the investigations are reported below.

Published Geology

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. A significant fault is conjectured to cross the western section of the site, trending northwest – southeast, between 10m and 35m inside the southwestern boundary. The 1:10,000 paper map shows the fault to have downthrown the strata on the northeastern side of the fault by 45m. A narrow strip, along the southwestern margin of the site, sits within a different fault block from the rest of the site. The strata on this area are stated (by the fault throw mentioned earlier in this letter) to be around 45m higher in the succession than the rest of the site. The overall site, therefore, sits on two fault blocks.

Eastern Fault Block (Containing the Majority of the site)

The Flockton Thick Coal Seam is conjectured to outcrop within the eastern fault block, with the outcrop crossing approximately east-west on the northern quarter of the site. From the assessment of geological maps, the Flockton Thick Coal will only underlie the area of the site north of its conjectured outcrop.

The generalised vertical section on the geological map indicates the next seam below the Flockton Thick Coal is the Flockton Thin Coal, approximately 5m to 15m below the site, and up to 1.4m thick. The First Brown Metals Coal (up to 0.7m thick) is indicated to underlie the site at a depth of between 26m and 36m, with a thickness of up to 0.7m.

In view of the above, it was concluded that there was a potential for unrecorded shallow workings, within the Flockton Thick Coal seam and Flockton Thin Coal Seam, to pose a risk to ground stability under the proposed development located in the Eastern fault block. In the light of this, it was recommended that a rotary drilling investigation be carried out to check for any evidence of shallow workings.

Western Fault Block (Containing the western margin of the site)

No coal is conjectured to outcrop on site within the western fault block. The strata on this area are stated (by the fault throw mentioned earlier in this letter) to be around 45m higher in the succession than the rest of the site. However, based on the strata indicated to be present west of the fault, this cannot be correct and, therefore, the seams underlying the western fault block, and their likely depths, are uncertain. In the light of this uncertainty, rotary boreholes were recommended to be drilled on this area to determine any risk from shallow coal mining. Details of the investigation subsequently carried out are provided below.

Site Works

Fifteen boreholes were drilled, using rotary openhole water flush techniques, by Demolition and Geotechnical Ltd. Eight were drilled on 8th and 9th January 2025 (numbered RH1 to RH8) and seven were drilled on 14th and 17th February 2025 (numbered RH101 to RH107). The boreholes were taken to depths of between 4.8m and 32m, at the locations shown on the attached plan. 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 logs are attached.

Ground Conditions and Stability Assessment

A summary table showing the rotary borehole investigation details and assessment of cover thickness is attached. Interpretative cross sections are attached, with the most likely seams encountered annotated on the sections. As can be seen from the table and the sections, three seams were encountered on the main fault block during the investigation, as interpreted below.

1. Flockton Thick

   This seam was encountered in the north of the site only (RH2, RH105, RH106 and RH107). This confirms the geological map, which shows the seam outcrop to cross west to east on the north of the site, with the area south of the outcrop (south of the above boreholes) being free of the seam. In all four boreholes, the seam was unworked. The seam was between 1.0m and 1.6m thick, with the top of the seam at a depth of between 1m and 2m.

2. Flockton Thin

   This seam was encountered in most boreholes taken to a sufficient depth to reach it (with the exception of RH2, in which it was absent at the expected depth (assumed to have been missed). The

seam ranged in thickness between 1.0m and 1.5m and was present from depths of between 11.5m and 15.3m (to proven or estimated seam roof). The depth to rockhead varies on the site, but an average of 2.15m has been used (from the trial pits and window sample boreholes) to assess rock cover thickness. This shows the rock cover is either absent or marginal in the vast majority of locations, indicating a general requirement for drilling and grouting for proposed development across the site. The single exception is RH1, which is indicated to have sufficient cover, as a result of specific conditions in this borehole. As the conditions in RH1 cannot be relied upon to be laterally extensive, it would be prudent to assume that grouting should also extend to the area of RH1, possibly on a wider grid initially and the spacing closed up if cover thickness is confirmed to be inadequate.

3. First Brown Metals

This seam was encountered as workings at depth, within only RH3 and RH101. The depth to the base of the seam was 27.5m and 27.0m respectively. Geological maps indicate to the seam to be up to 0.7m thick. There is 13.8m and 12.8m rock cover between the seam and the overlying Flockton Thin coal seam. As a result, the seam is not considered to present any significant risk of instability for the site.

On the southwestern corner of the site, which sits on a different fault block with uncertain geology, a worked seam was encountered, with its base at 8.0m. The workings were 1.0m thick, and the sequence beneath the locality contains seams which could be up to 1.4m thick. With only between 4.45m and 4.85m rock cover to the seam in either case, the cover is insufficient and the workings in this seam will need drilling and grouting where they may affect proposed development. It is possible (although considered unlikely) that deeper seams may affect the surface in this corner of the site, and this would need to be checked during grouting works, if development is proposed in this area.

Conclusion

In the light of the above, coal mine workings identified across the site generally do not have sufficient rock cover, and stabilisation treatment by injection of grout into a grid of boreholes (known as drilling and grouting) will be required. A general 3m grid is recommended, continuing 3m beyond proposed building footprints, roads and attenuation tank. In the area at/around RH1, an initial 9m grid is recommended, closing to 3m where cover is found not to be sufficient.

In the north of the site (RH2, RH105, RH106 and RH107) another seam of shallow coal is present with the potential to have been worked by open excavation, although there was no evidence of this during the investigations and it is considered unlikely. However, any indication of outcrop workings in this area that are found during site clearance/development works should be inspected by the Engineer and may require deepening of foundations. Arisings of coal will need to be either disposed off-site or placed below at least 1m of low permeability cover (such as compacted clay), to prevent future combustion. The seam left in situ will also need to be considered for combustion risk, if there is less than 1m of low permeability cover already present.

The drilling and grouting works will need to be designed and carried out generally in accordance with CIRIA 32 "Construction Over Abandoned Mine Workings". The works will need to be monitored by a Geotechnical Engineer, and a Validation Report on the works issued following completion, to interested Stakeholders.

Once the workings have been treated, foundations will need to be appropriately reinforced. For a strip foundation, this would comprise two layers of B503 mesh within a 300mm thick footing - one near the bottom of the footing and one near the top. However, given the extensive faulting on site, it is recommended that all plots on the site are provided with such reinforced foundations.

Regulatory agreement will be required for any proposed ground stabilisation programme and engineering designs which interact with mining features.

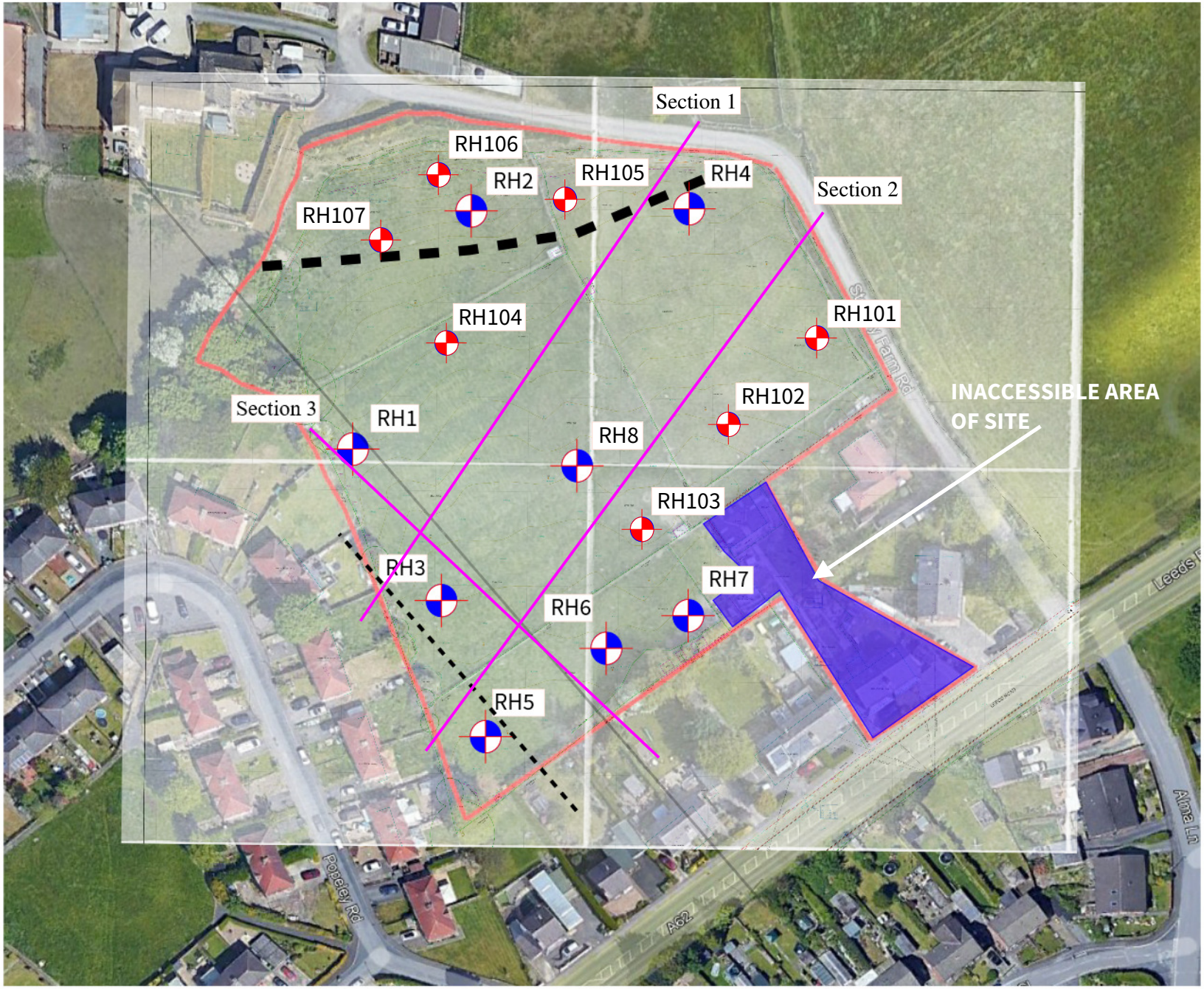
The findings of this letter are based on interpretation of complex strata geometry between existing borehole positions carried out, and this may need to be revised as further information becomes available from drilling and grouting works.

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 sincerely
for ARP GEOTECHNICAL LTD

J Race

Encs



0m 20m

Approximate Scale

RH1 ROTARY BOREHOLE JANUARY 2025

RH101 ROTARY BOREHOLE FEBRUARY 2025

CONJECTURED FAULT

CONJECTURED COAL SEAM OUTCROP

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS
Northwest House 5-6 Northwest Business Park Servia Hill Leeds LS6 2QH

Project	LAND AT 195 LEEDS ROAD HECKMONDWIKE
Client	ORION HOMES LTD
Title	ROTARY BOREHOLE LOCATION PLAN
Date	FEBRUARY 2025
Drawn	WW
Scale	AS SHOWN
Job No.	ORH/25

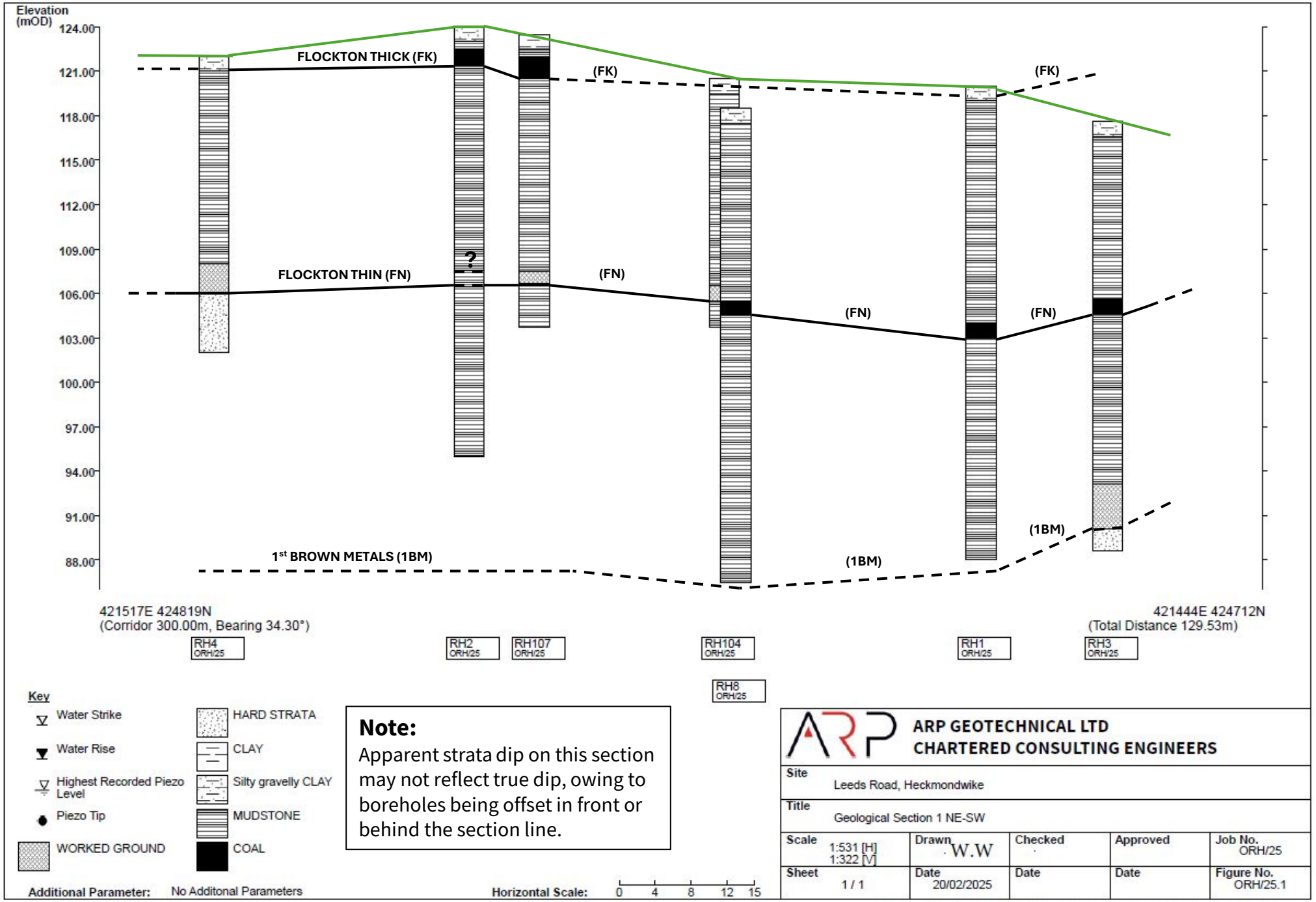
ORH/25 **COMBINED DETAILS OF ROTARY DRILLING CARRIED OUT IN JANUARY AND FEBRUARY 2025**

Flockton Thin is 1.5m thickness unless proved otherwise in a BH, and using average 2.15m depth to rock head (average from 16No. Trial pits and window sample BHs)

Borehole	ARP Ave Depth to Rock (m)	Depth (m) to base of 1st seam or wkgs	Probable Seam Identifed	Seam Thickness in this borehole (if coal found) (m)	Thickest solid seam found on site unless proved otherwise in this BH	Depth to original 1st seam roof (m)	Rock cover to original 1st seam roof (m)	Rock Cover Needed (m)	Cover to 1st seam adequate? (Y/N)	Depth (m) to base of 2nd seam or wkgs	Probable Seam Identifed	Seam Thickness in This BH (if coal found) (m)	Thickness from nearest borehole with solid coal, if solid seam not found in this BH	Depth to original 2nd seam roof (m)	Rock cover to original 2nd seam roof (m)	Rock Cover Needed (m)	Cover to 2nd seam adequate? (Y/N)
RH1	2.15	17.0 C	Flockton Thin	1.0	N/A	16.0	13.85	10.0	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RH2	2.15	2.6 C	Flockton Thick	1.0	N/A	1.6	0.00	10.0	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RH3	2.15	13.0 C	Flockton Thin	1.0	N/A	12.0	9.85	10.0	NO	27.5 W	1st Brown Metal	N/A	0.7	26.8	13.8	7.0	Yes
RH4	2.15	16.0 W	Flockton Thin	N/A	1.5	14.5	12.35	15.0	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RH5	2.15	8.0 W	Not Known	N/A	1.4 *	6.6	4.45	14.0 *	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RH6	2.15	14.0 W	Flockton Thin	N/A	1.5	12.5	10.35	15.0	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RH7	2.15	13.5 W	Flockton Thin	N/A	1.5	12.0	9.85	15.0	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RH8	2.15	14.0 C	Flockton Thin	1.0	N/A	13.0	10.85	10.0	Marginal #	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RH101	2.15	13.5 C	Flockton Thin	1.5	N/A	12.0	9.85	15.0	NO	27.0 W	1st Brown Metal	N/A	0.7	26.3	12.8	7.0	Yes
RH102	2.15	13.0 W	Flockton Thin	N/A	1.5	11.5	9.35	15.0	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RH103	2.15	13.8 W	Flockton Thin	N/A	1.5	12.3	10.15	15.0	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RH104	2.15	15.0 W	Flockton Thin	N/A	1.5	13.5	11.35	15.0	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RH105	2.15	2.0 C	Flockton Thick	1.0	N/A	1.0	0.00	10.0	NO (note at/nr surface	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RH106	2.15	3.6 C	Flockton Thick	1.6	N/A	2.0	0.00	16.0	NO (note at/nr surface	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RH107	2.15	3.0 C	Flockton Thick	1.5	N/A	1.5	0.00	15.0	NO (note at/nr surface	16.8 W	Flockton Thin	N/A	1.5	15.3	12.3	15.0	NO

Rock head is not comfortably on the acceptable side (less than 1m margin), therefore assume it needs grouting.

* Worst case from potential underlying seams W = Workings, C = Solid Coal



Note:
Apparent strata dip on this section may not reflect true dip, owing to boreholes being offset in front or behind the section line.

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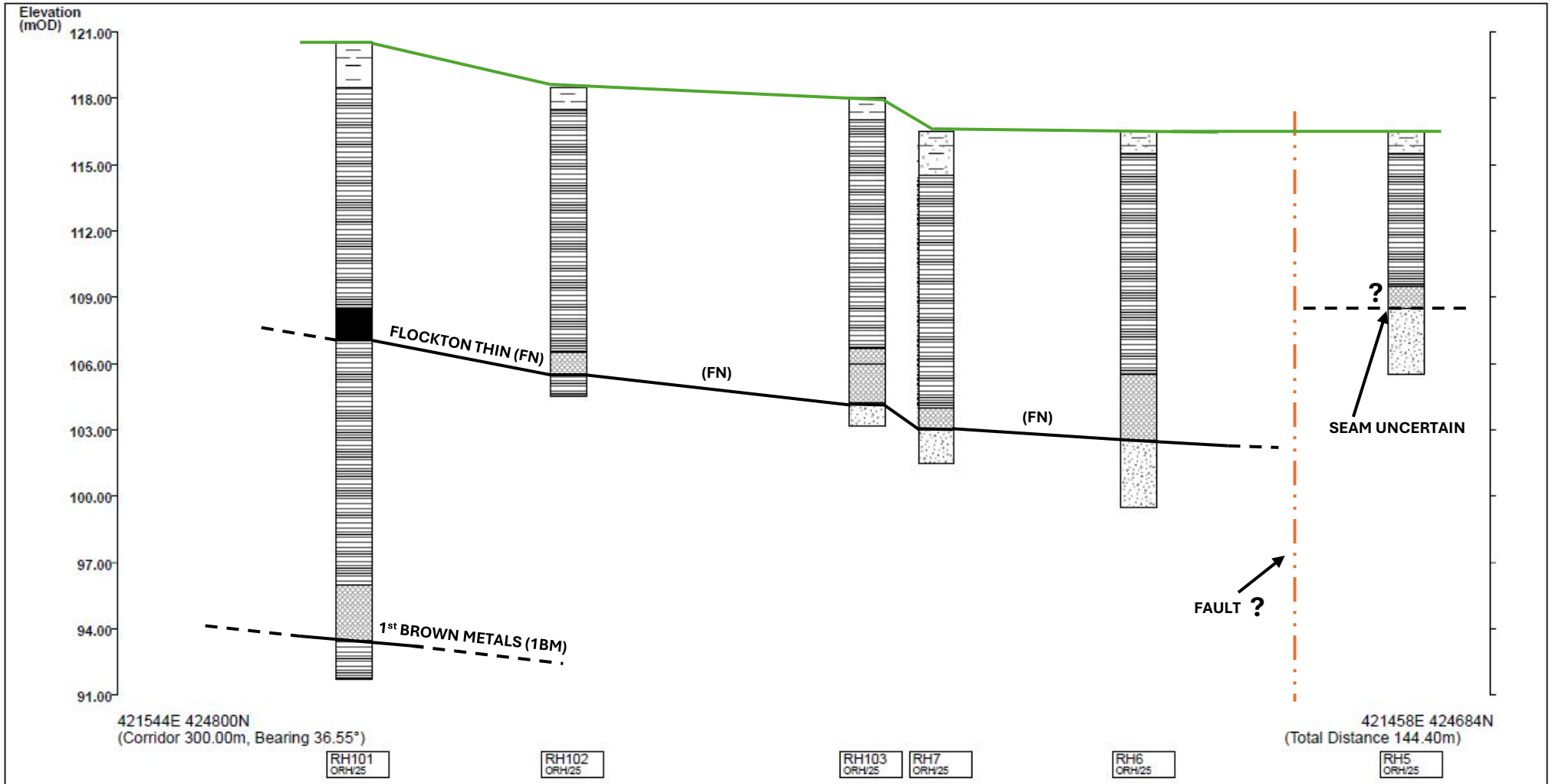
Site: Leeds Road, Heckmondwike				
Title: Geological Section 1 NE-SW				
Scale: 1:531 [H] 1:322 [V]	Drawn: W.W	Checked:	Approved:	Job No.: ORH/25
Sheet: 1 / 1	Date: 20/02/2025	Date	Date	Figure No.: ORH/25.1



Key

- Water Strike
- Water Rise
- Highest Recorded Piezo Level
- Piezo Tip
- WORKED GROUND
- HARD STRATA
- CLAY
- Silty gravelly CLAY
- MUDSTONE
- COAL

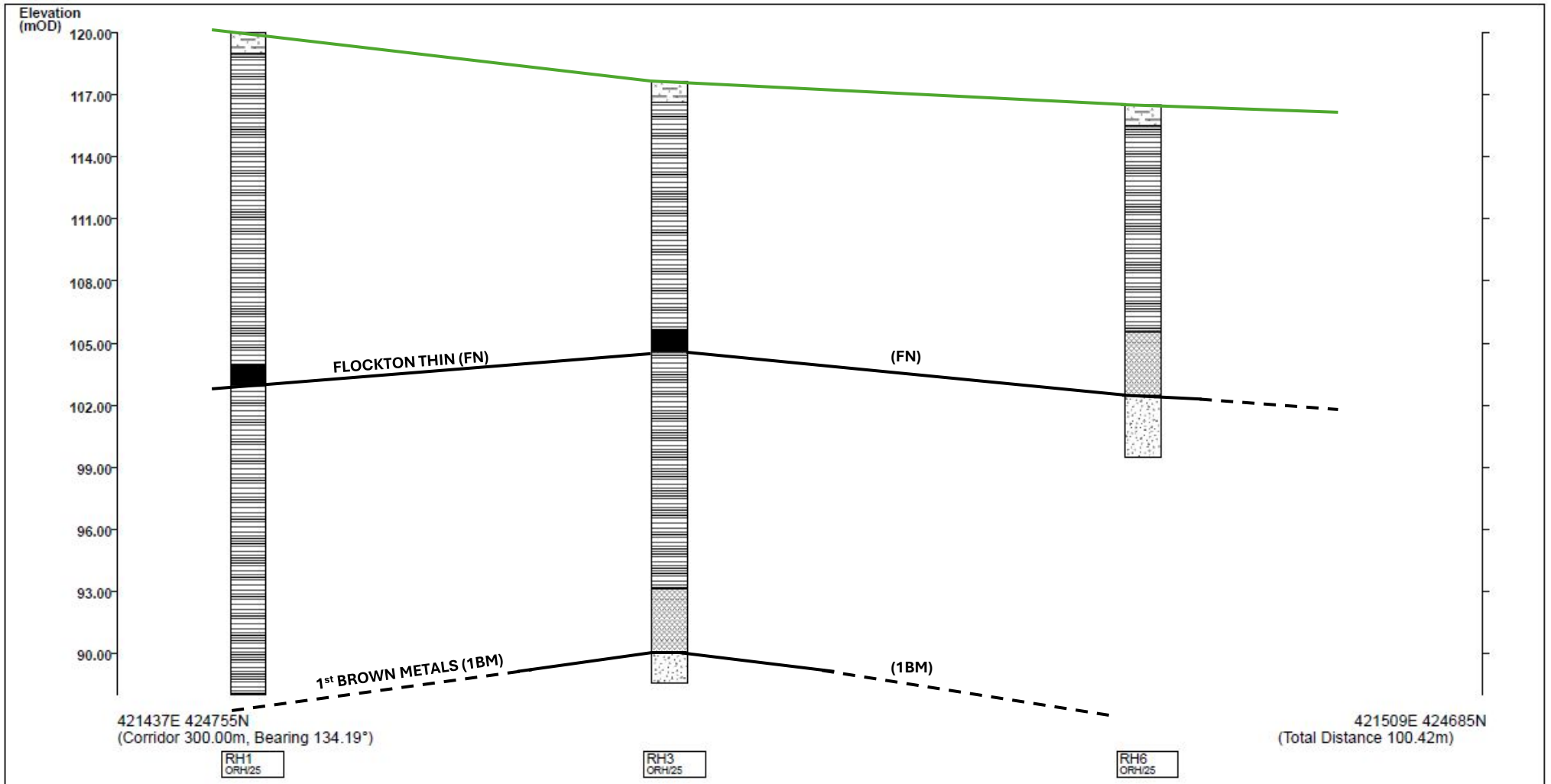
Additional Parameter: No Additonal Parameters

Horizontal Scale: 0 5 10 15 17

Note:
Apparent strata dip on this section may not reflect true dip, owing to boreholes being offset in front or behind the section line.

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site: Leeds Road, Heckmondwike				
Title: Geological Section 2 NE-SW				
Scale: 1:592 [H] 1:254 [V]	Drawn: W.W	Checked	Approved	Job No.: ORH/25
Sheet: 1 / 1	Date: 20/02/2025	Date	Date	Figure No.: ORH/25.1



Key

- Water Strike
- Water Rise
- Highest Recorded Piezo Level
- Piezo Tip
- WORKED GROUND
- HARD STRATA
- Silty gravelly CLAY
- MUDSTONE
- COAL

Additional Parameter: No Additonal Parameters

Horizontal Scale: 0 3 6 9 12

Note:
Apparent strata dip on this section may not reflect true dip, owing to boreholes being offset in front or behind the section line.

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site: Leeds Road, Heckmondwike				
Title: Geological Section 3 NW-SE				
Scale: 1:413 [H] 1:271 [V]	Drawn: W.W	Checked	Approved	Job No.: ORH/25
Sheet: 1 / 1	Date: 20/02/2025	Date	Date	Figure No.: ORH/25.1

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		120.00	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421445 E 424751 N		10/01/2025		1/4

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	OVERBURDEN		
						119.00	1.00	MUDSTONE		
							(15.00)			

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH1

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		120.00	Orion Homes Ltd	ORH/25
	Location 421445 E 424751 N	**Dates** 10/01/2025	**Engineer**	**Sheet** 2/4

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						104.00	16.00	COAL		
							(1.00)			
						103.00	17.00	MUDSTONE		

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH1

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		120.00	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421445 E 424751 N		10/01/2025		3/4

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(15.00)			

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH1

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		120.00	Orion Homes Ltd	ORH/25
	Location 421445 E 424751 N	**Dates** 10/01/2025	**Engineer**	**Sheet** 4/4

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						88.00	32.00	Complete at 32.00m		

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH1

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		124.00	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421467 E 424805 N		13/01/2025		1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	OVERBURDEN		
						123.00	1.00	MUDSTONE		
							(0.60)			
						122.40	1.60	COAL		
							(1.00)			
						121.40	2.60	MUDSTONE		

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH2

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		124.00	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421467 E 424805 N		13/01/2025		2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(26.40)			

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH2

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		124.00	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421467 E 424805 N		13/01/2025		3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						95.00	29.00	Complete at 29.00m		

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH2

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH3

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		117.60	Orion Homes Ltd	ORH/25
	Location 421461 E 424723 N	**Dates** 09/01/2025	**Engineer**	**Sheet** 1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	OVERBURDEN		
						116.60	1.00	MUDSTONE		
							(11.00)			

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH3

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH3

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		117.60	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421461 E 424723 N		09/01/2025		2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						105.60	12.00	COAL		
							(1.00)			
						104.60	13.00	MUDSTONE		
							(11.50)			

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH3

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH3

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		117.60	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421461 E 424723 N		09/01/2025		3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						93.10	24.50	BROKEN GROUND		
							(3.00)			
						90.10	27.50	HARD STRATA		
							(1.50)			
						88.60	29.00	Complete at 29.00m		

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH3

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH4

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		122.00	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421516 E 424806 N		10/01/2025		1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	OVERBURDEN		
						121.00	1.00	MUDSTONE		
							(13.00)			

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH4

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH4

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		122.00	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421516 E 424806 N		10/01/2025		2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						108.00	14.00	SOFT		
							(2.00)			
						106.00	16.00	HARD STRATA		
							(4.00)			
						102.00	20.00			

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH4

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH5

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		116.50	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421470 E 424688 N		09/01/2025		1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	OVERBURDEN		
						115.50	1.00	MUDSTONE		
							(6.00)			
						109.50	7.00	SOFT		
							(1.00)			
						108.50	8.00	HARD STRATA		
							(3.00)			

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH5

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH5

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		116.50	Orion Homes Ltd	ORH/25
	Location	**Dates**	**Engineer**	**Sheet**
	421470 E 424688 N	09/01/2025		2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						105.50	11.00	Complete at 11.00m		

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH5

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH6

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		116.50	Orion Homes Ltd	ORH/25
	Location	**Dates**	**Engineer**	**Sheet**
	421493 E 424706 N	09/01/2025		1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	OVERBURDEN		
						115.50	1.00	MUDSTONE		
							(10.00)			

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH6

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH6

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		116.50	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421493 E 424706 N		09/01/2025		2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						105.50	11.00	SOFT		
							(3.00)			
						102.50	14.00	HARD STRATA		
							(3.00)			
						99.50	17.00	Complete at 17.00m		

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH6

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH7

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		116.50	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421514 E 424717 N		09/01/2025		1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(2.00)	OVERBURDEN		
						114.50	2.00	MUDSTONE		
							(10.50)			

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH7

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH7

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		116.50	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421514 E 424717 N		09/01/2025		2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						104.00	12.50	BROKEN GROUND		
							(1.00)			
						103.00	13.50	HARD STRATA		
							(1.50)			
						101.50	15.00	Complete at 15.00m		

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH7

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH8

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		118.50	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421492 E 424752 N		10/01/2025		1/4

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	OVERBURDEN		
						117.50	1.00	MUDSTONE		
							(12.00)			

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH8

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH8

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		118.50	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421492 E 424752 N		10/01/2025		2/4

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						105.50	13.00	COAL		
							(1.00)			
						104.50	14.00	MUDSTONE		

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH8

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH8

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		118.50	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421492 E 424752 N		10/01/2025		3/4

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(18.00)			

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH8

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH8

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Soilmec SM-15 Rotary Drilling Rig.		118.50	Orion Homes Ltd	ORH/25
Location		**Dates**	**Engineer**	**Sheet**
421492 E 424752 N		10/01/2025		4/4

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						86.50	32.00	Complete at 32.00m		

Remarks

Scale (approx)	Logged By
1:50	W.W

Figure No. ORH/25.RH8

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site Leeds Road, Heckmondwike			**Borehole Number** RH101
Machine : **Flush :** **Core Dia :** mm **Method :** Rotary Cored	**Casing Diameter**	**Ground Level (mOD)** 120.50	**Client** Orion Homes Ltd	**Job Number** ORH/25
	Location 421540 E 424774 N	**Dates** 17/02/2025	**Engineer**	**Sheet** 1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(2.00)	CLAY (Driller's Description).		
						118.50	2.00	MUDSTONE (Driller's Description)		
							(10.00)			

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH101

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH101

Machine :	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush :		120.50	Orion Homes Ltd	ORH/25
Core Dia : mm	Location	Dates	Engineer	Sheet
Method : Rotary Cored	421540 E 424774 N	17/02/2025		2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						108.50	12.00	COAL (Driller's Description)		
							(1.50)			
						107.00	13.50	MUDSTONE (Driller's Description)		
							(11.00)			

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH101

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH101

Machine :	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush :		120.50	Orion Homes Ltd	ORH/25
Core Dia : mm	Location	Dates	Engineer	Sheet
Method : Rotary Cored	421540 E 424774 N	17/02/2025		3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						96.00	24.50	SOFT (Driller's Description)		
							(2.50)			
						93.50	27.00	HARD STRATA (Driller's Description)		
							(1.80)			
						91.70	28.80	Complete at 28.80m		

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH101

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site Leeds Road, Heckmondwike			**Borehole Number** RH102
Machine : **Flush :** **Core Dia :** mm **Method :**	**Casing Diameter**	**Ground Level (mOD)** 118.50	**Client** Orion Homes Ltd	**Job Number** ORH/25
	Location 421525 E 424757 N	**Dates** 17/02/2025	**Engineer**	**Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	CLAY (Driller's Description)		
						117.50	1.00	MUDSTONE (Driller's Description)		
							(11.00)			

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH102

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH102

Machine :	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush :		118.50	Orion Homes Ltd	ORH/25
Core Dia : mm				
Method :	Location	Dates	Engineer	Sheet
	421525 E 424757 N	17/02/2025		2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						106.50	12.00	SOFT (Driller's Description)		
							(1.00)			
						105.50	13.00	HARD STRATA(Driller's Description)		
							(1.00)			
						104.50	14.00	Complete at 14.00m		

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH102

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site Leeds Road, Heckmondwike			**Borehole Number** RH103
Machine : **Flush :** **Core Dia :** mm **Method :**	**Casing Diameter**	**Ground Level (mOD)** 118.00	**Client** Orion Homes Ltd	**Job Number** ORH/25
	Location 421506 E 424732 N	**Dates** 14/02/2025-17/02/2025	**Engineer**	**Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	CLAY (Driller's Description)		
						117.00	1.00	MUDSTONE (Driller's Description)		
							(10.30)			

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH103

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH103

Machine :	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush :		118.00	Orion Homes Ltd	ORH/25
Core Dia : mm				
Method :	Location	Dates	Engineer	Sheet
	421506 E 424732 N	14/02/2025-17/02/2025		2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						106.70	11.30	SOFT/COLLAPSE?? (Driller's Description)		
							(0.70)			
						106.00	12.00	BROKEN (Driller's Description)		
							(1.80)			
						104.20	13.80	HARD STRATA (Driller's Description)		
							(1.00)			
						103.20	14.80	Complete at 14.80m		

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH103

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site Leeds Road, Heckmondwike			**Borehole Number** RH104
Machine : **Flush :** **Core Dia :** mm **Method :** Rotary Cored	**Casing Diameter**	**Ground Level (mOD)** 120.50	**Client** Orion Homes Ltd	**Job Number** ORH/25
	Location 421462 E 424774 N	**Dates** 14/02/2025	**Engineer**	**Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	CLAY (Driller's Description)		
						119.50	1.00	MUDSTONE (Driller's Description)		
							(13.00)			

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH104

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH104

Machine :	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush :		120.50	Orion Homes Ltd	ORH/25
Core Dia : mm	Location	Dates	Engineer	Sheet
Method : Rotary Cored	421462 E 424774 N	14/02/2025		2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						106.50	14.00	BROKEN GROUND (Driller's Description)		
							(1.00)			
						105.50	15.00	HARD STRATA (Driller's Description)		
							(1.80)			
						103.70	16.80	Complete at 16.80m		

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH104

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH105

Machine :	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush :		123.00	Orion Homes Ltd	ORH/25
Core Dia : mm				
Method :	Location	Dates	Engineer	Sheet
	421487 E 424802 N	17/02/2025		1/1

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	CLAY (Driller's Description)		
						122.00	1.00			
							(1.00)	COAL (Driller's Description)		
						121.00	2.00			
							(2.80)	MUDSTONE (Driller's Description)		
						118.20	4.80	Complete at 4.80m		

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH105

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH106

Machine :	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush :		125.50	Orion Homes Ltd	ORH/25
Core Dia : mm				
Method :	Location	Dates	Engineer	Sheet
	421467 E 424804 N	17/02/2025		1/1

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	CLAY (Driller's Description)		
						124.50	1.00			
							(1.00)	MUDSTONE (Driller's Description)		
						123.50	2.00			
							(1.60)	COAL (Driller's Description)		
						121.90	3.60			
							(1.20)	MUDSTONE (Driller's Description)		
						120.70	4.80			
								Complete at 4.80m		

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH106

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site Leeds Road, Heckmondwike			**Borehole Number** RH107
Machine : **Flush :** **Core Dia :** mm **Method :**	**Casing Diameter**	**Ground Level (mOD)** 123.50	**Client** Orion Homes Ltd	**Job Number** ORH/25
	Location 421460 E 424801 N	**Dates** 01/02/2025	**Engineer**	**Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00)	CLAY (Driller's Description)		
						122.50	1.00	MUDSTONE (Driller's Description)		
							(0.50)			
						122.00	1.50	COAL (Driller's Description)		
							(1.50)			
						120.50	3.00	MUDSTONE (Driller's Description)		
							(13.00)			

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH107

ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site	Borehole Number
Leeds Road, Heckmondwike	RH107

Machine :	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush :		123.50	Orion Homes Ltd	ORH/25
Core Dia : mm				
Method :	Location	Dates	Engineer	Sheet
	421460 E 424801 N	01/02/2025		2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						107.50	16.00	SOFT (Driller's Description)		
							(0.80)			
						106.70	16.80	Grey MUDSTONE (Driller's Description)		
							(3.00)			
						103.70	19.80	Complete at 19.80m		

Remarks

Scale (approx)	Logged By
1:50	

Figure No. orh/25.RH107