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Helix Ltd.

**Supplementary Phase II
Geotechnical and Geo-Environmental Report**

Amethyst Lane

Reading

RG30 2EZ

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EXECUTIVE SUMMARY

Site Location	Amethyst Lane, Reading, RG30 2EZ
OS Grid Reference	469480, 172676
Development Proposals	The proposed development includes two phases. Phase 1 covers the majority of the site and it is proposed to construct 70 homes comprising a mix of houses and low-level apartment blocks (2 storeys). Phase 2 covers a small area on the western side of the site and it is proposed to construct 16 homes.
Published Geology	The proposed development includes the demolition of all existing buildings currently on site, followed by the construction of 21 residential terraced dwellings ranging from 2 to 3 stories with private rear gardens, parking, and communal soft landscaping areas. In addition, a 1-storey care facility will be constructed at the south-west corner of the site surrounded by a sensory garden to the north and a car park to the south.
Site History (Extract taken from the previous investigation (ref. 26887-HYD-XX-XX-RP-GE-1001))	The earliest available Ordnance Survey mapping (1881) shows the site to be undeveloped, with just a path running through the middle. By 1895 a small building, likely associated with the farmhouse to the south, was constructed. Residential properties were constructed in the surrounding area of the site between 1932 and 1960. In 1970, an occupational therapy centre was constructed in the south of the site and, furthermore, by 1970 an additional building had been constructed in the northern part of the site. Over time increasing residential properties have been constructed in the surrounding areas. In the current day, the buildings are now derelict and the site is no longer in use.
Ground Conditions Encountered	The super heavy dynamic probes undertaken within the footprint of the proposed residential dwellings in areas available during the pre-demolition stage generally identified competent strata with increasing N100 values with depth. However, two anomalies were encountered within DP114 and DP122 displaying significant zones of weakness which could indicate potential dissolution features or worked ground associated with historical mining. It would be expected to delineate the zones of weakness utilising both boreholes and dynamic probes with the samples collected from the boreholes providing a clearer indication of the nature of the material associated with the identified zones of weakness. Additional dynamic probes will also be undertaken post-demolition to cover the remaining footprint of the proposed residential dwellings. The results will be amended to this report.
Groundwater Encountered	Groundwater was not encountered during the intrusive investigation in excess of 0.75m bgl (maximum depth penetrated). The previous ground investigation undertaken by Hydrock indicated groundwater was not encountered during the ground investigation with one exception being BH1 reporting a level of 13.10m bgl.
Contamination	Given the findings of the desk study, walkover survey, intrusive investigation and laboratory testing a source-pathway-receptor linkage has been identified at the site, posing a risk to human health from the impacted 'Sub-Base' Made Ground soils which have been proven by both investigations to contain elevated levels of heavy metals and PAHs. Two Made Ground soil types were encountered by the previous investigation labelled 'General' Made Ground and 'Sub-Base' Made Ground. The previous investigation identified the 'General' Made Ground located in existing soft landscaping areas recorded no significantly elevated levels of contaminants. As such, the site can be zoned based on the two Made Ground soil types. Remedial measures will be required in areas of proposed soft landscaping underlain by 'Sub-Base' Made Ground as part of the proposed development outlined in section 6.4.
Waste Soil Classification	Currently, the waste soil on site is classified as follows: Blacktop: 17 03 02 - Non-Hazardous 'Sub-Base' Made Ground: 17 05 04 - Non-Hazardous <u>Waste Classification from the Previous Investigation:</u> 'General' Made Ground: 17 05 04 – Inert Natural Soil: 17 05 04 – Inert
Recommendations	We recommend a watching brief should be undertaken during the construction phase, and if during development any previously undiscovered contamination (including visual or olfactory evidence) is found then site management should be immediately informed and inspection by a suitably qualified person should be undertaken. Further recommendations are summarised in section 8. Delineate the zones of weakness (DP114 and DP122) utilising both boreholes and dynamic probes with the samples collected from the boreholes providing a clearer indication of the nature of the material associated with the identified zones of weakness. Remedial measures will be required in areas of proposed soft landscaping currently underlain by 'Sub-Base' Made Ground as part of the proposed development outlined in section 6.4.

This executive summary must be read in conjunction with the full report text

1 FACTUAL

1.1 INTRODUCTION

Geo-Integrity Ltd. were commissioned by Helix Ltd. by Consultant Appointment – Short Form dated 17th of July 2024 to undertake a Supplementary Phase 2 Ground Investigation at Amethyst Lane, Reading, RG30 2EZ.

Previously a Phase 1 Desk Study (Report Ref: 26887-HYD-XX-XX-RP-GE-1000, dated 22nd February 2023) and Phase 2 Ground Investigation Interpretative Report (Report ref:26887-HYD-XX-XX-RP-GE-1001, dated 30th May 2023) was undertaken by Hydrock. A Factual Phase 2 Ground Investigation was also undertaken by Soils Ltd., ref 20764/FR Rev1.0 the scope of which was detailed by Hydrock to aid with the interpretative reporting. The two previous investigations should be read in conjunction with this supplementary investigation.

This supplementary ground investigation addresses the following recommendations made by Hydrock:

- 1) Screening the site for infilled solution features (pre and post-demolition of existing buildings)
- 2) Further testing of the 'Sub-Base' Made Ground to confirm whether it presents a risk to human health and whether mitigation is required to ensure the site is 'suitable for use'
- 3) Further testing of Blacktop and 'Sub-Base' Made Ground soils including a HazWasteOnline assessment and WAC testing to aid with waste classification

Note: This report will be updated following the completion of the additional probes post-demolition

The site is located at National Grid Reference 469480, 172676.

The report is likely to be reviewed by Reading Borough Council with reference to the NPPF. Once the development is completed, and as a minimum, the land must not be capable of being determined as 'contaminated land' under the terms of Part IIA of the Environmental Protection Act 1990. However, it also states that "Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner."

The objectives of this Supplementary Phase II Geotechnical and Geo-Environmental Interpretive Report are: -

-  To briefly summarise the site development proposals, site setting, review of published geology and the findings of the previous investigations

- 📖 To describe and report the fieldwork undertaken at the site
- 📖 To describe and report the geotechnical and chemical laboratory work undertaken on selected samples
- 📖 To provide an interpretation of the results of this investigation with regard to the geotechnical properties, and geo-environmental and waste disposal implications for the proposed development

The investigation was performed in accordance with the general requirements of BS 5930:2015, BS EN 1997-2 (2007), BS EN ISO 22475-1 (2006) and other relevant related standards identified below. The fieldwork was undertaken across four days between the 8th and 11th of August 2024. A further stage of fieldwork is planned following the demolition of all existing buildings which will enable the completion of all dynamic probes.

1.2 SOURCES OF INFORMATION

The following sources of information have been used to compile this report: -

- 📖 Phase 1 Desk Study Report undertaken by Hydrock., (Report Ref: 26887-HYD-XX-XX-RP-GE-1000, dated 22nd February 2023)
- 📖 Phase 2 Ground Investigation Interpretative Report (26887-HYD-XX-XX-RP-GE-1001, dated 30th May 2023) which also incorporated the findings of a Phase 2 Factual Ground Investigation undertaken by Soils Ltd., ref 20764/FR Rev1.0
- 📖 The British Geological Survey (BGS) and Environment Agency (EA) websites
- 📖 A site reconnaissance visit undertaken on the 8th of July 2024
- 📖 Information from various internet sites on site history and environmental setting

It should be noted that the information provided in the desk study is obtained from independent third-party sources. It is provided in good faith, but no guarantee can be provided as to its accuracy. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.

The salient findings of the previous investigations listed above have been included in this report to provide a more comprehensive analysis of the site area. It is understood that the client has full reliance on this information (supplied) and has, therefore, been treated as such.

1.3 DEVELOPMENT PROPOSALS

The proposed development includes the demolition of all existing buildings currently on site, followed by the construction of 21 residential terraced dwellings ranging from 2 to 3 stories with private rear gardens, parking, and communal soft landscaping areas. In addition, a 1-storey care facility will be constructed at the south-west corner of the site surrounded by a sensory garden to the north and a car park to the south.

1.4 SITE WALKOVER

A site walkover was undertaken as part of this Phase II Ground Investigation on the 8th of July 2024.

The site is located in a residential area, south-west of Reading Central, situated along Amethyst Lane. The site is rectangular in shape with an area of approximately 0.5ha, a typical elevation of 58mOD and is generally flat-lying.

The site is currently derelict, previously occupied by a day-care centre comprising 3 brick-built buildings including a single-storey, T-shape building situated centrally along the southern boundary, a smaller, two-storey building situated in the south-east corner, and the largest building situated at the northern side of the site. No evidence of structural damage was recorded from observations of the building's exterior. The site also comprises existing asphalt surfaces forming the access road along the eastern boundary and parking along the northern boundary. There are also areas of soft landscaping along the western half of the site. The site was secured at the time of the walkover survey by heras fencing along the southern boundary and an earth bund was present behind the gated entrance. Overgrown vegetation was present across the entire site, including immature and mature trees, bushes, long grass, ivy, brambles, and tree saplings.

The site is surrounded by residential dwellings on all sides, with site boundaries marked by heras fencing to the south, and wooden fences to the west, north and east.

The walkover survey was undertaken to identify potential sources of contamination to aid the human-health risk assessment. No significant sources of contamination were identified, other than Made Ground soils which given the unknown origin may contain elevated levels of contaminants.

1.5 GEOLOGY

1.5.1 Published Geology

Reference to the British Geological Survey website and Sheet 268; Reading; 2000; indicates that the site is directly located on superficial soils known as the Lynch Hill Gravel Member, overlying Palaeogene bedrock known as the Lambeth Group, overlying the Cretaceous bedrock known as the Seaford Chalk and Newhaven Chalk Formation (undifferentiated) formerly known as the Upper Chalk.

A normal fault trends north to south dipping to the south-west, as such will have no bearing on the site.

1.5.2 Superficial Deposits

The **Lynch Hill Gravel Member** is described in the BGS memoir as “sand and gravel, locally with lenses of silt, clay or peat. The Lynch Hill Gravel Member is a fluvial deposit and therefore layers of sand, gravel and clays reflect the energy environment in which they were deposited. The thickness is highly variable between 1m and 12m.

1.5.3 Bedrock

The **Lambeth Group** is generally described by the BGS as “vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels, minor limestones, lignite and occasional sandstone and conglomerate. The Lambeth Group was deposited in fluvial, estuarine, lagoonal or proximal marine environments.” The thickness of this unit in the site area ranges between 6m and 27m.

The **Upper Chalk** is generally described by the British Geological Survey as a firm white chalk with nodular and tabular flint seams. The thickness of this unit is typically between 60m to 70m.

1.5.4 Solution Features

Chalk, as a calcium-carbonate-rich rock, is highly susceptible to dissolution by water containing carbon dioxide. This dissolution can create three common types of features within the chalk, grouped together under the generic term ‘dissolution features’. These features include:

- **Sinkholes:** Depressions at the ground surface caused by the collapse of overlying chalk or superficial deposits into underground voids created by dissolution. Shape and size dependent on underlying void feature

- *Solution pipes*: A feature in the surface of the Chalk caused by increased dissolution in an area of closely spaced discontinuities. These features may, or may not, have a ground surface expression. Up to 20 metres in diameter though commonly much smaller
- *Swallow Holes*: A void within the surface of the Chalk where a stream is 'swallowed' by the Chalk to flow underground. Often occur at the junction of impermeable strata and Chalk. Infilled ancient swallow holes do exist where streams used to flow and may not have any surface expression. Up to 14m in diameter, though commonly a few metres.

Reference to the Chelsea Speleological Society, Volume 17, part 9 indicates Reading is built over a number of unrecorded chalk mines. Specific reference to the Coley area of Reading, Field Rd (situated 1500m east of the site) stating "on the 14th of September 1951 the 'Berkshire Chronicle' published a news item titled "A road where floors tilt" and recalled that twenty years previously a garden shed was swallowed up by a ground collapse. In September 1951 two large craters appeared in gardens measuring 8ft across and 12ft deep and the other 7ft across and 6ft deep. The Borough Surveyor speculated that the houses were built on the site of old chalk pits which have been poorly infilled.

In the year 2000, the area was in the news again with accounts that 180 people were evacuated from Field Road when a crater appeared in the road measuring 10ft deep and 15ft wide swallowing part of the road and pavement, a motorbike, together with the lounge and front door of one house and its front garden. Damages to water pipes and gas mains were also noted. A statement from Dr Clive Edmonds said "Our investigations have found larger chalk tunnels than expected. They are twisting and turning in different directions on both sides of the road."

1.5.5 Victorian Brick Works in Reading

Geotechnical hazards in the Coley Area of Reading are known to pose risks to existing and new developments, relating to ground subsidence occurred on 4 January 2000 outside the front of two residential properties on Field Road Reading, (located approximately 1500m east of the site) with a crater 8m diameter and 4m maximum depth being formed, which caused part of the front and party walls of these properties to collapse.

The investigations showed that there were extensive historical chalk mines in the Field Road area. The mine tunnel roofs varied in depth from about 7.5m to 11m below ground level. The tunnel floors were typically around 13m to 14m below ground level and their width is typically 3m to 4m. The condition of the mines was generally found to be poor, with many areas of the roof having collapsed.

A scheme of stabilisation was developed from the results of the investigations. Grouting techniques were employed to fill the open voids beneath the ground and improve areas of poor ground conditions resulting from previous collapses of the mines.

Stabilisation of Field Road Phase 1 was completed and all affected houses were reinstated together with the gardens and the Highway. The residents of the properties that were evacuated moved back into their properties in December 2001. Full details are provided by Reading Borough Council at <https://www.reading.gov.uk/article/6120/Field-Road>.

The chalk mines dated back to 1800 civil war, and later brick works, which abstracted chalk beneath the site in unrecorded subterranean caves. It was concluded that as Victorian brick works were typically located where the resources were readily available (clay) in the ground that once the clay had been extracted, unrecorded excavation into the chalk likely took place. The chalk would have been mixed with clay from the overlying Lambeth Group for brickmaking. Some chalk may also have been burned to produce lime mortar for building purposes.

2 PREVIOUS INVESTIGATION

Previously two reports have been undertaken by Hydrock on the site including a Phase 1 Desk Study (Report Ref: 26887-HYD-XX-XX-RP-GE-1000, dated 22nd February 2023) and a Phase 2 Ground Investigation Interpretative Report (Report Ref. 26887-HYD-XX-XX-RP-GE-1001, dated May 2023) utilising a factual Phase II Ground Investigation undertaken by Soils Ltd. (ref. 20764/FR Rev1.0) the scope of which was detailed by Hydrock. The reports previously undertaken by Hydrock should be read in conjunction with this subsequent intrusive investigation. However, a summary of the information relevant to this supplementary investigation is included in tables below.

2.1 SUMMARY OF THE PREVIOUS PHASE I DESK STUDY

Relevant Information	Extracts from Previous Phase I Desk Study
Site Setting	<i>The site is located at Amethyst Lane, Reading, RG30 2EZ between the M4 and the A33, 1.75km to the south west of Reading city centre. The site is rectangular in shape with an area of approximately 0.50 hectares and is generally flat, typically at 58m above Ordnance Datum (OD). The site is a disused day-care centre comprising 3 buildings. To the east and north of the site, the buildings are surrounded by asphalt whilst to the west of the buildings, there are overgrown former garden areas. The buildings are noted to be in generally good condition.</i>
Site History	<i>The earliest available Ordnance Survey mapping (1881) shows the site to be undeveloped, with just a path running through the middle. By 1895 a small building, likely associated with the farmhouse to the south, was constructed. Residential properties were constructed in the surrounding area to the site between 1932 and 1960. In 1970, an occupational therapy centre had been constructed in the south of the site and, furthermore, by 1970 an additional building has been constructed in the northern part of the site. Over time increasing residential properties have been constructed in the surrounding areas. In the current day the buildings are now derelict and the site is no longer in use.</i>
Published Geology	<i>The superficial geology comprises the Lynch Hill Gravel Member, which is recorded as consisting of sands and gravels. The solid geology comprises the Lambeth Group (variable sequences of mainly clay, some silty or sandy, with sands and gravels) underlain by the Seaford Chalk Formation (generally firm white chalk with nodular and tabular flint seams).</i>
Hydrogeology	<i>The Environment Agency classes the geology as outlined in Section 2.5 as:</i> <i>Lynch Hill Gravel Member: Secondary A Aquifer.</i> <i>Lambeth Group: Secondary A Aquifer.</i> <i>Seaford Chalk Formation: Principal Aquifer.</i> <i>There are no active licensed groundwater abstractions within 1km of the site, The site is not within a groundwater Source Protection Zone (SPZ).</i>
Hydrology	<i>There are no surface water features recorded within 250m of the site. There are no active licensed surface water discharges or abstractions within 1km of the site.</i>
Mining or Mineral Extraction:	<i>The environmental report indicates that gravel and sand quarrying has been undertaken in the wider area, although not within the site boundaries. Stantec factual cavities database search report (Ref: 332511450/CBH/SC/HG/JN, dated 16 February 2023) details the distance, location and nature of recorded cavities in the vicinity of site. The report records similar features as detailed in the Groundsure report with the addition of a historical brick works/clay pit 380m to the north.</i>
Natural Chalk Cavities	<i>There is no evidence that cavities have been, or are present, on the site. However, it should be noted the site is covered predominantly by hardstanding and buildings. Records of natural cavities indicates that there is a recorded solution pipe feature 156m north east of the site with six further records of natural cavities within 500m of the site (including solution pipes and sink holes). Records indicate that these features are within the same geology as present on site.</i>

	<i>The Groundsure report noted the risk of dissolution features to be negligible however Hydrock consider that there is a risk of features being present due to the number of cavities noted in the vicinity of site and underlying geology.</i>
Natural Ground Instability	<i>Trees and hedges are present around the site boundaries and sporadically across the site. Cohesive deposits of the Lambeth Group may be affected by potential for shrink-swell ground movements in clays as a result of changes in moisture content from removal or growth of trees. Made Ground is likely to be present across the majority of the site, due to historic structures. This represents a geotechnical risk due to the presence of heterogeneous Made Ground. Foundations will need to be deepened to below the Made Ground.</i>
Potential Sources of Contamination	» <i>Made Ground, associated with historical construction activities and fill, possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials (ACM), Poly Aromatic Hydrocarbons (PAHs) and petroleum hydrocarbons (S01).</i> » <i>Ground gases (carbon dioxide and methane) from organic materials in the Made Ground (S02).</i> » <i>Asbestos within existing buildings (S03).</i>

2.2 SUMMARY OF THE PREVIOUS PHASE 2 INTERPRETATIVE REPORT (REF: 26887-HYD-XX-XX-RP-GE-1001)

Relevant Information	Extracts from Previous Phase 2 Interpretative Report				
Sitework	» 2 trial pits to a maximum depth of 3.00m bgl; » TRL DCP testing; » 7 dynamic probes to a maximum depth of 10.10m bgl; » 6 windowless sampler boreholes to a maximum depth of 6.00m bgl; » 1 cable percussion borehole to a depth of 20.00m bgl; and » 2 soakaway tests within trial pits.				
Ground Conditions	Stratum	Depth to top (m bgl)	Depth to base (m bgl)	Thickness (m) (range)	Thickness (m) (average)
	Surface Cover – bituminous bound pavement hardstanding	0.00	0.07 - 0.20	0.07 - 0.20	0.13
	'General' Made Ground	0.00 - 0.45	0.55 - 1.75	0.15 - 1.75	0.69
	'Sub Base' Made Ground	0.07 - 0.20	0.30 - 0.60	0.20 - 0.40	0.29
	Lynch Hill Gravel Member	0.30 - 1.75	4.25 - 5.40	3.45 - 5.10	4.38**
	Lambeth Group	4.25 - 5.40	11.50*	6.50*	6.50*
	Seaford Chalk Formation	11.50	>20.00	>8.50	Not proven
	Two main types of Made Ground present at the site: » 'Sub Base' Made Ground: located underneath the asphalt hardstanding to a maximum recorded depth of 0.60m below ground level (bgl). This generally comprised a locally slightly clayey sandy gravel / sands and gravels; gravel is noted to comprise limestone and flint, with some localities also encountering anthropogenic material such as brick and clinker. » 'General' Made Ground: this type of Made Ground was highly variable across the site, and was found to either underlie the Sub Base Made Ground from between 0.40m to 0.45m bgl or, where asphalt was not present, from the surface to a maximum depth of 1.75m bgl. The Made Ground was encountered generally as a soft to firm sandy gravelly clay / gravelly clayey sand, with the gravel comprising flint, clinker, brick and concrete. Made Ground is deepest between or adjacent to the structures present on site and so may be associated with the historic construction. In its uppermost section, the Lynch Hill Gravel Member was generally encountered as a soft to firm / firm brown slightly gravelly sandy clay. This was noted to transition, with depth, into dense orangish brown sands and gravels, or a gravelly sand. For the most part, the Lambeth Group was encountered as a very dense yellowish brown slightly silty fine to medium sand; however, the unit was also noted to locally consist of sandy silty clay.				

	<i>The Seaford Chalk Formation was found to consist of structureless chalk (likely Grade Dm/ Dc), recovered as fine to coarse gravel sized clasts of weak to moderately dense chalk in a silty matrix.</i>																																																															
Groundwater	<i>Groundwater was not encountered during the investigation or the post fieldwork monitoring.</i>																																																															
Preliminary Assessment of Dissolution Features	<i>No evidence of solution hollows are visible on site and the dynamic probes do not indicate any significant zones of strength loss or loose materials. Five of the seven probes show a general trend of strength increasing with depth refusing between 7.90m – 8.30m bgl with WSDP1 achieving termination depth of 10.00m bgl. This is considered to be refusing on sand bands within the Lambeth Group and do not present as potential solution features. Locations WSDP4 and WSDP5 near the site boundary (east and west respectively) show that low strength/loose deposits are present between 2.00m – 5.00m bgl. This is considered to be localised loose sands or water softened clays. These are however not considered to be dissolution features and also are not with the footprints of any proposed plots/structures.</i>																																																															
Subsidence Risk Conclusions	<i>Using Edmonds predicting natural cavities in chalk methodology show the site is considered to be within an area of moderate risk. This is based on the thickness and type of geology present and the regional setting of the site. It is considered that the Groundsure data, which indicates a negligible risk, would not have taken into the consideration of the ground conditions as proven by the investigation as this is not available to them. The moderate subsidence risk calculated coupled with the number of features noted to be present within a 500m radius, within the same geological setting, is considered to be and more accurate representation of the risk posed to the development.</i>																																																															
Geo-Environmental Testing	<i>Seventeen soil samples were screened against the relevant GAC for a 'Residential without the consumption of home-grown produce' and 'public open space (residential)' land-use scenarios. Of the seventeen soils samples, six samples were recovered from the 'Sub-Base' Made Ground, six samples from the 'General' Made Ground and five samples were recovered from the underlying natural soils.</i>																																																															
Assessment Results	<i>Hydrock determined the following chemicals of potential concern (CoPC) which require further assessment:</i> <table><tr><th>CoPC</th><th>GAC (mg/kg)</th><th>GAC Source</th><th>No. samples</th><th>Min (mg/kg)</th><th>Max (mg/kg)</th><th>No. samples >GAC</th></tr><tr><td colspan="7"><i>Made Ground Sub Base 'Residential with homegrown produce'</i></td></tr><tr><td>Arsenic</td><td>37</td><td>C4SL</td><td>6</td><td>5</td><td>170</td><td>1</td></tr><tr><td>Beryllium</td><td>1.7</td><td>Hydrock GAC</td><td>6</td><td>0.5</td><td>2.5</td><td>1</td></tr><tr><td>Lead</td><td>200</td><td>C4SL</td><td>6</td><td>8</td><td>748</td><td>1</td></tr><tr><td colspan="7"><i>Made Ground Sub Base 'Public Open Space (residential)'</i></td></tr><tr><td>Arsenic</td><td>79</td><td>C4SL</td><td>6</td><td>5</td><td>170</td><td>1</td></tr><tr><td>Beryllium</td><td>2.2</td><td>Hydrock GAC</td><td>6</td><td>0.5</td><td>2.5</td><td>1</td></tr><tr><td>Lead</td><td>630</td><td>C4SL</td><td>6</td><td>8</td><td>748</td><td>1</td></tr></table> <i>No exceedances from samples within the Made Ground 'general' or Lynch Hill Gravel Member were recorded. No visible evidence of asbestos containing materials (ACM) was recorded during the investigation and ACM or asbestos fibres were not detected during laboratory testing of samples. No further consideration of asbestos in soils is required.</i>	CoPC	GAC (mg/kg)	GAC Source	No. samples	Min (mg/kg)	Max (mg/kg)	No. samples >GAC	<i>Made Ground Sub Base 'Residential with homegrown produce'</i>							Arsenic	37	C4SL	6	5	170	1	Beryllium	1.7	Hydrock GAC	6	0.5	2.5	1	Lead	200	C4SL	6	8	748	1	<i>Made Ground Sub Base 'Public Open Space (residential)'</i>							Arsenic	79	C4SL	6	5	170	1	Beryllium	2.2	Hydrock GAC	6	0.5	2.5	1	Lead	630	C4SL	6	8	748	1
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Lead	630	C4SL	6	8	748	1																																																										
Geo-Environmental Human Health Risk Assessment	<i>The screening exercise has identified Arsenic, Beryllium and Lead in Made Ground 'Sub Base' soils at concentrations above the GAC for both a residential with homegrown produce and public open space (residential) land uses. These are considered further here to assess if the exceedance may be acceptable with respect to the proposed development. The phrase 'further assessment' does not necessarily mean that the soil is 'contaminated' or not fit for use. The exceedances of lead (748 mg/kg vs. the GAC of 200 mg/kg) and arsenic (170 mg/kg vs. the GAC of 37 mg/kg) are noted in one sample and are significant for a residential with home grown produce land use and, as such, pose a risk in areas where soft landscaping is proposed, which requires mitigation for the proposed end use. Furthermore, whilst the GAC for both of the above are higher for a public open space (residential) land use, the exceedances are still considered to be significant when compared to the GAC and, as such, mitigation will also be required in areas of proposed public open space / soft landscaping.</i>																																																															

	<i>Whilst the exceedance of beryllium is only slight (2.5 mg/kg vs. the GAC of 1.7 mg/kg), mitigation will already be required due to the exceedance of lead and arsenic within the Made Ground 'Sub Base' soils. Therefore, the requirement to mitigate the arsenic and lead will also serve to 'mitigate' against the beryllium in Made Ground 'Sub Base' soils.</i> <i>It is considered that with further investigation and testing that the areas requiring mitigation could be further defined and zoned.</i>
Risk To Controlled Water	<i>The DWS are not exceeded and no further assessment is required for the Made Ground General. Whilst elevated levels of arsenic and lead in the Made Ground sub base pose a risk to human health on consideration of the thickness of the stratum, that only 1 of 6 samples exceeded, the thickness of the unsaturated zone and the solubility of metals it is unlikely to pose a significant risk to the Chalk aquifer.</i>
Recommendations	Geotechnical: <i>No evidence of infilled solution features in the investigation. However, the number of positions is limited and not all building footprints were able to be investigated due to the structures still present on site. It is recommended that a post-demolition (site-wide) geophysical survey to manage risk of subsidence, with targeted boreholes, as proven to be necessary is undertaken.</i> Geo-Environmental: <i>1 of 6 samples of the Made Ground (Sub base) contains elevated levels of contamination requiring remediation.</i> <i>Further investigation and assessment are required to ascertain whether this sample is anomalous or whether the levels of contamination recorded are reflective of the chemical composition of the sub base site-wide.</i> <i>In the absence of further investigation and assessment, or if further testing confirms the sub base to be 'contaminated', the following mitigation would be required.</i> <i>The mitigation measures include:</i> <i>» Either the removal of the Made Ground or the installation of a 600mm engineered cover system in gardens and public open space, comprising a bonded geogrid break layer (e.g., TX160G), subsoil beneath a topsoil thickness of between 150mm and 300mm, to ensure site users do not come into contact with these soils (PL1).</i> <i>» Asbestos demolition survey and removal by a specialist contractor, if asbestos is present (PL2).</i> <i>The methodology for the remediation should be set out in a Remediation Strategy (which will include the 'Implementation Plan', the 'Verification Plan' and the 'Long Term Monitoring and Maintenance Plan'), which will need to be submitted to the warranty provider and the regulatory authorities for approval.</i>

3 SUPPLEMENTARY PHASE II INTRUSIVE INVESTIGATION

3.1 SITE WORK AND SAMPLING STRATEGY

The fieldwork was undertaken in accordance with BS 5930:2015, BS EN 1997-2 (2007) and BS EN ISO 22475-1 (2006), with the exploratory locations being selected by Geo-Integrity Ltd. The exploratory hole locations can be seen in the Appendices.

Hydrock recommended further assessment of dissolution features at this site which may include a geophysical survey post demolition. Geo-Integrity Ltd. have adopted an intrusive method to assess the potential risk of dissolution features or underground mining in the form of dynamic probes which will be undertaken pre and post demolition. Dynamic probing provides a direct and continuous assessment of the 'ground strength'. The results from dynamic probing can be used to interpret the various layers of strata including areas of soft or voided ground which may indicate potential dissolution features or worked ground associated with historic mining. Dynamic probing cannot be used to definitively confirm the actual composition of the strata, however should soft or voided areas be encountered this would indicate the need for further assessment including additional probes and boreholes.

The fieldwork was undertaken between the 8th and 11th of March 2024 consisted of thirty super heavy dynamic probes (DP101 – DP130) pre demolition and four hand dug trial pits (HA1 – HA4).

Dynamic probes were undertaken along the supporting walls of the proposed residential dwellings to investigate potential zones of weakness or voids which may indicate potential dissolution features or worked ground associated with historic mining.

Hand-dug trial pits were also undertaken to log and sample near surface soils underlying existing hardstanding areas where the previous investigation identified elevated levels of heavy metals. One of the objectives of the report was to better characterise the impacted 'Sub-Base' Made Ground underlying the existing hardstanding areas with the aim of potentially zoning areas requiring remediation.

Disturbed samples were taken at selected depths down to the base of the exploratory holes for subsequent laboratory testing and inspection. On completion, all trial pits were carefully backfilled with arisings in thin layers, ensuring that the excavated material was replaced in the same order as it had been removed.

3.2 GROUND CONDITIONS

3.2.1 Summary

The site and laboratory test work revealed that the general succession of strata can be represented by Hardstanding, underlain by Made Ground, underlain by the Lynch Hill Gravel Member.

Descriptions of the strata encountered are given on the exploratory hole records and are summarised below. Further information is provided on the exploratory hole logs within the Appendices.

3.2.2 Hardstanding

Encountered in each of the four exploratory holes from ground level down to depths ranging between 0.05m to 0.10m bgl. Hardstanding was encountered as tarmac.

3.2.3 'Sub-Base' Made Ground

Encountered in each of the four exploratory holes from depths ranging between 0.05m to 0.10m bgl down to depths ranging between 0.40m and >0.75m bgl. Made Ground soils were encountered as loose to medium dense, grey brown, slightly silty, slightly sandy gravel, gravels being fine to coarse sub-angular limestone, brick, flint and slate. The granular Made Ground soil encountered during this intrusive investigation match the 'Sub-Base' Made Ground identified from the previous investigation.

HA1 refused as hand-digging techniques could not penetrate through brick encountered at a depth of 0.50m bgl, potentially reflecting a historic footing.

3.2.4 Lynch Hill Gravel Member

Encountered in two exploratory holes (HA2 and HA4) from depths of 0.25m and 0.60m bgl down to the base of the exploratory holes in excess of 0.75m bgl. The material was encountered as medium dense, orange, brown, clayey, silty, sandy gravel, gravels being fine to coarse sub-angular flint.

3.2.5 Groundwater

Groundwater was not encountered during the intrusive investigation in excess of 0.75m bgl (maximum depth penetrated). The previous ground investigation undertaken by Hydrock indicated groundwater was not encountered during the ground investigation with one exception being BH1 reporting a level of 13.10m bgl.

3.2.6 Super Heavy Dynamic Probing (Pre-Demolition)

Dynamic probes results have been correlated to the ground profile identified from the previous investigation. As such dynamic probes from this investigation have been grouped and assigned a borehole from the previous investigation.

DP101 – DP105 (Correlated with WS5/DP5 from the Previous Investigation):

The ground conditions encountered within WS5 from the previous investigation identified granular Made Ground soils down to a depth of 0.55m bgl, overlying firm to stiff clay down to a depth of 1.60m bgl, overlying sand and gravel down to 2.50m bgl, overlying thin beds of alternating clay and sand down to a depth of 3.00m bgl, overlying sand and gravel down to the base of the borehole in excess of 6.00m bgl. DP5 from the previous investigation encountered zones of low strength present between 2.00m and 5.00m bgl, interpreted by Hydrock to be localised loose sands or water softened clays, and not evidence of dissolution features.

DP101 – DP105 support the findings of the previous investigation with low strength profiles between 2.00m and 5.00m bgl identified. Particularly DP104 and DP105 recorded 0 values at depths between 3.60m and 3.80m bgl and between 3.80m and 3.90m bgl, respectively. These depths correspond to the thin bands of alternating clay and sand where it would be expected perched water levels exist supporting the interpretation of loose sands and water softened clay soils and not considered evidence of dissolution features.

DP106 – DP112 (Correlated with WS7 from the Previous Investigation):

The ground conditions encountered within WS7 from the previous investigation identified granular Made Ground soils down to a depth of 0.35m bgl, overlying cohesive Made Ground down to a depth of 0.80m bgl, overlying very stiff clay down to a depth of 1.65m bgl, overlying alternating thin beds of clay and sand down to a depth of 4.25m bgl, overlying sand down to the base of the borehole in excess of 6.00m bgl. DP7 from the previous investigation encountered no soft zones with an increasing strength profile with depth.

DP106 – DP112 support the findings of the previous investigation with increasing strength profiles with depth. Variations in the data include significant spikes at a depth of 3.00m bgl within DP111 and DP112 which is interpreted to reflect a very dense granular layer. DP106 recorded N100 values of 0 between 1.90m and 2.00m bgl. It is interpreted this thin band of low strength correlates with the adjacent dynamic probes undertaken at DP104 and DP105. The zone of low strength is not

significant in thickness similar to the adjacent probes and therefore is interpreted to reflect loose sands or water softened clay soils and not considered evidence of dissolution features.

DP113 – DP121 (Correlated with WS4, WS6 and BH1 from the Previous Investigation):

The ground conditions encountered within WS6 and WS4 from the previous investigation identified granular Made Ground down to a depth of 0.60m bgl, overlying alternating thin layers of sand, gravel and clay, overlying predominantly sand and gravel down to a proven depth of 12.00m bgl, overlying structureless chalk (Grade Dm/Dc) down to the base of the borehole in excess of 20.00m bgl. DP4 and DP6 from the previous investigation show similar strength profiles with increasing strength with depth and no evidence of weak or voided ground.

DP113, DP115 - DP121 support the findings of the previous investigation with increasing strength with depth and no significant evidence of weak or voided ground which may indicate potential solution features.

An anomaly was encountered within DP114 where a significant thickness of weaker material was encountered between 2.10m and 2.90m bgl mainly recording N100 values of 0. Dynamic probes surrounding DP114 included DP113 to the north, DP115 to the south and DP118 to the west each recording competent ground with no significant zones of weakness. Given the thickness of this zone of weakness further assessment will be required including additional boreholes and dynamic probes to interpret the reason for this localised zone of weakness.

DP122 – DP130 (Correlated with WS3 from the Previous Investigation):

The maximum depth achieved from the previous investigation at the south-west corner of site covered by WS2 and WS3 was 2.70m bgl (WS3). This previous borehole encountered Made Ground down to a depth of 1.75m bgl, overlying sand and gravel down to a depth of 2.70m bgl. The location of WS2/DP2 from the previous investigation is recorded on the exploratory hole plan, however the log and probe results are not included in the report. DP3 indicates competent strata down to the final probe depth in excess of 7.00m bgl. No significant zones of weakness which could indicate potential dissolution features were recorded, however a slightly softer zone was encountered at a depth of 5.00m bgl.

DP123 – DP130 show similar strength profiles with competent strata down to the base of the probes. Similarly, a soft zone was encountered between 4.00m and 5.00m bgl interpreted to reflect a layer of loose sand or water softened clay.

An anomaly was encountered within DP122 where a low strength profile was encountered down to the base of the probe at 10.00m bgl. No major fluctuations in strength were recorded which has been typical within the Lambeth Group at this site. It is considered the material encountered within DP122 is significantly different than the surrounding area which could be interpreted as a potential solution feature or worked/infilled ground associated with historic mining. Further assessment will be required including additional boreholes and probes to interpret the reason for this localised low strength profile.

3.2.7 Evidence of Contamination

Made Ground soils were encountered underlying the existing hardstanding in HA1 – HA4 the description of which matches the material described as ‘Sub-Base’ Made Ground from the previous investigation undertaken by Hydrock which was locally found to be impacted with elevated heavy metals.

4 GEO-ENVIRONMENTAL TESTING

Geo-environmental laboratory testing was scheduled by Geo-Integrity on five soil samples recovered during the fieldwork. The testing was carried out at an MCERTS and UKAS-accredited laboratory. The results are presented in the Appendices.

Five soil samples were tested for a varied suite containing the following

-  Metals and inorganic substances
-  Speciated Polyaromatic Hydrocarbons (PAH)
-  Benzene, Toluene, Ethylbenzene and Xylene (BTEX)
-  Total Petroleum Hydrocarbons (TPH), with eight band split
-  The five Made Ground samples were tested for the presence of asbestos

Two samples recovered at a depth of 0.75m bgl (one Made Ground sample/ one natural soil sample) were tested for suite of hydrocarbons, volatile organic compounds (VOCs), and Semi-volatile organic compounds (SVOCs) as part of the UKWIR Suite to assess whether barrier pipe is required for underground water pipes.

Additionally, blacktop testing was undertaken on two representative samples of tarmac and WAC testing was also on a representative sample of 'Sub-Base' Made Ground to aid the waste classification.

5 GEOTECHNICAL INTERPRETIVE SECTION

5.1 INTERPRETATION OF DYNAMIC PROBES (PRE-DEMOLITION)

The super heavy dynamic probes undertaken within the footprint of the proposed residential dwellings in areas available during the pre-demolition stage generally identified competent strata with increasing N100 values with depth. The previous investigation undertaken by Hydrock identified localised and thin zones of weaker material interpreted by Hydrock to be localised loose sands or water softened clays, and not evidence of dissolution features. Similarly, this investigation identified thin zones of weakness within DP104 and DP105 where N100 values of 0 were encountered at depths between 3.60m and 3.80m bgl and between 3.80m and 3.90m bgl, respectively. These depths correspond to thin bands of alternating clay and sand where it would be expected perched water levels exist supporting the interpretation of loose sands and water softened clay soils and not considered evidence of dissolution features or Worked Ground associated with historic mining.

However, two anomalies were encountered within DP114 and DP122 displaying significant zones of weakness which could indicate potential dissolution features or worked ground associated with historical mining.

DP114 encountered a significant zone of weakness between 2.10m and 2.90m bgl mainly recording N100 values of 0. In addition, DP122 encountered a consistent low strength profile down to the base of the probe at 10.00m bgl. No major fluctuations in strength were recorded which has been typical within the Lambeth Group at this site. It is considered the material encountered within DP122 is significantly different than the surrounding area which could be interpreted as a potential solution feature or worked/infilled ground associated with historic mining.

The previous investigation undertaken by Hydrock recommends the use of shallow foundations following an assessment of potential dissolution features. As two anomalies have been identified which could indicate potential dissolution features further investigation is required to assess the suitability of shallow foundations. **It would be expected to delineate the zones of weakness utilising both boreholes and dynamic probes with the samples collected from the boreholes providing clearer indication of the nature of the material associated with the identified zones of weakness. Should further investigation prove the presence of dissolution features or worked/infilled ground associated with historic mining alternative foundations may be required or further consideration made to reinforced foundations capable of bridging voids which might develop anywhere beneath the structure.**

6 GEO-ENVIRONMENTAL INTERPRETATIVE SECTION

6.1 RISKS TO HUMAN HEALTH

6.1.1 Introduction

Environment Agency guidance LCRM *Land Contamination: Risk Management*, (EA, 2019), states that human health risk assessment should be undertaken by a tiered approach using the source-pathway-receptor principle. A desk study constitutes the first tier, and this was previously undertaken by Hydrock., (Report Ref: 26887-HYD-XX-XX-RP-GE-1000, dated 22nd February 2023). This was followed by a Phase II Interpretative Ground Investigation also undertaken by Hydrock (Report Ref. 26887-HYD-XX-XX-RP-GE-1001, dated 30th May 2023).

The previous phase II report concluded:

Two main types of Made Ground present at the site:

-  **'Sub Base' Made Ground:** located underneath the asphalt hardstanding to a maximum recorded depth of 0.60m below ground level (bgl). This generally comprised a locally slightly clayey sandy gravel / sands and gravels; gravel is noted to comprise limestone and flint, with some localities also encountering anthropogenic material such as brick and clinker.
-  **'General' Made Ground:** this type of Made Ground was highly variable across the site, and was found to either underlie the Sub Base Made Ground from between 0.40m to 0.45m bgl or, where asphalt was not present, from the surface to a maximum depth of 1.75m bgl. The Made Ground was encountered generally as a soft to firm sandy gravelly clay / gravelly clayey sand, with the gravel comprising flint, clinker, brick and concrete. Made Ground is deepest between or adjacent to the structures present on site and so may be associated with the historic construction.
-  1 of 6 samples of the 'Sub-Base' Made Ground contains elevated levels of arsenic, beryllium and lead when compared to the relevant GAC for residential with the consumption of home-grown produce
-  Further investigation and assessment are required to ascertain whether this sample is anomalous or whether the levels of contamination recorded are reflective of the chemical composition of the sub base site-wide

In the absence of further investigation and assessment, or if further testing confirms the sub base to be 'contaminated', the following mitigation would be required.

-  Either the removal of the 'Sub-Base' Made Ground or

- The installation of a 600mm engineered cover system in gardens and public open space, to ensure site users do not come into contact with these soils

Therefore, one of the objectives of this supplementary investigation was to undertake additional sampling and testing of the 'Sub-Base' Made Ground soils to prove whether the single elevated sample from the previous investigation is anomalous or whether the levels of contamination are reflective of this sub-base material.

Results are analysed under the second tier, known as a Generic Quantitative Risk Assessment (GQRA), which uses generic guideline values to compare site chemical data against, and the final tier would be a Detailed Quantitative Risk Assessment (DQRA), which uses data derived from the ground investigation to assess risks to identified receptors.

The assessment included in this report comprises a GQRA, which is undertaken by comparing soil contaminant concentrations from this investigation with conservative Generic Assessment Criteria (GAC). GAC for various land use and exposure scenarios have been selected from the following sources:

- CL:AIRE Category 4 Screening Levels (C4SL);
- LQM Suitable for Use Levels (S4UL);
- CL:AIRE/EIC/AGS GAC

The GAC have been derived using the Environment Agency Contaminated Land Exposure Assessment (CLEA) model, for a range of land uses and exposure scenarios, including:

- Residential with the consumption of home-grown produce;
- Residential without the consumption of home-grown produce;
- Commercial;
- Allotments;
- Public Open Space near residential housing (POS_{resi}); and
- Public Open Space public park scenario (POS_{park})

Given the proposed development will include the construction of residential dwellings with private garden areas a "Residential with the consumption of home-grown produce" land-use scenario has been selected, for this assessment. The proposed development will also include communal landscaped areas therefore a public open space near residential housing (POS_{resi}) land-use has also been considered where suitable.

6.2 RESULTS OF THE CHEMICAL TESTING

Five 'Sub-Base' Made Ground soil samples were screened as part of this investigation

'Sub-Base' Made Ground soil samples:

-  HA1 at a depth of 0.20m bgl
-  HA2 at a depth of 0.20m bgl
-  HA3 at a depth of 0.30m bgl
-  HA4 at a depth of 0.20m bgl
-  HA4 at a depth of 0.50m bgl

The above samples were screened against the relevant GAC for a "Residential with the consumption of home-grown produce" land use scenario and "Public open space near residential housing (POSresi)" as described above and identified elevated levels of arsenic within two samples and a third sample recording elevated levels of three polycyclic aromatic hydrocarbons.

6.2.1 Asbestos

Screening for the presence of asbestos did not reveal any asbestos containing material (ACM) or fibres in the five 'Sub-Base' Made Ground samples tested.

6.2.2 Arsenic

Elevated concentrations of arsenic were encountered within two 'Sub-Base' Made Ground soil samples taken from HA3 at a depth of 0.30m bgl and HA4 at a depth of 0.50m bgl. Elevated concentrations were recorded at 140mg/kg and 220mg/kg respectively.

The relevant GAC for a "residential with the consumption of home-grown produce" land-use scenario for arsenic is 37mg/kg.

The relevant GAC for a "public open space near residential housing (POSresi)" land-use scenario for arsenic is 79mg/kg.

6.2.3 Polycyclic Aromatic Hydrocarbons

Elevated concentrations of three polycyclic aromatic hydrocarbons were encountered within one Made Ground sample taken from HA1 at a depth of 0.20m bgl including benzo(b)fluoranthene, benzo(a)pyrene and dibenz(a,h)anthracene. The table below presents measured concentrations alongside the two relevant GACs.

<i>Determinant</i>	<i>Recorded concentration mg/kg (HA1 0.20m bgl)</i>	<i>GAC (residential with the consumption of home-grown produce)</i>	<i>GAC (public open space near residential housing (POSresi)</i>
<i>Benzo(a)pyrene</i>	5	5	5.7
<i>Benzo(b)fluoranthene</i>	8	8	7.1
<i>Dibenz (a,h)anthracene</i>	0.95	0.24	0.57

As shown benzo(b)fluoranthene and dibenz(a,h)anthracene are elevated above both the relevant GAC. However, Benzo(a)pyrene is recorded at the GAC for residential and lower than the GAC for public open space.

6.3 RISK TO END USERS

Given the findings of the previous desk study and intrusive investigation undertaken by Hydrock, and the supplementary laboratory testing undertaken on selected samples from the 'Sub-Base' Made Ground from this investigation a source-pathway-receptor linkage has been identified at the site, posing a risk to human health from elevated concentrations of arsenic, beryllium, lead and PAHs recorded within five samples (2 samples from Hydrock, 3 samples from Geo-Integrity) recovered from the 'Sub-Base' Made Ground . Given the significant number of samples which encountered elevated levels of contamination it is not currently considered appropriate to zone areas of the 'Sub-Base' Made Ground.

The previous investigation undertaken by Hydrock proved the 'General' Made Ground soils forming the landscaped areas along the western and eastern side of the site contain no significantly elevated levels of contaminants. Therefore, mitigation measures will not be required in areas where 'General' Made Ground was encountered. As such, the site can be zoned separating areas of 'General' Made Ground not require remediation and 'Sub-Base' Made Ground which will require remediation.

The 'Sub-Base' Made Ground is considered to underly all existing areas of hardstanding. As the near surface soils underlying the existing buildings have not been tested it is considered appropriate to include these soils within the zone of 'Sub-Base' Made Ground as shown on the plan in Appendix A.

We recommend that the conclusions of this report are agreed with the relevant Local Authority at the earliest stage, to reduce potential delays to the development.

6.4 REDUCING THE RISK TO END USERS

6.4.1 *Clean Cover Layer*

To break the exposure pathways to site users, it is considered that the pathway between the contaminated 'Sub-Base' Made Ground soils and the end users needs to be broken. These areas can be seen on the Zoned Diagram in the Appendix depicting areas where 'General' Made Ground and 'Sub-Base' Made Ground was encountered.

As such a cover system could be engineered within areas of soft landscaping. It is considered that any disturbance or intermixing of soils is unlikely to exceed 600mm depth from earthworm activity, double digging and root depth as stated in "Cover Systems for Land Regeneration" prepared by RSK ENSR Ltd. Therefore, a cover system would require a 600mm layer of clean cover, comprising at least 150mm Topsoil, overlying 450mm of clean subsoil. **This cover system is not required in areas of hardstanding (driveways, paving areas and under the building), where this will break the pathway between contaminated soils and site users.**

During the development, it is recommended that this process of placing the cover layer is tightly monitored and recorded (soil tests, photographs, depth measurements etc) as a verification report will be required to prove its existence to Local Authorities or financing organisations (mortgage companies etc).

6.5 REDUCING THE RISK TO CONSTRUCTION WORKERS

To reduce the risk to as low as reasonably practicable for the construction workers it is recommended that high standards of personal hygiene should be maintained amongst the site personnel at all times. All personnel coming into contact with the soil, ground workers in particular, should be instructed to use gloves when on-site to avoid dermal contact and restrict inadvertent hand-to-mouth ingestion. Washing facilities should be provided for the site staff to use and should be used prior to eating or smoking. Reference should be made to the HSE Document, "Protection of Workers and the General Public during Development of Contaminated Land".

It is also recommended that a watching brief for undiscovered contamination is included in the Works Method Statement. Given the long human history of the site, it is always possible that some previous undiscovered contamination may be encountered. If this is the case, the area should be isolated, and contact be made with a suitably qualified professional for further advice. This is particularly important if the contamination is possibly ACM or liquid-based.

6.6 POST REMEDIATION VERIFICATION

Any remedial measures undertaken at the site will require independent verification once completed to satisfy the relevant regulatory authorities and other interested parties, including future owners of the site, banks, insurers, and mortgage companies. This usually involves a small validation investigation to confirm that the recommended work has been successful.

6.7 RISK TO CONTROLLED WATERS

6.7.1 Preliminary Analysis

The previous investigations undertaken by Hydrock identified the following:

-  *“The Lynch Hill Gravel Member and Lambeth Group are both Secondary A Aquifers, whilst the Seaford Chalk Formation is designated as a Principal Aquifer.*
-  *The are no active licensed surface water or groundwater abstractions within 1km of the site.*
-  *There are no surface water features recorded within 250m of the site.*
-  *The site is not within a Source Protection Zone (SPZ).*
-  *The groundwater body beneath the site (Berkshire Downs Chalk) is currently (2019 Cycle 3) classified under the Water Framework Directive as ‘poor’.”*
-  *Leachate results recorded no exceedances when compared to DWS*

As such, the previous report concluded whilst elevated levels of arsenic and lead in the Made Ground sub base pose a risk to human health on consideration of the thickness of the stratum, that only 1 of 6 samples exceeded, the thickness of the unsaturated zone and the solubility of metals it is unlikely to pose a significant risk to the Chalk aquifer.

This supplementary ground investigation recorded similar findings with 2 out of the 5 ‘Sub-Base’ Made Ground soil recording elevated levels of Arsenic.

Therefore, Geo-Integrity agrees with the findings of the previous investigation undertaken by Hydrock and it is considered there is no significant risk of significant harm to Controlled Waters from the proposed development.

The Environment Agency is the regulatory body charged with the protection of controlled waters and maybe a consultee in the planning process. We recommend that the conclusions of this report are agreed with the relevant Local Authority at the earliest stage, to reduce potential delays to the development.

6.8 RISK TO UNDERGROUND WATER SUPPLY PIPES

Based upon the guidance document from the UK Water Industry Research (UK WIR), 'Contaminated Land Assessment Guidance', February 2014, and the results of the samples specifically tested for a range of hydrocarbons, VOCs and SVOCs, it is considered that conventional PE water pipes will be suitable at this site as no significantly elevated levels were recorded within the 'General' Made Ground and underlying natural soils. However, background levels of hydrocarbons were recorded within the 'Sub-Base' Made Ground, therefore should water pipes pass through this material barrier water pipes should be considered.

This should be confirmed with the local water company as not all authorities use this guidance.

7 WASTE DISPOSAL CLASSIFICATION

7.1 INTRODUCTION

Excavation for foundations or services will produce waste soil and possibly other waste streams. As a waste producer, you have a duty of care under section 34 of the Environmental Protection Act 1990 to ensure, amongst other things that these wastes are:-

-  Correctly stored
-  Correctly classify
-  Handed only to an authorised person
-  Disposed of properly.

To aid with these obligations we have used HazWasteOnline to undertake the Hazard Assessment Screen as part of this investigation, to establish whether the sampled soils should be considered as either hazardous or non-hazardous waste. This classification process is in line with the Environment Agency's guidance WM3 "Guidance on the classification and assessment of waste", Version 1.2, 2021.

The previous investigation (Report ref:26887-HYD-XX-XX-RP-GE-1001, dated 30th May 2023) undertook a preliminary waste classification assessment including a HazWasteOnline assessment and additional WAC testing on the 'General' Made Ground soils. The 'General' Made Ground was classified as non-hazardous waste based on the HazWasteOnline analysis and the WAC testing proved it can also be accepted at an 'inert' landfill. The 'Sub-Base' Made Ground was classified as non-hazardous waste, subject to confirmation by WAC testing.

It was also stated by the previous investigation bituminous bound pavement is present at the site, however no testing was undertaken to confirm it is hazardous or non-hazardous for off-site disposal.

As such, the final objective of this report was to undertake additional testing of 'Sub-Base' Made Ground soils including WAC testing and blacktop testing to aid with waste classification.

7.2 RESULTS OF HAZARD ASSESSMENT

The five 'Sub-Base' Made Ground samples analysed for the human health risk assessment, listed in section 6.2, have been classified using HazWasteOnline.

The full results of the HazWasteOnline analyses can be seen in the Appendices.

The HazWasteOnline classification summary sheet from this investigation provides a waste classification of non-hazardous waste for all 'Sub-Base' Made Ground soil samples.

Blacktop testing was undertaken on two representative samples and recorded benzo(a)pyrene at below detectable limits therefore it is unlikely the blacktop on-site is coal tar derived. Thus, the blacktop should be classified as non-hazardous.

7.2.1 Waste Acceptance Criteria (WAC) Testing Results

To further classify the 'Sub-Base' Made Ground for landfill disposal, Waste Acceptance Criteria (WAC) testing has been carried out on a representative sample taken from HA1 at a depth of 0.20m bgl. This second stage of classification is used to determine whether the material is suitable to be disposed at an inert landfill.

The results show that sample does not pass the inert landfill criteria due to elevated mineral oil (>C10 to C40) which was recorded at 1100mg/kg with the limit value being 500mg/kg. As such, the 'Sub-Base' Made Ground should be classified as non-hazardous waste in a non-hazardous landfill

Additionally, it is considered that the underlying natural soils beneath the site qualify in accordance with EU Council Decision 2003/33/EC para. 2.1.1. "Uncontaminated soil can be classified as inert without testing".

As such, given the testing results, currently, the underlying soils from the site are considered to be classified as follows: -

Strata	Description of Material	Classification	List of Waste code	Recommended Landfill Tax Rate
Blacktop	Bituminous mixtures other than those mentioned in 17 03 01	Non-Hazardous	17 03 02	Standard Rate
'Sub-Base' Made Ground	Naturally occurring soils and stones with man-made materials including fragments of brick, flint and slate	Non-Hazardous	17 05 04	Standard Rate
Classifications from the previous investigation (Report ref:26887-HYD-XX-XX-RP-GE-1001, dated 30th May 2023)				
'General' Made Ground	Soil and stones containing man-made materials including fragments brick and concrete	Inert	17 05 04	Lower Rate
Natural Soil	Naturally occurring soils and stones (subsoil)	Inert	17 05 04	Lower Rate

All wastes removed from the site should be consigned, transported and disposed of in full accordance with all relevant UK legislation.

7.3 RE-USE OF MATERIAL ON SITE

Currently, if surplus arisings are 'fit for re-use' on the site and have not been treated, its re-use is allowed within the planning law. If it needs treating prior to re-use, exemptions can be sought from the Environment Agency to allow this activity.

Based upon the human health and groundwater risk assessments, the underlying 'Sub-Base' Made Ground soil is currently considered to be unsuitable for re-use in a residential land-use scenario. However, the 'General' Made Ground soils and underlying clean natural soils are considered suitable for re-use on a residential site. This analysis is, however, dependent on the agreement of the Local Authority.

8 RECOMMENDATIONS

8.1.1 *Watching Brief*

We recommend a watching brief should be undertaken during the construction phase, and if during development any previously undiscovered contamination (including visual or olfactory evidence) is found then site management should be immediately informed and inspection by a suitably qualified person should be undertaken.

8.1.2 *Geotechnical*

The dynamic probes assessment identified two anomalies within DP114 and DP122 displaying significant zones of weakness which could indicate potential dissolution features or worked ground associated with historical mining. **It would be expected to delineate the zones of weakness utilising both boreholes and dynamic probes with the samples collected from the boreholes providing clearer indication of the nature of the material associated with the identified zones of weakness. Should further investigation prove the presence of dissolution features or worked/infilled ground associated with historic mining alternative foundations may be required or further consideration made to reinforced foundations capable of bridging voids which might develop anywhere beneath the structure.**

Additional dynamic probes will also be undertaken post-demolition to cover the remaining footprint of the proposed residential dwellings. The results will be amended to this report.

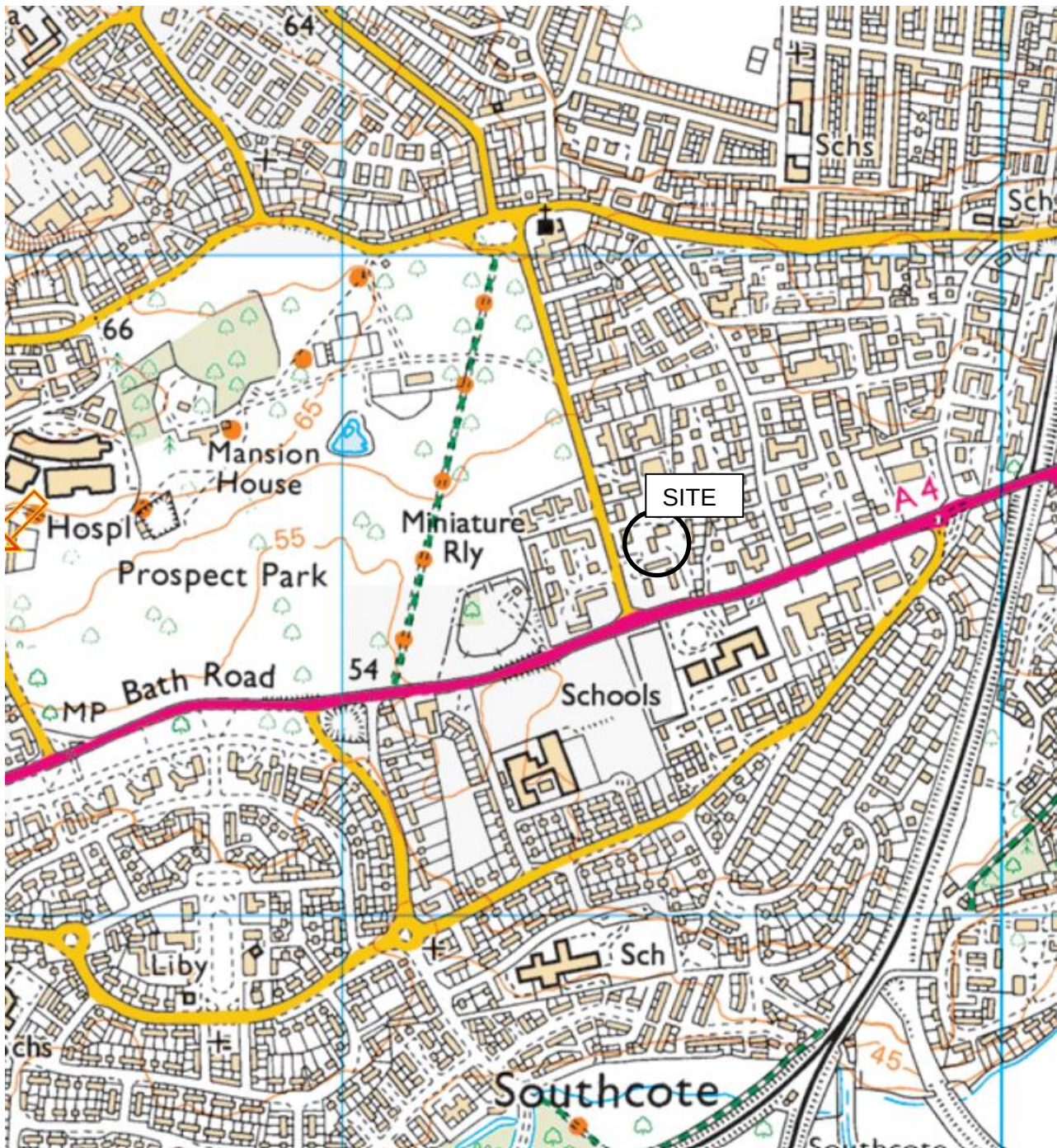
8.1.3 *Geo-Environmental*

Additional sampling and testing of 'Sub-Base' Made Ground soils has confirmed this material is impacted by heavy metals and PAHs. Therefore, further zoning of this material is not considered appropriate. It is considered mitigation measures will be required in proposed soft landscaping areas underlying 'Sub-Base' Made Ground, see section 6.4 for full details. Any remedial measures undertaken at the site will require independent verification once completed to satisfy the relevant regulatory authorities and other interested parties, including future owners of the site, banks, insurers, and mortgage companies. This usually involves a small validation investigation to confirm that the recommended work has been successful.

REFERENCES

- Building Research Establishment (BRE) BR 211, Radon: guidance on protective measures for new buildings. 2007.
- National House Building Council (NHBC) Standards, Chapter 4.2 Building Near Trees. 2011.
- National House Building Council (NHBC) Standards, Chapter 4.1 Land Quality – Managing Ground Conditions. 2011.
- Environment Agency, ‘Land contamination: risk management’, LCRM, 2019.
- Health and Safety Executive (HSE), “Protection of Workers and the General Public during Development of Contaminated Land” HS(G) 66. HMSO London 1991.
- Environment Agency, ‘Human Health Toxicological Assessment of Contaminants in Soil’, September 2008.
- BGS Geology of Britain Viewer: 2016. www.bgs.ac.uk. British Geological Survey.
- BRE Special Digest 1: 2005 : Concrete in aggressive ground. Building Research Establishment.
- BS 1377: 1990 : Methods of test for soils for civil engineering purposes. British Standards Institution.
- BS 5930: 2015 : Code of practice for ground investigations. British Standards Institution.
- BS EN 1997-2: 2007 : Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing. British Standards Institution.
- BS EN ISO 14688-1:2002+A1: 2013 : Geotechnical investigation and testing - Identification and classification of soil - Part 1 Identification and description. British Standards Institution.
- BS EN ISO 14688-2:2004+A1: 2013: Geotechnical investigation and testing - Identification and classification of soil - Part 2 Principles for a classification. British Standards Institution. Investigation of Potentially Contaminated Sites – Code of Practice, BS10175, 2011.
- Environment Agency, “Waste Sampling and Testing for Disposal to Landfill” March 2013
- G Card and S Wilson, An Alternative Approach for Ground Gas Risk Assessment, 2011.

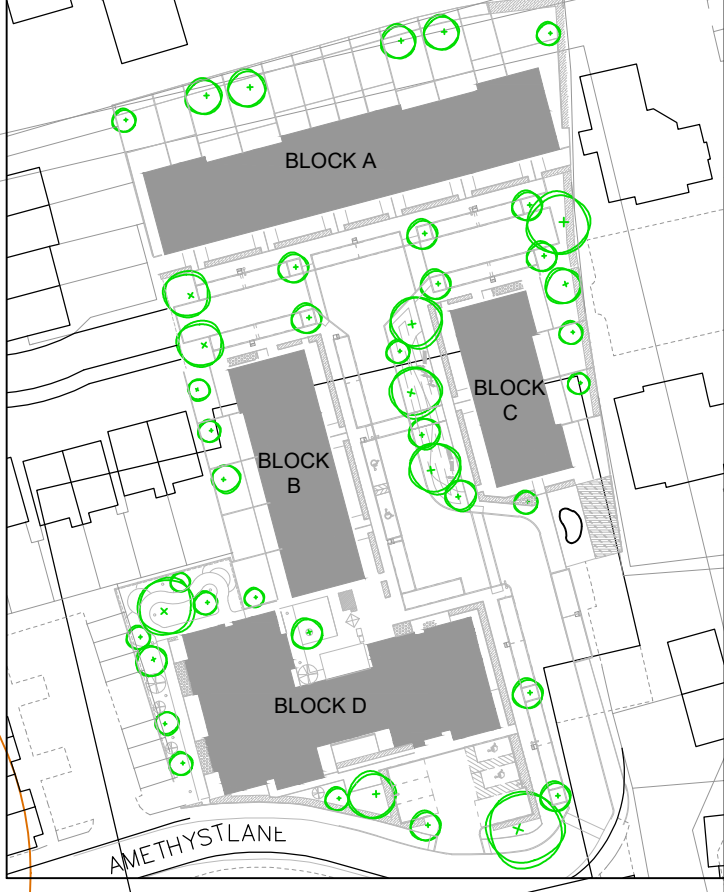
APPENDIX A



August 2024

SITE LOCATION PLAN

Report No:- 24-06-13



Do not scale from drawings unless by agreement with HTA. Use figured dimensions only. Check all dimensions on site prior to commencing the works. Drawing to be read in conjunction with other relevant consultant information.

This drawing is the copyright of HTA Design LLP and must not be copied or reproduced in part, or in whole, without the express permission of HTA Design LLP. Drawing to be read in conjunction with specification.

This Tender drawing, together with HTA's other Tender drawings and Outline Specification, describes HTA Design LLP's concept design intent to be achieved by the Design and Build Contractor and any construction proposals shown herein are indicative only. The detailed design resolution and specification of the construction shall be carried out by the Design and Build Contractor and/or their appointed design consultants and/or specialist subcontractors to achieve the design intent and shall comply with the Employer's Requirements, the CDM Regulations 2015 and any other relevant health and safety legislation, and the requirements of the Building Regulations.

- Drawings to be read in conjunction with all relevant consultants' documentation.
- Structural information is indicative, shown for coordination only - Refer to Hydrock Structural Engineer's drawings and specification.
 - Service information is indicative, shown for coordination only - Refer to Hydrock MEPH Consultant drawings and specification.
 - For fire resistance rating requirements refer to Fire Strategy report by Fire Engineers.
 - Refer to Hydrock's drawings and specification for lighting information.
 - For acoustic criteria refer to Acoustician's report.
 - All drawings to be read in conjunction with HTA specification and relevant schedules.
 - Ceiling bulkheads to be avoided where possible, but may be required in some instances where SVP's offset. To be reviewed at detailed design stage.

REFER TO DRAWINGS	
PROPOSED SITE PLANS:	1100-1118
GA PLANS:	2000-2016
GA ELEVATIONS:	2100-2110

LEGEND:	
	Site Boundary
	Tree (Existing)
	RPA (Root Protection Area)
	Tree (Proposed)
	Proposed Ground Floor FFL
	Proposed External Site FFL
	Proposed Building Entrance
	Active Car Charging Space
	Structural Grid
	Grid Dimension

Note: Site levels to be coordinated with Hydrock civils design at Stage 4

B	28.07.23	KDU	Stage 3B Issue
A	17.07.23	KDU	Issued for information
Rev	23.06.23	ALA	Issued for information
Date			
Drawn			
Description			
Status			

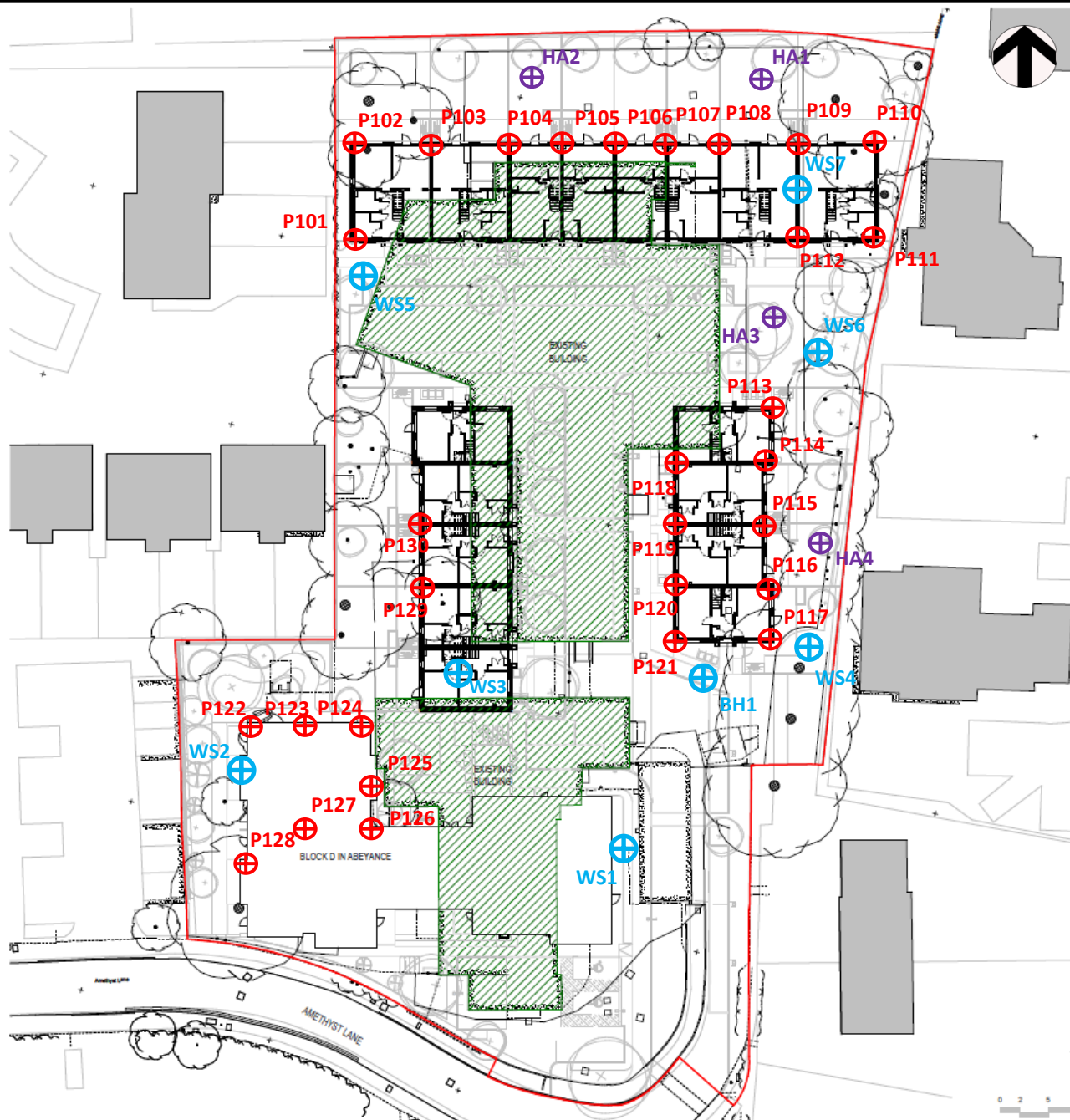
FOR TENDER

client / project
Reading Borough Council
Amethyst Lane (Stage 3B)

drawing title
Proposed Site Plan

drawing number	revision
HTA-A DR_1100	B
scale @ A1	originated by
1:200	ALA
HTA Design LLP	project code
www.hta.co.uk	RBC-ALR

London | Edinburgh | Manchester | Bristol



Key

- ⊕ Dynamic Probes
- ⊕ Hand Auger Pits
- ⊕ Previous Boreholes (Soils Ltd.)



4 Church Street
Maids Moreton
MK18 1QE

Tel:- 01280 816409
Mob:- 07858 367 125
www. geo-integrity.co.uk

Exploratory Hole Location Plan

**SITE:- Amethyst Lane,
Reading**

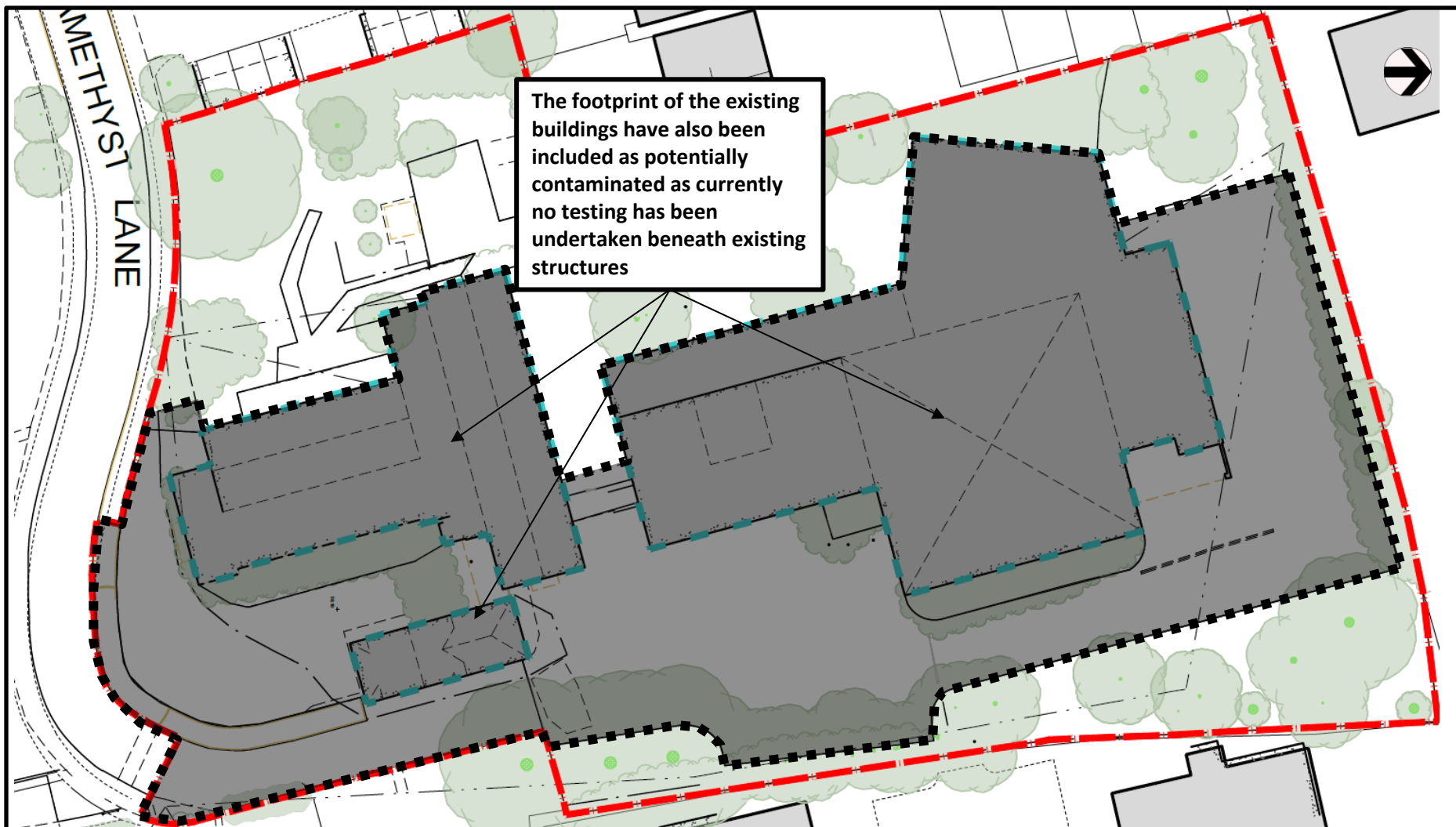
JOB NO.:- 24-06-13

CLIENT:- Helix Ltd

**Drawn
LA**

**Checked
DL**

**Scale: Not To Scale, for
indicative purposes only**



Key



Zoned area of contaminated
'Sub-Base' Made
Ground

**Zoned Area of
Contaminated Made
Ground – Existing Plan**

JOB NO.:-24-06-13

Tel:- 01280 816409
Mob:- 07858 367 125
[www. geo-integrity.co.uk](http://www.geo-integrity.co.uk)

**SITE:- Amethyst Lane,
Reading, RG30 2EZ**

CLIENT:- Helix Ltd

4 Church Street
Maids Moreton
MK18 1QE

**Drawn
LA**

**Checked
MB**

**Scale: Not To Scale, for
indicative purposes only**



INTEGRITY



Hand-dug trial pit ('Sub-Base' Made Ground)



Hand-dug trial pit ('Sub-Base' Made Ground)

August 2024

SITE PHOTOGRAPHS

24-06-13



Hand-dug trial pit ('Sub-Base' Made Ground)



Hand-dug trial pit ('Sub-Base' Made Ground)

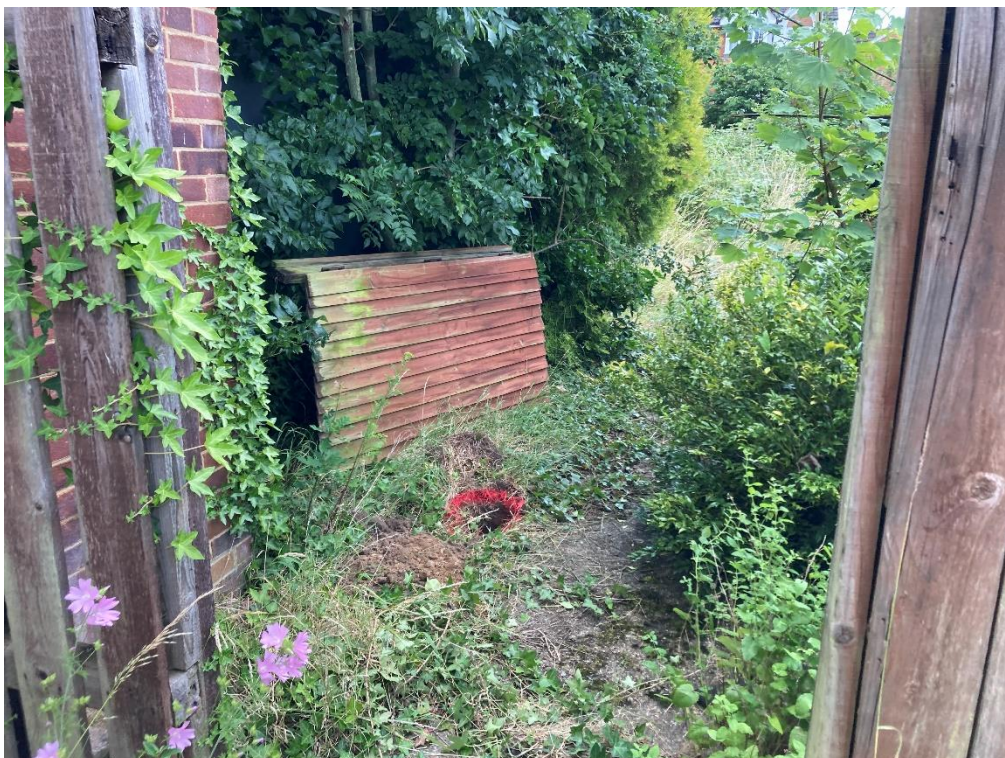
August 2024

SITE PHOTOGRAPHS

24-06-13



Dynamic Probes



Dynamic Probes

APPENDIX B



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Amethyst Lane, Reading, RG30 2EZ

**Trial Pit
Number**
HA1

Method : Hand Auger

Ground Level (mOD)

Helix

Job Number
24-06-13

Dates

08/07/2024-
11/07/2024

Lee Ashworth

Sheet
1/1

Sample / Tests

Field Records

Depth
(m)
(Thickness)

Description

Legend

Water

D

0.50

D

(0.10)

0.10

(0.25)

0.35

(0.15)

0.50

TARMAC

'SUB-BASE' MADE GROUND - (Medium dense) grey slightly silty slightly sandy GRAVEL. Gravel is fine to coarse subangular limestone and slate

'SUB-BASE' MADE GROUND - Loose light brown clayey gravelly SILT. Gravel is fine to coarse flint and brick

Refused on brick at 0.50m - Possible historic footing

Complete at 0.50m

Plan

Remarks

Scale (approx)

1:5

Logged By

HF

Figure No.

24-06-13.HA1

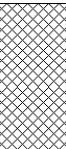
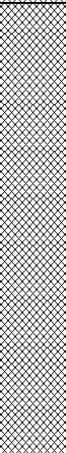


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Site
Amethyst Lane, Reading, RG30 2EZ

Trial Pit
Number
HA2

Machine : Hand Dug Method : Hand Auger	Dimensions	Ground Level (mOD)	Client Helix	Job Number 24-06-13
	Location 469464 E 172702 N	Dates 08/07/2024-11/07/2024	Engineer Lee Ashworth	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	D					TARMAC		
					(0.10)			
					0.10	'SUB-BASE' MADE GROUND - (Medium Dense) grey very silty sandy GRAVEL. Gravel is fine to coarse subangular limestone and flint		
					(0.30)			
					0.40	LYNCH HILL GRAVEL MEMBER (Medium dense) orange brown clayey silty sandy GRAVEL. Gravel is fine to coarse subangular flint		
0.75	D				(0.35)			
					0.75	Complete at 0.75m		

Plan	.	.	.	.	.	.	.	.	.	.	Remarks
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	.	.	.	.	.	.	.	.	.	.	Scale (approx) 1:5 Logged By HF Figure No. 24-06-13.HA2



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01280 816409

Site
Amethyst Lane, Reading, RG30 2EZ

Trial Pit
Number
HA3

Machine : Hand Dug Method : Hand Auger		Dimensions	Ground Level (mOD)	Client Helix	Job Number 24-06-13
		Location (dGPS) 469494 E 172684 N	Dates 08/07/2024- 11/07/2024	Engineer Lee Ashworth	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	D				(0.05)	TARMAC		
					0.05	'SUB-BASE' MADE GROUND - (Medium Dense) grey brown slightly silty slightly sandy GRAVEL. Gravel is coarse subangular limestone		
					(0.45)			
0.30	D							
					0.50	'SUB-BASE' MADE GROUND - Loose brown slightly clayey slightly sandy silty GRAVEL. Gravel is fine to coarse subangular limestone and brick		
					(0.25)			
0.75	D				0.75	Complete at 0.75m		

Plan					Remarks			
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					Scale (approx)	Logged By	Figure No.	
					1:5	HF	24-06-13.HA3	



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info@geo-integrity.co.uk
01280 816409

Site
Amethyst Lane, Reading, RG30 2EZ

Trial Pit
Number
HA4

Machine : Hand Dug Method : Hand Auger		Dimensions	Ground Level (mOD)	Client Helix	Job Number 24-06-13
		Location 469499 E 172659 N	Dates 08/07/2024- 11/07/2024	Engineer Lee Ashworth	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	D				(0.10)	TARMAC		
					0.10	'SUB-BASE' MADE GROUND - (Medium dense) grey brown very sandy GRAVEL. Gravel is fine to coarse subangular limestone		
0.50	D				(0.50)			
					0.60	LYNCH HILL GRAVEL MEMBER Loose orange brown slightly gravelly SAND. Gravel is fine to coarse subangular flint		
					(0.15)			
					0.75	Complete at 0.75m		

Plan					Remarks			
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					Scale (approx)	Logged By	Figure No.	
					1:5	HF	24-06-13.HA4	

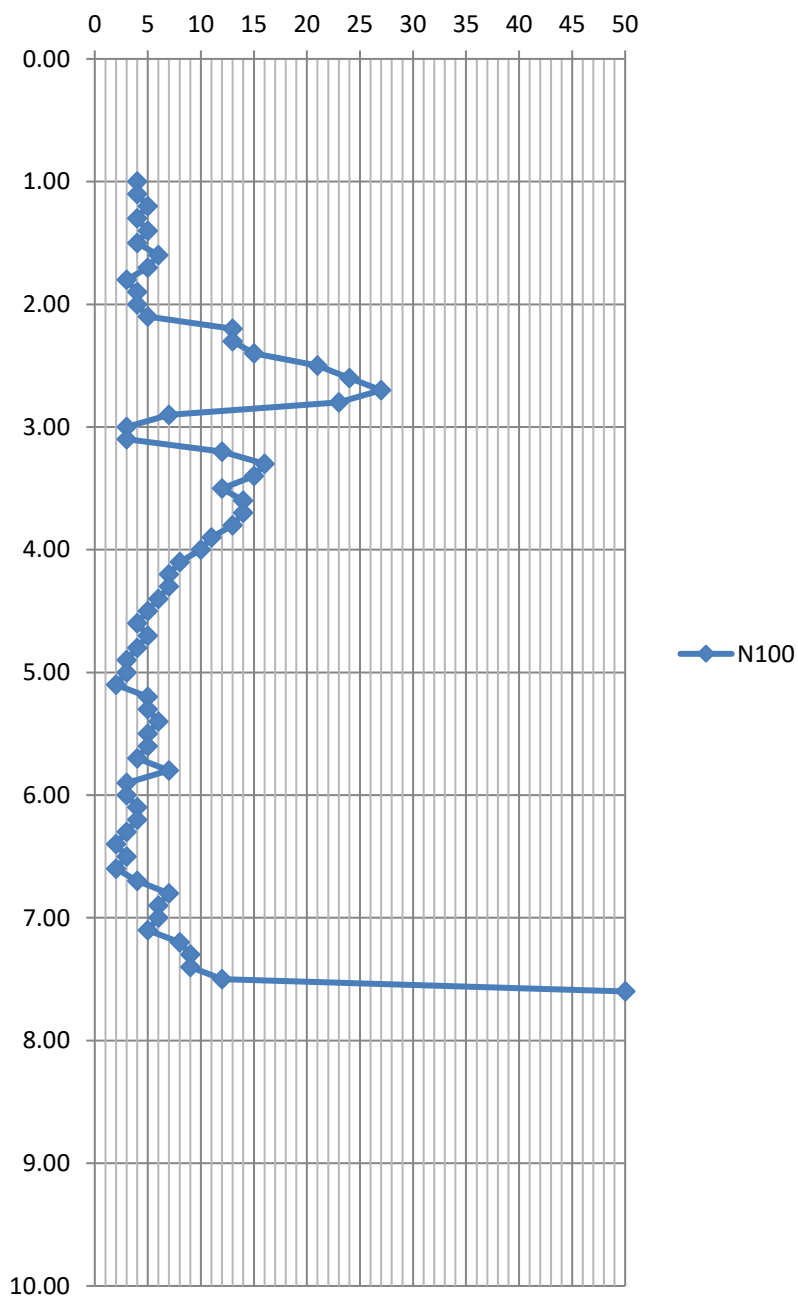


SUPER HEAVY DYNAMIC PROBE - DP101

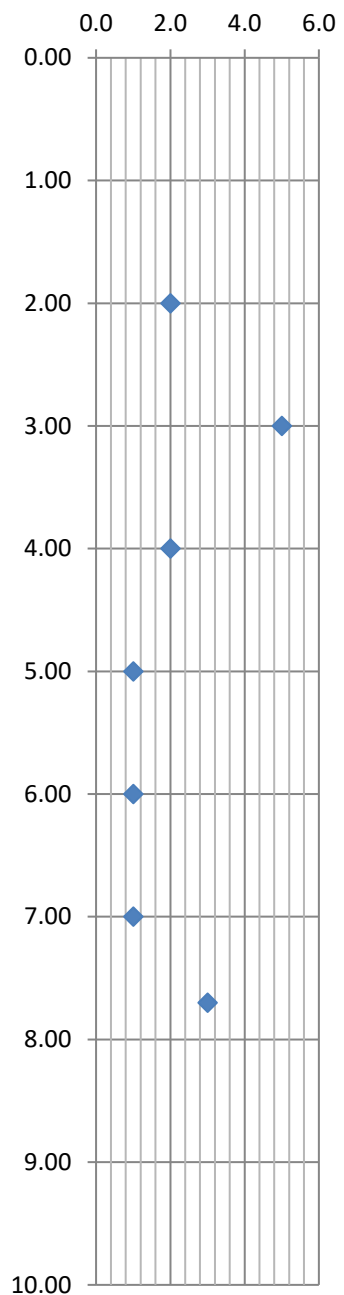
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 08/07/2024

EASTINGS 469449.96
NORTHINGS 469448.33
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



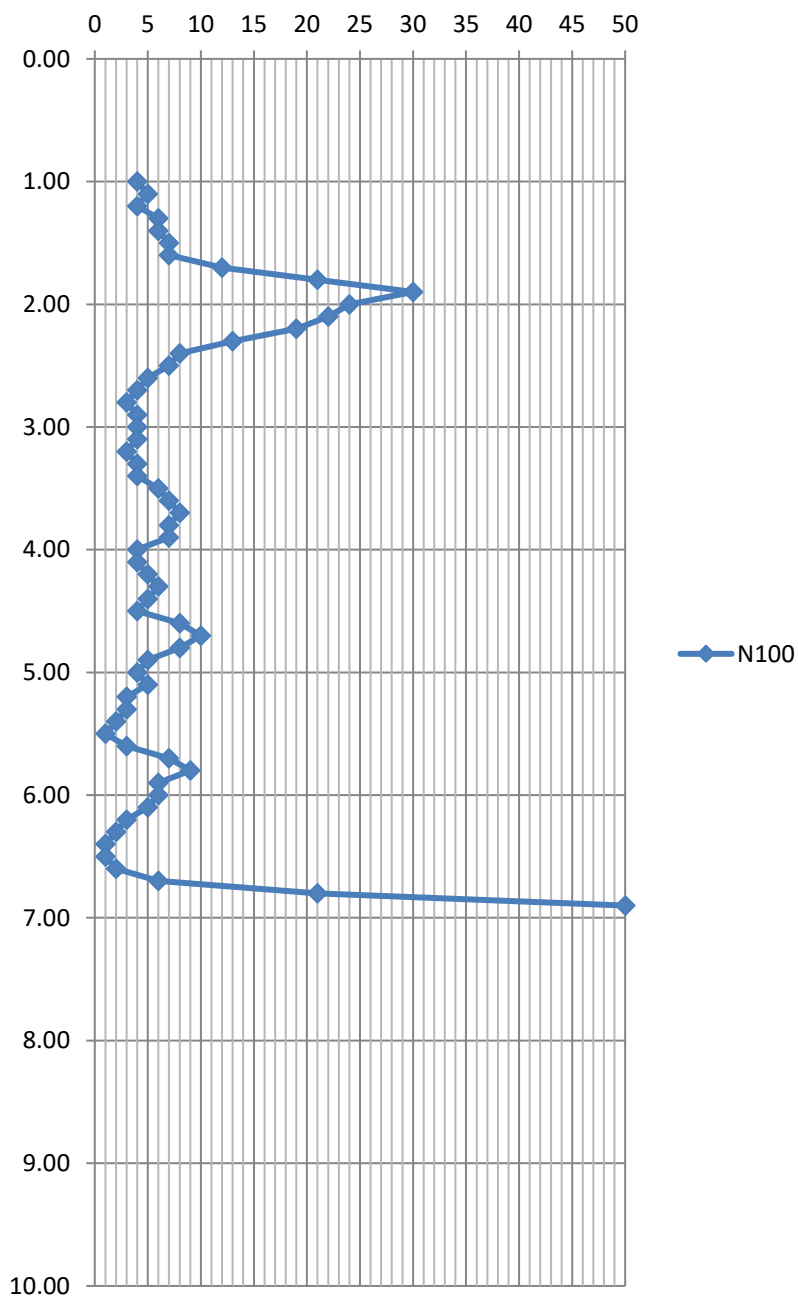
INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground



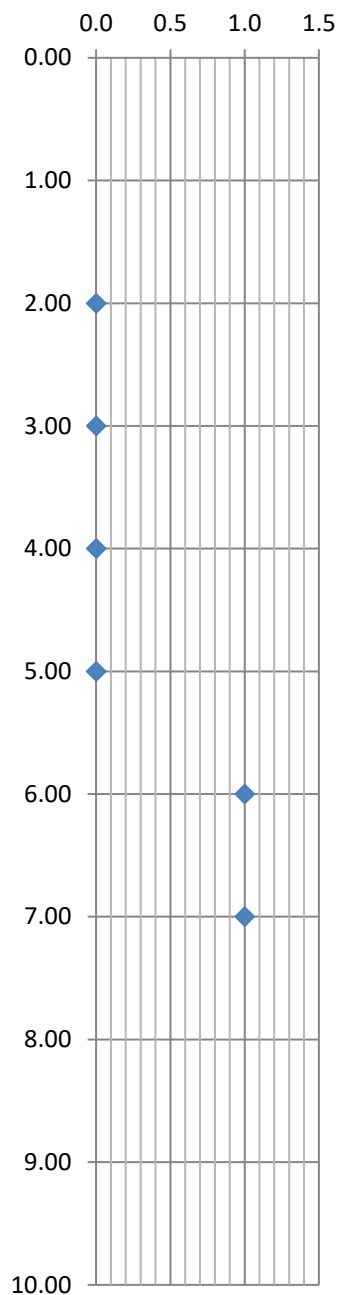
SUPER HEAVY DYNAMIC PROBE - DP102

PROJECT NUMBER	,24-06-13	EASTINGS	469448.33
PROJECT NAME	Amethyst Lane, Reading	NORTHINGS	172692.33
CLIENT	Helix Ltd.	HAMMER WEIGHT	63.5KG
DRILLING DATE	08/07/2024	HAMMER DROP	0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

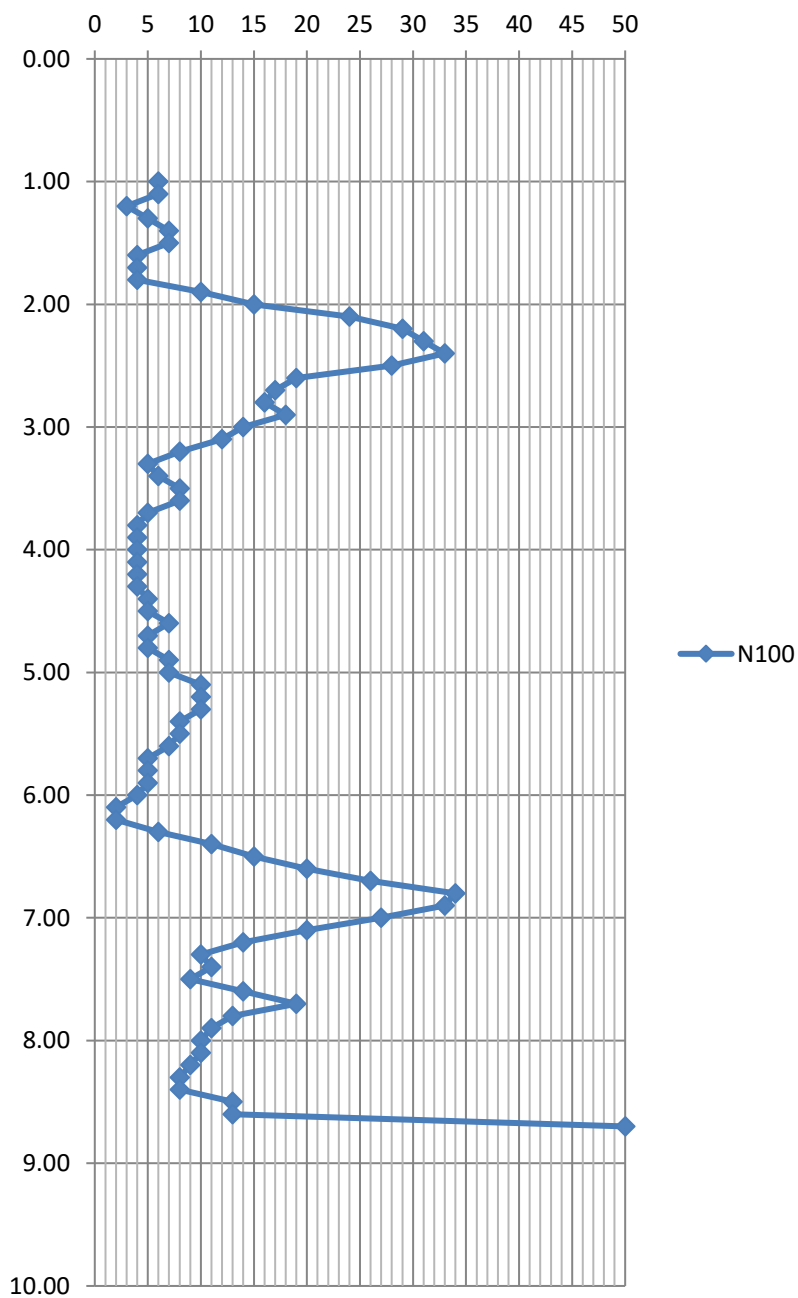


SUPER HEAVY DYNAMIC PROBE - DP103

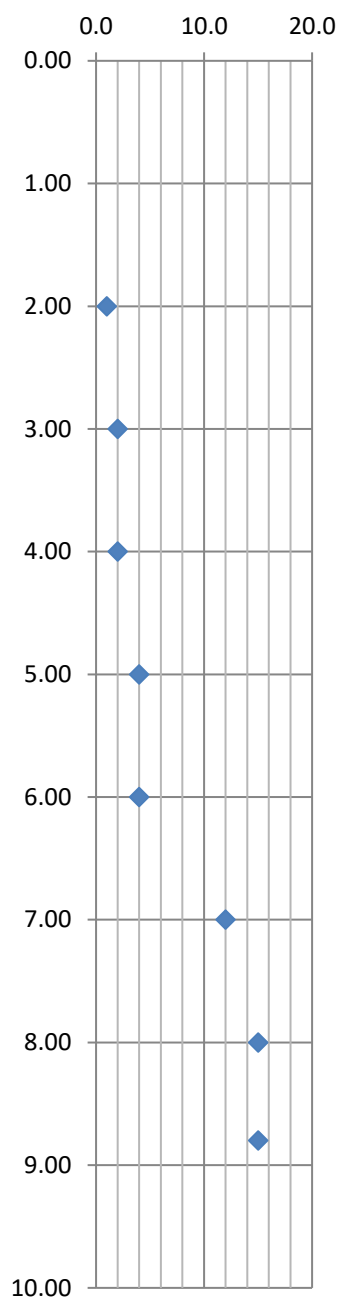
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 08/07/2024

EASTINGS 469455.07
NORTHINGS 172692.93
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



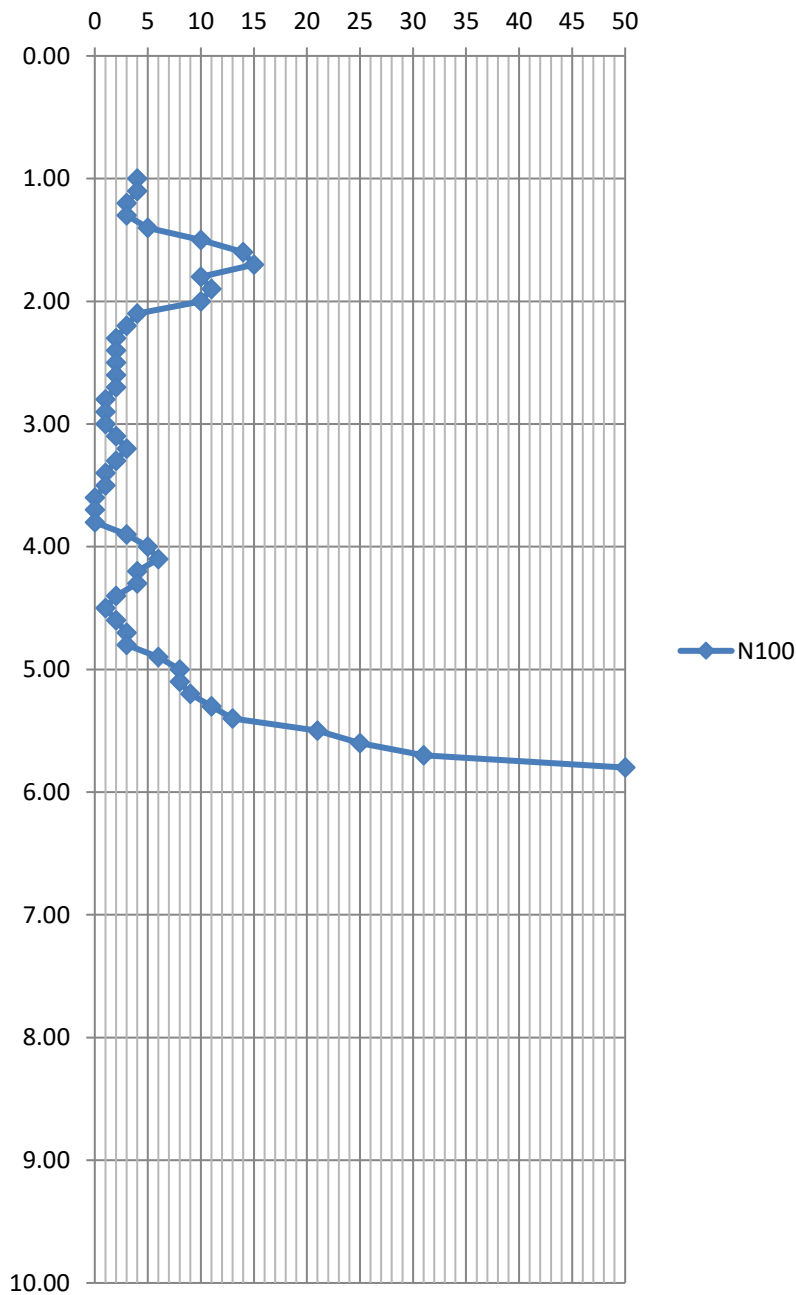
INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground



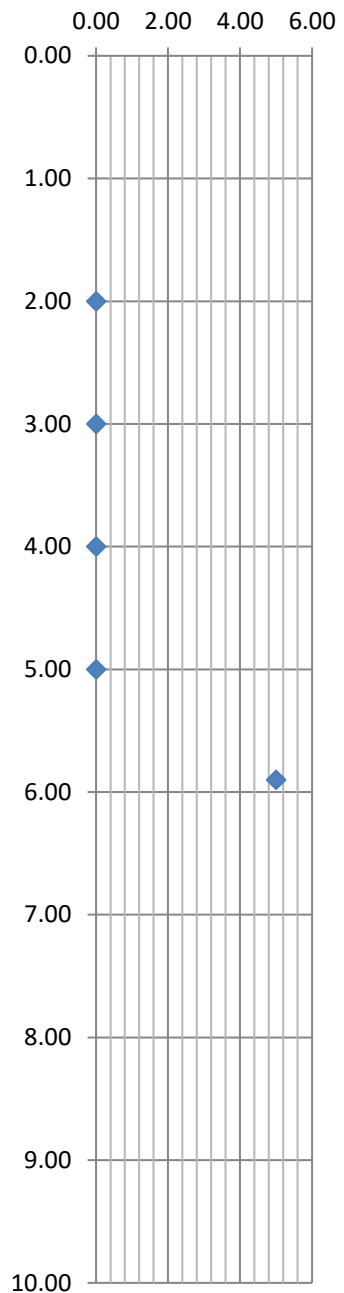
SUPER HEAVY DYNAMIC PROBE - DP104

PROJECT NUMBER	,24-06-13	EASTINGS	469457.79
PROJECT NAME	Amethyst Lane, Reading	NORTHINGS	172697.06
CLIENT	Helix Ltd.	HAMMER WEIGHT	63.5KG
DRILLING DATE	08/07/2024	HAMMER DROP	0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

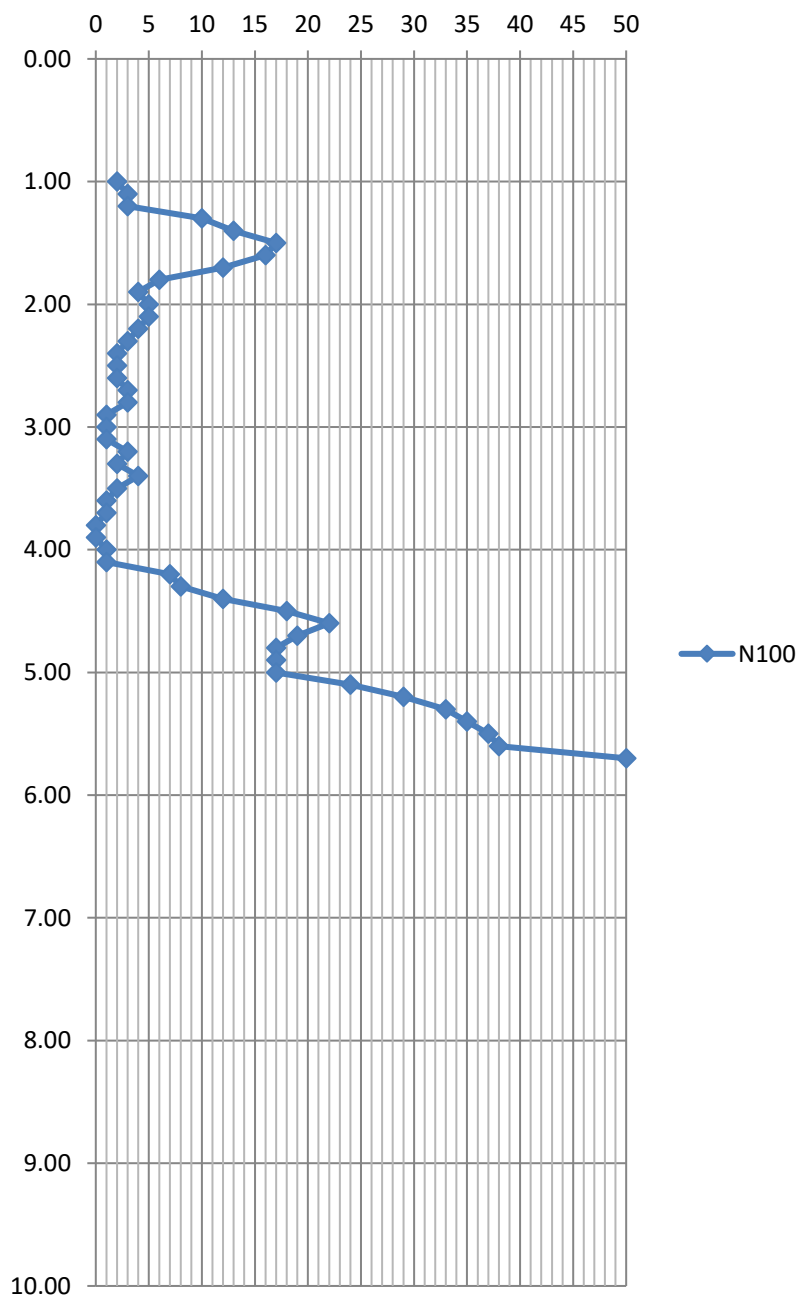


SUPER HEAVY DYNAMIC PROBE - DP105

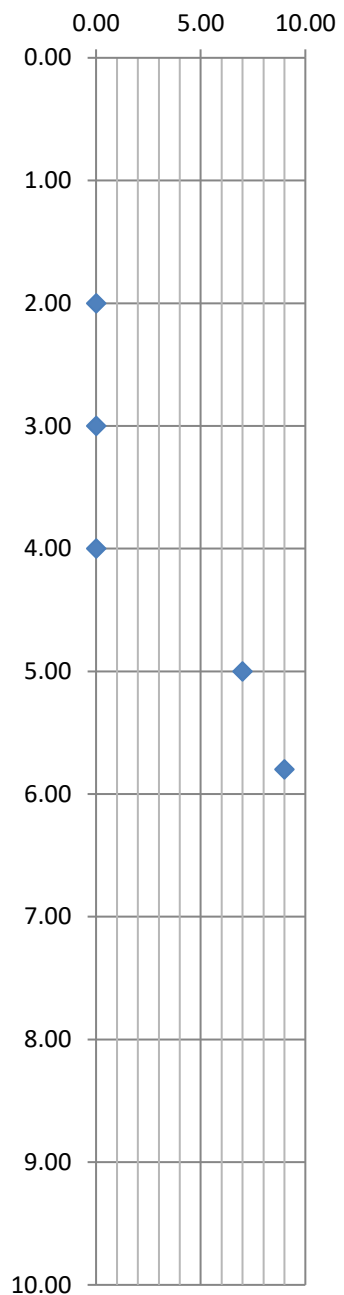
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 08/07/2024

EASTINGS 469463.76
NORTHINGS 172696.37
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

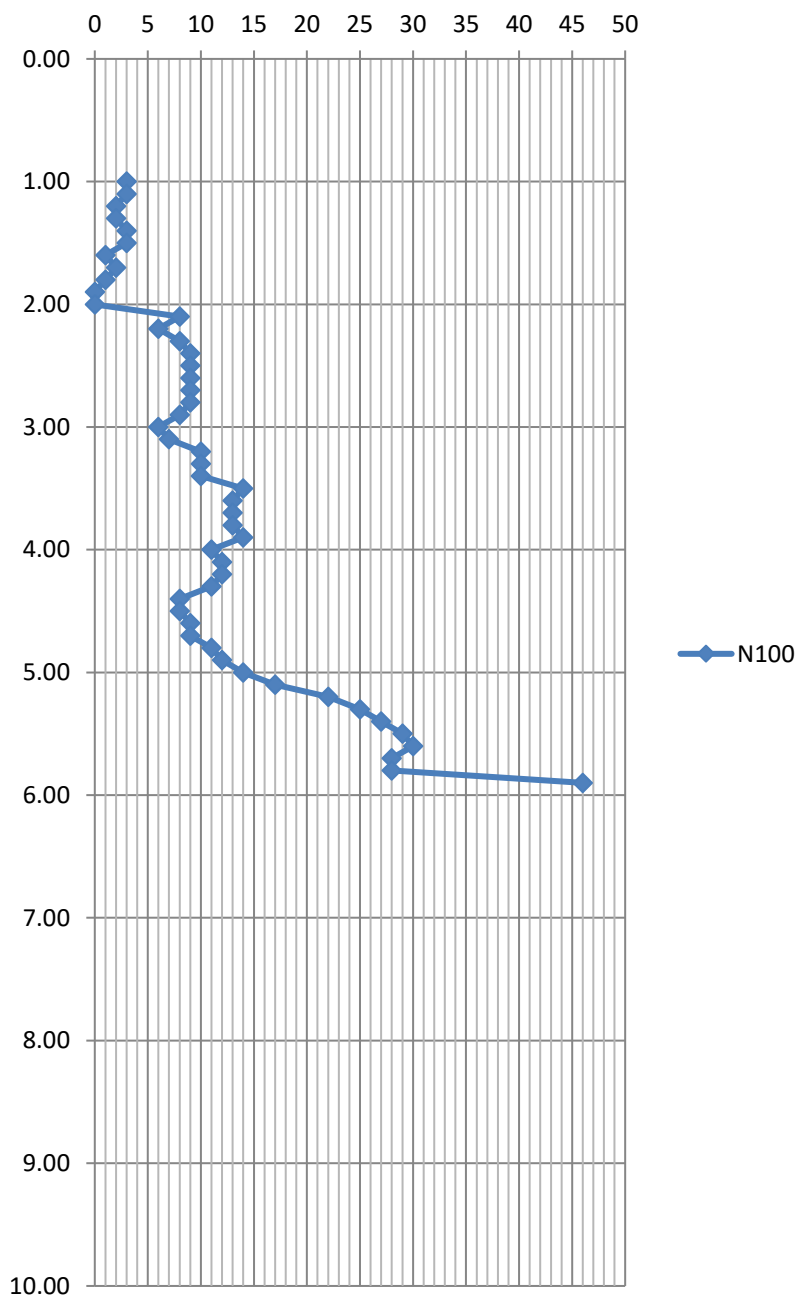


SUPER HEAVY DYNAMIC PROBE - DP106

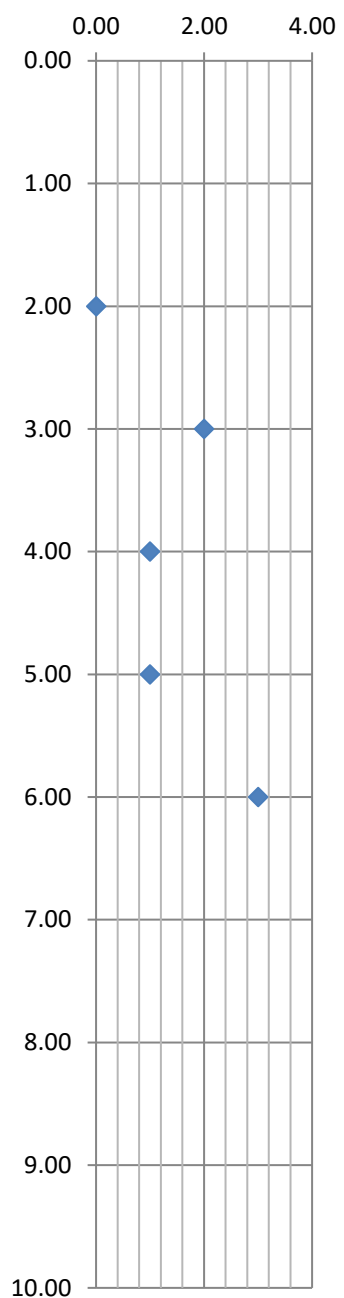
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 08/07/2024

EASTINGS 469469.38
NORTHINGS 172697.77
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



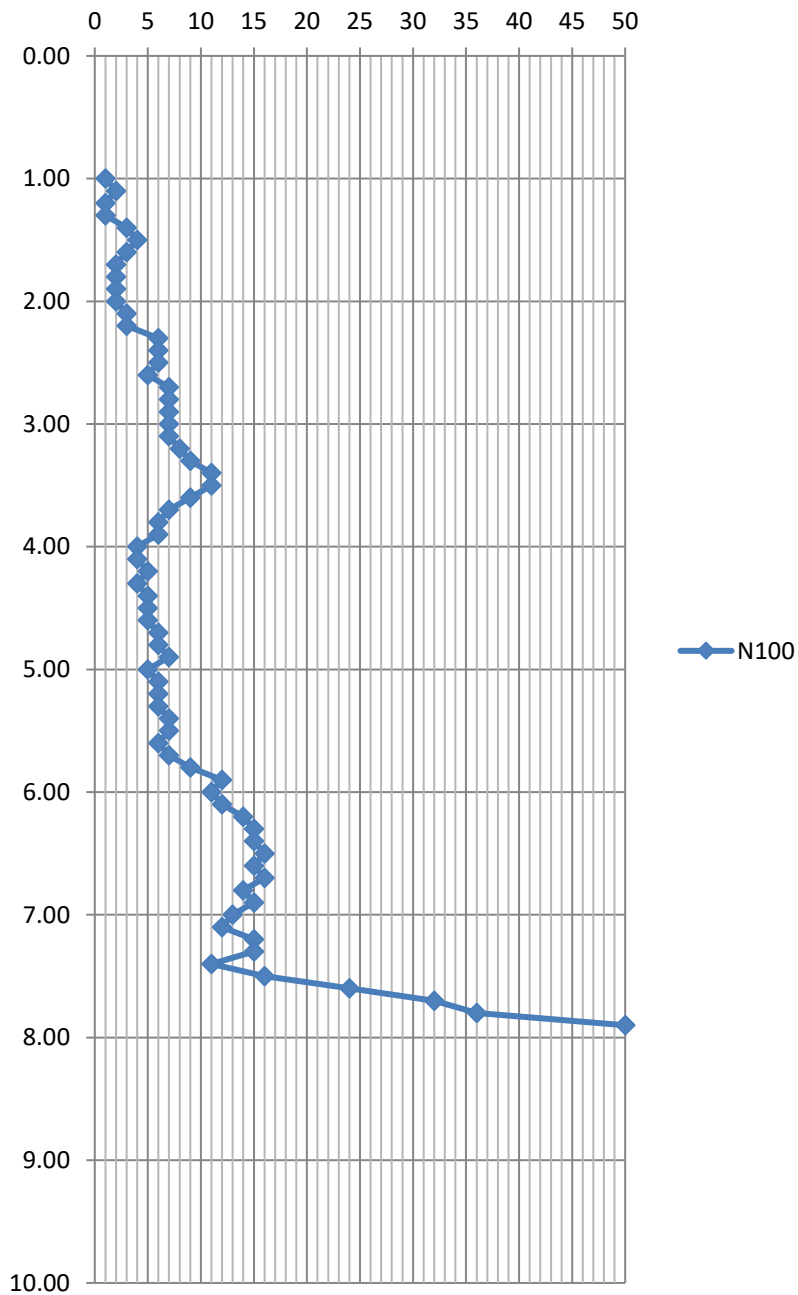
INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground



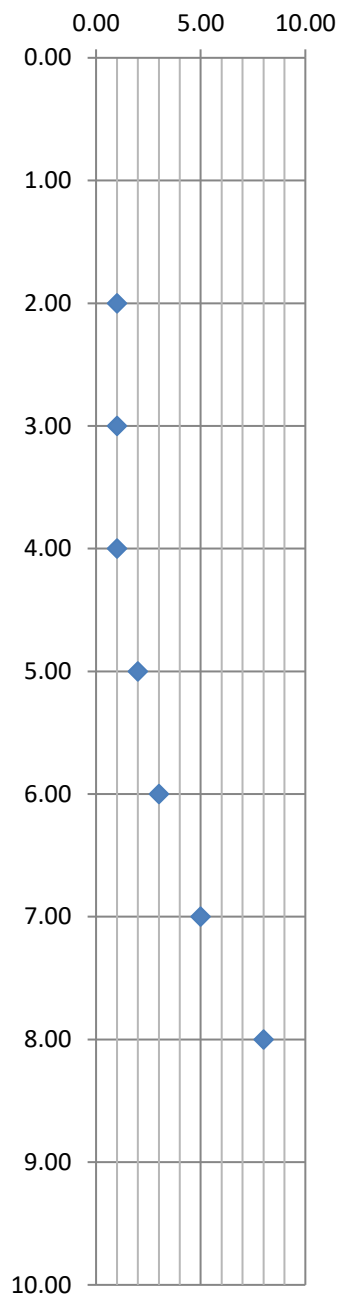
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PROJECT NAME	Amethyst Lane, Reading	NORTHINGS	172699.6
CLIENT	Helix Ltd.	HAMMER WEIGHT	63.5KG
DRILLING DATE	08/07/2024	HAMMER DROP	0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

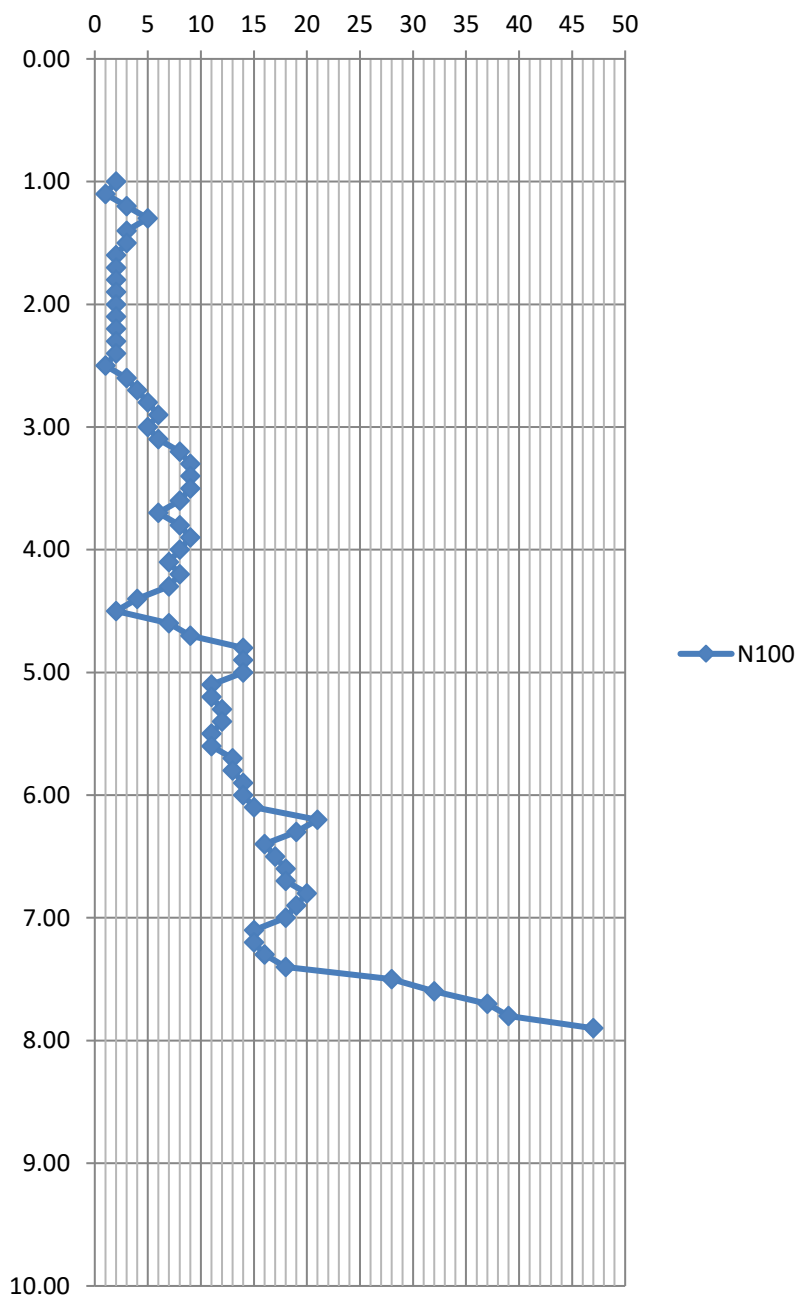


SUPER HEAVY DYNAMIC PROBE - DP108

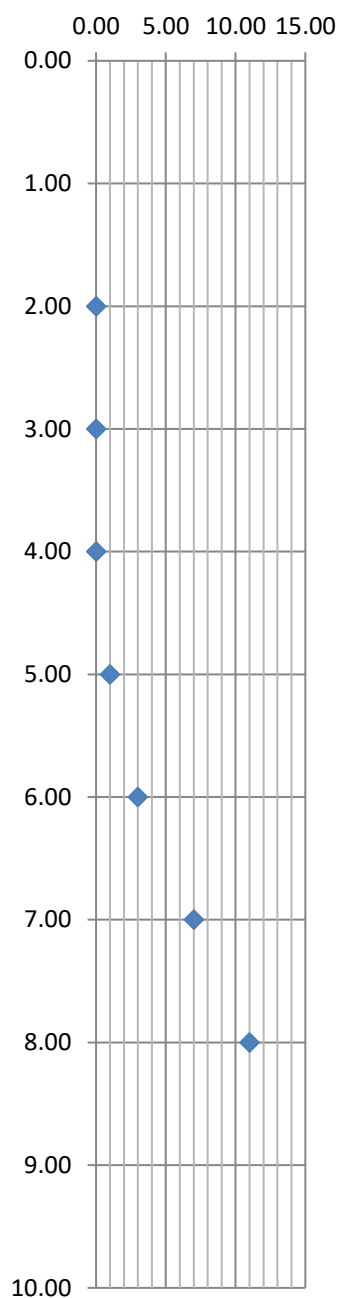
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 08/07/2024

EASTINGS 469475.93
NORTHINGS 172699.56
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

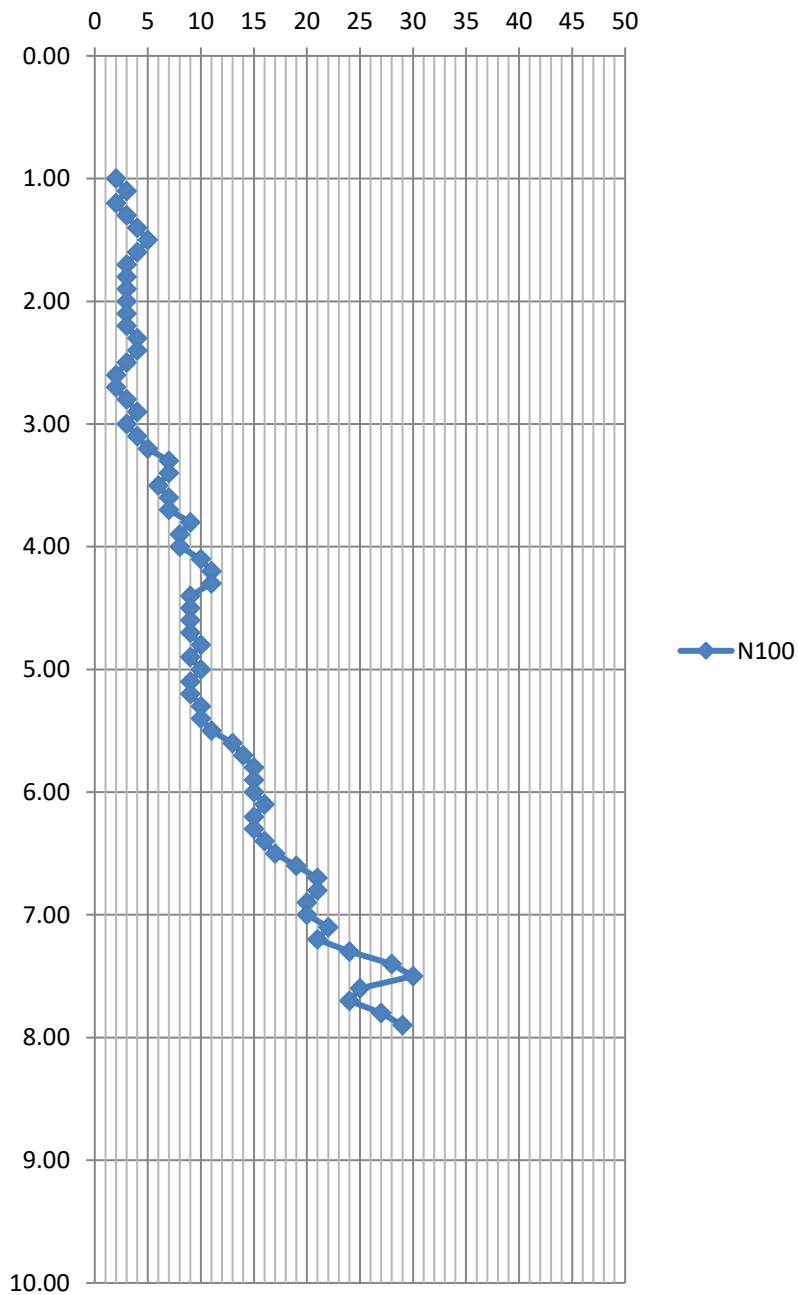


SUPER HEAVY DYNAMIC PROBE - DP109

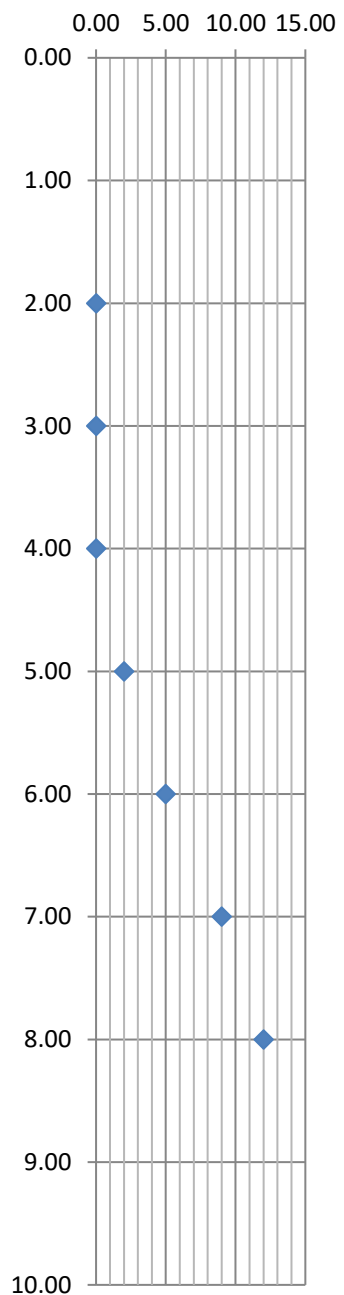
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 09/07/2024

EASTINGS 469475.93
NORTHINGS 172699.56
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

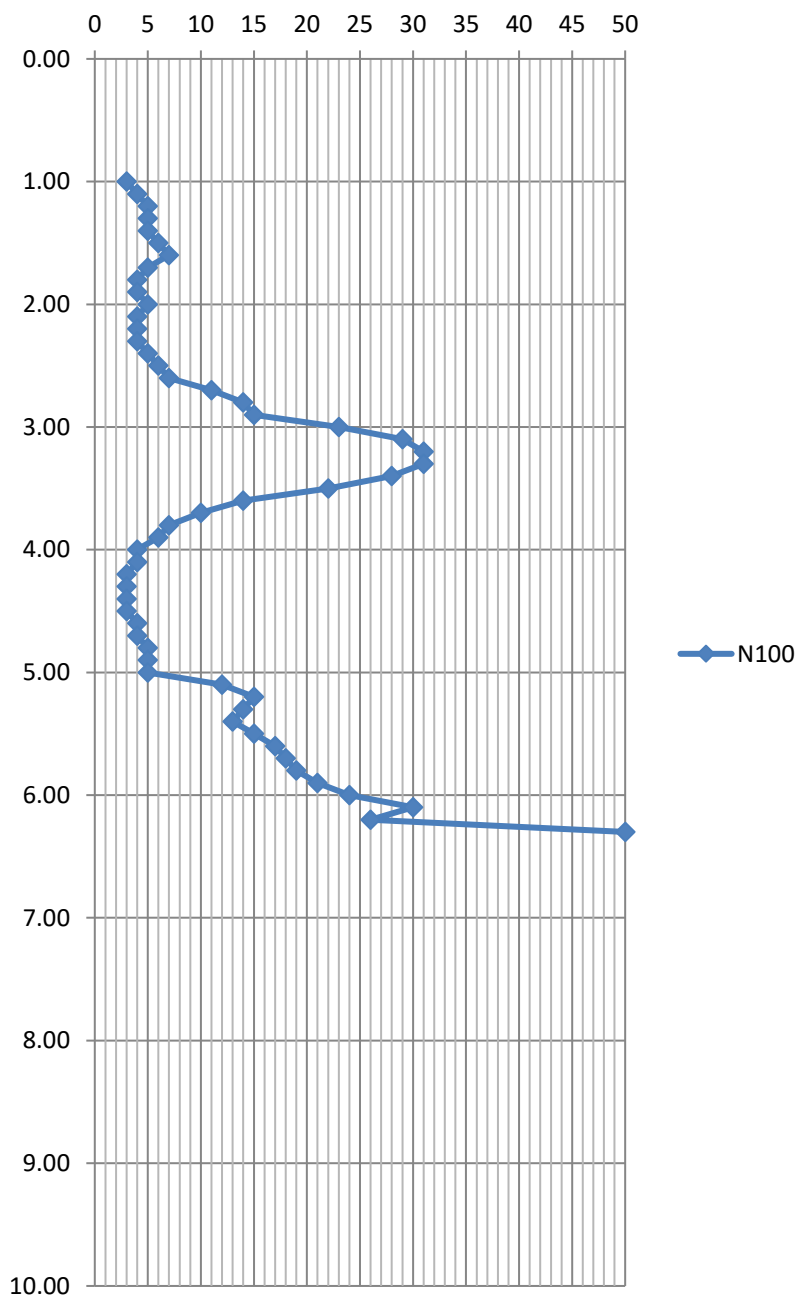


SUPER HEAVY DYNAMIC PROBE - DP110

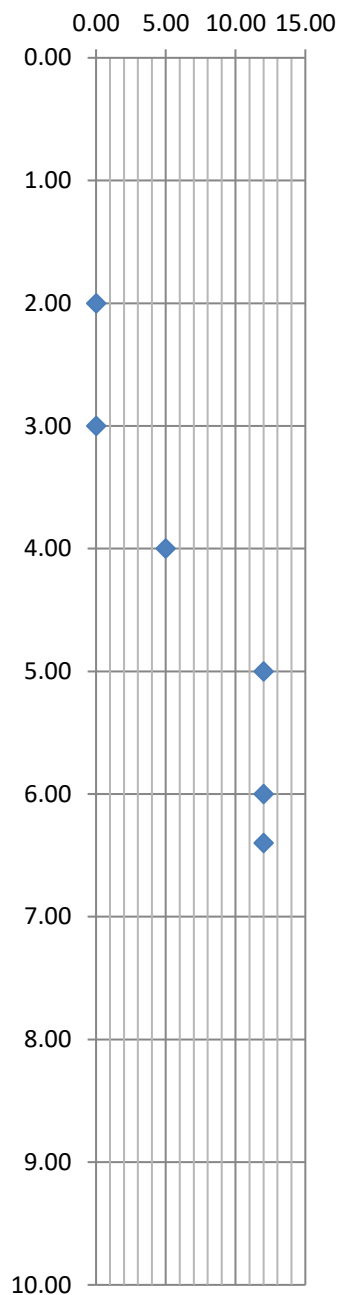
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 09/07/2024

EASTINGS 469475.93
NORTHINGS 172699.56
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

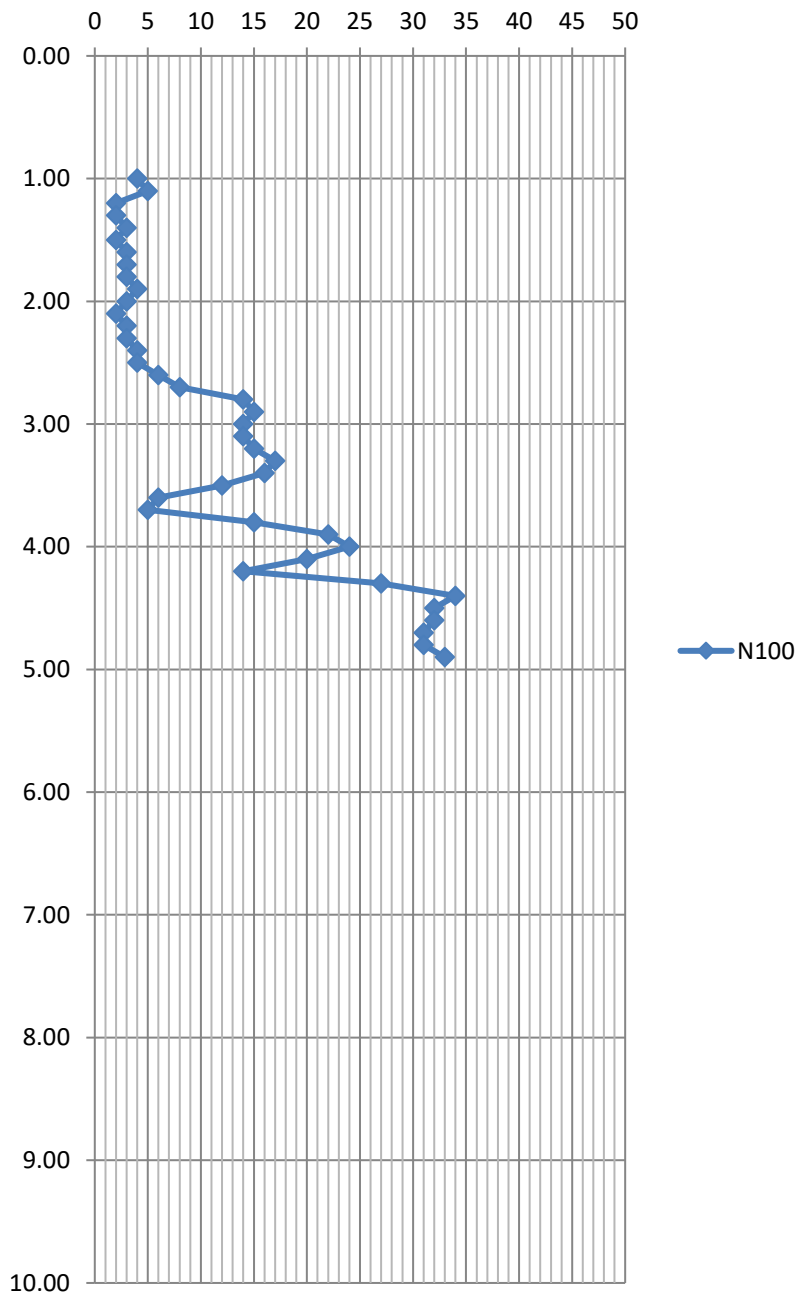


SUPER HEAVY DYNAMIC PROBE - DP111

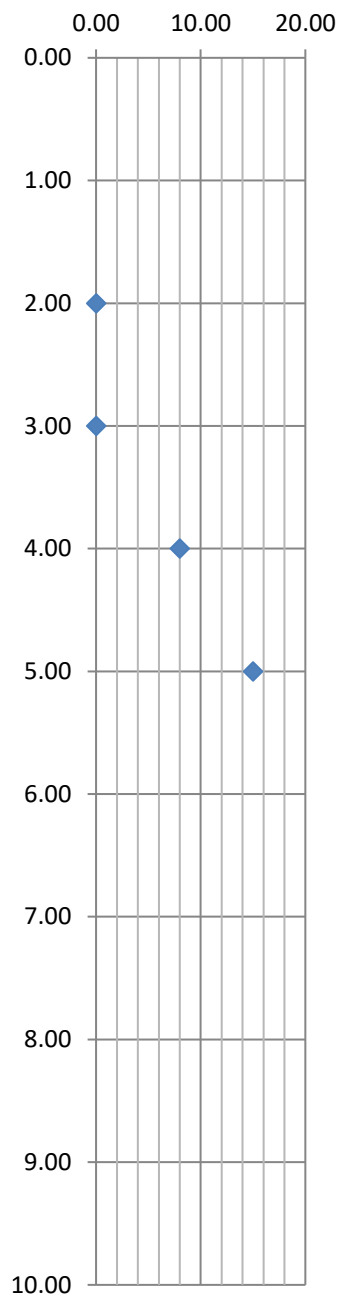
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 09/07/2024

EASTINGS 469491.93
NORTHINGS 172692.73
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground



SUPER HEAVY DYNAMIC PROBE - DP112

PROJECT NUMBER ,24-06-13

EASTINGS

PROJECT NAME Amethyst Lane, Reading

NORTHINGS

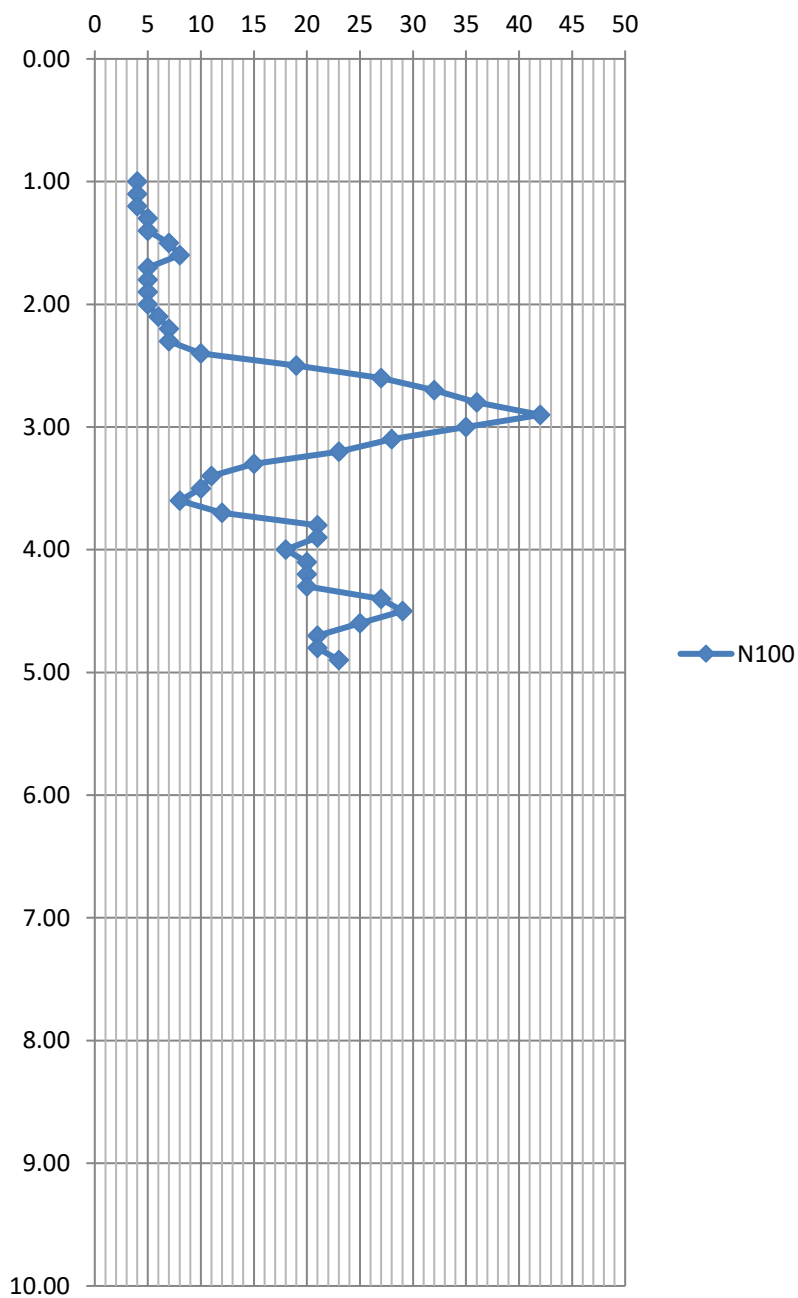
CLIENT Helix Ltd.

HAMMER WEIGHT 63.5KG

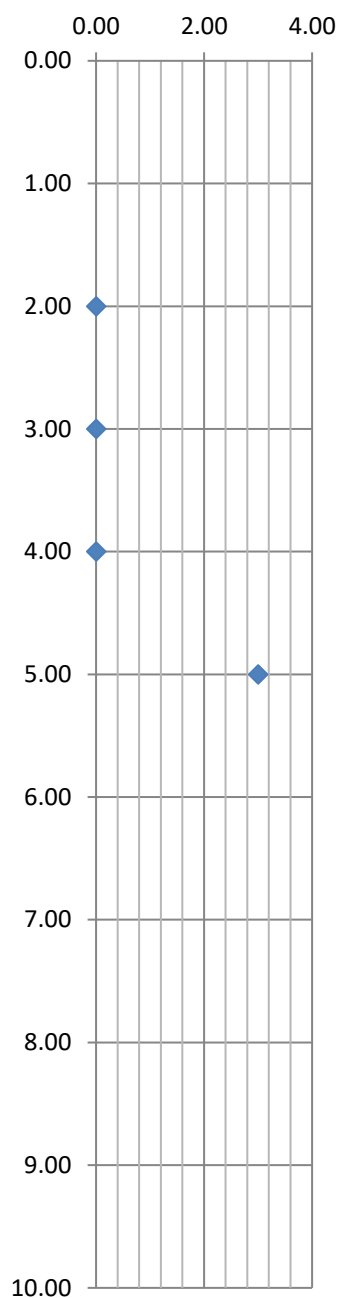
DRILLING DATE 10/07/2024

HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

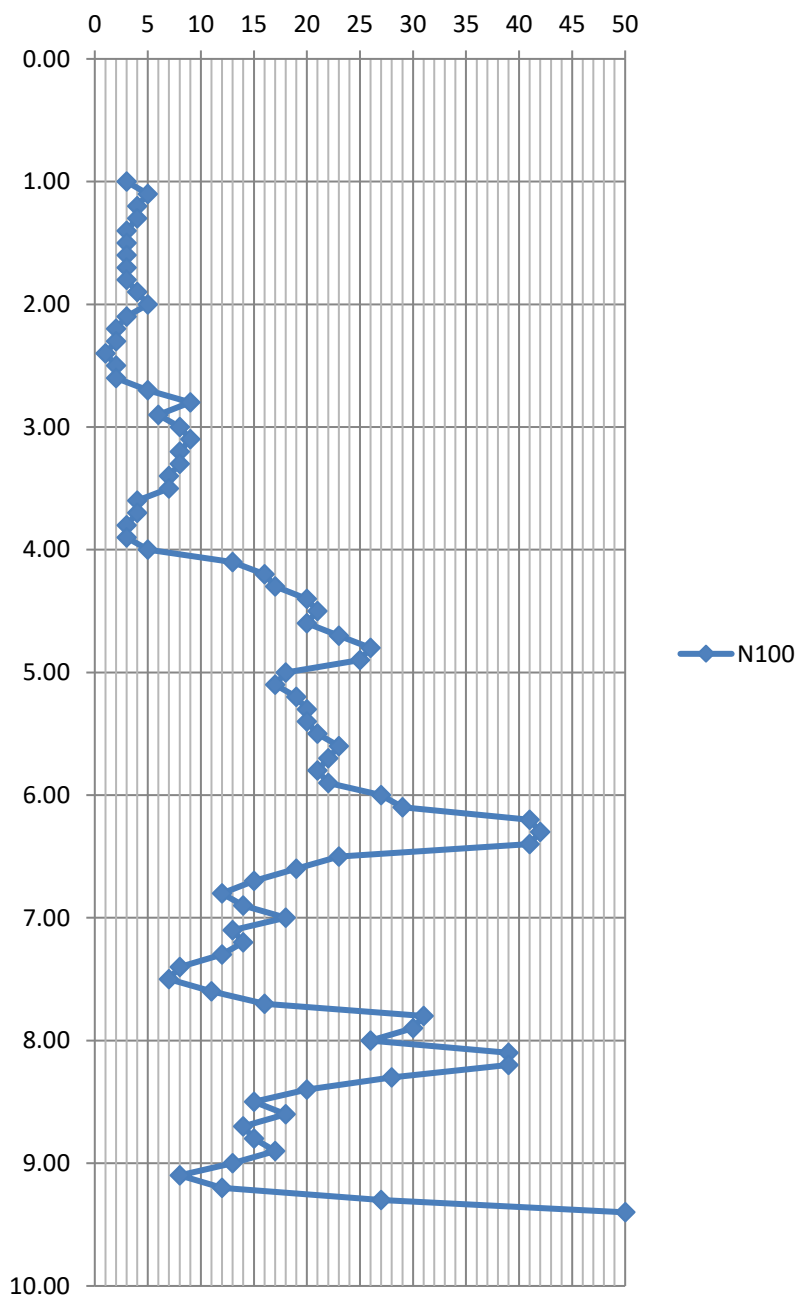


SUPER HEAVY DYNAMIC PROBE - DP113

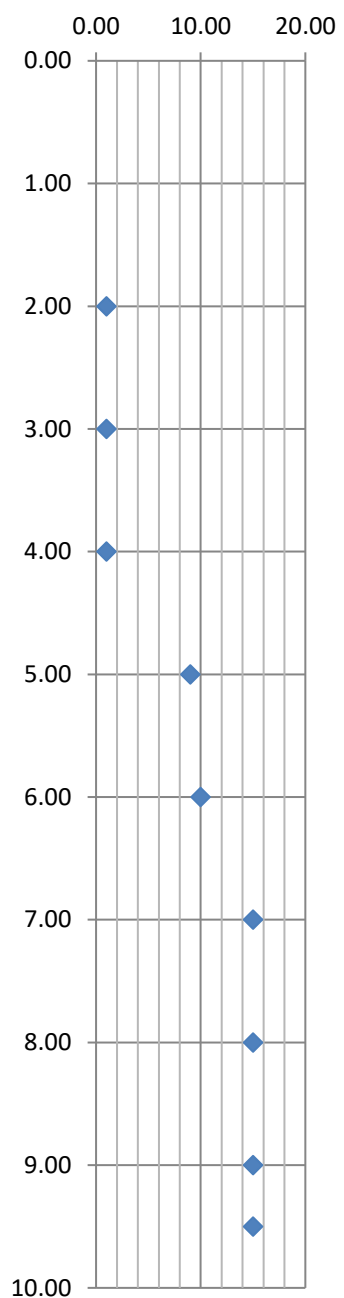
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 09/07/2024

EASTINGS 469492.11
NORTHINGS 172676.24
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

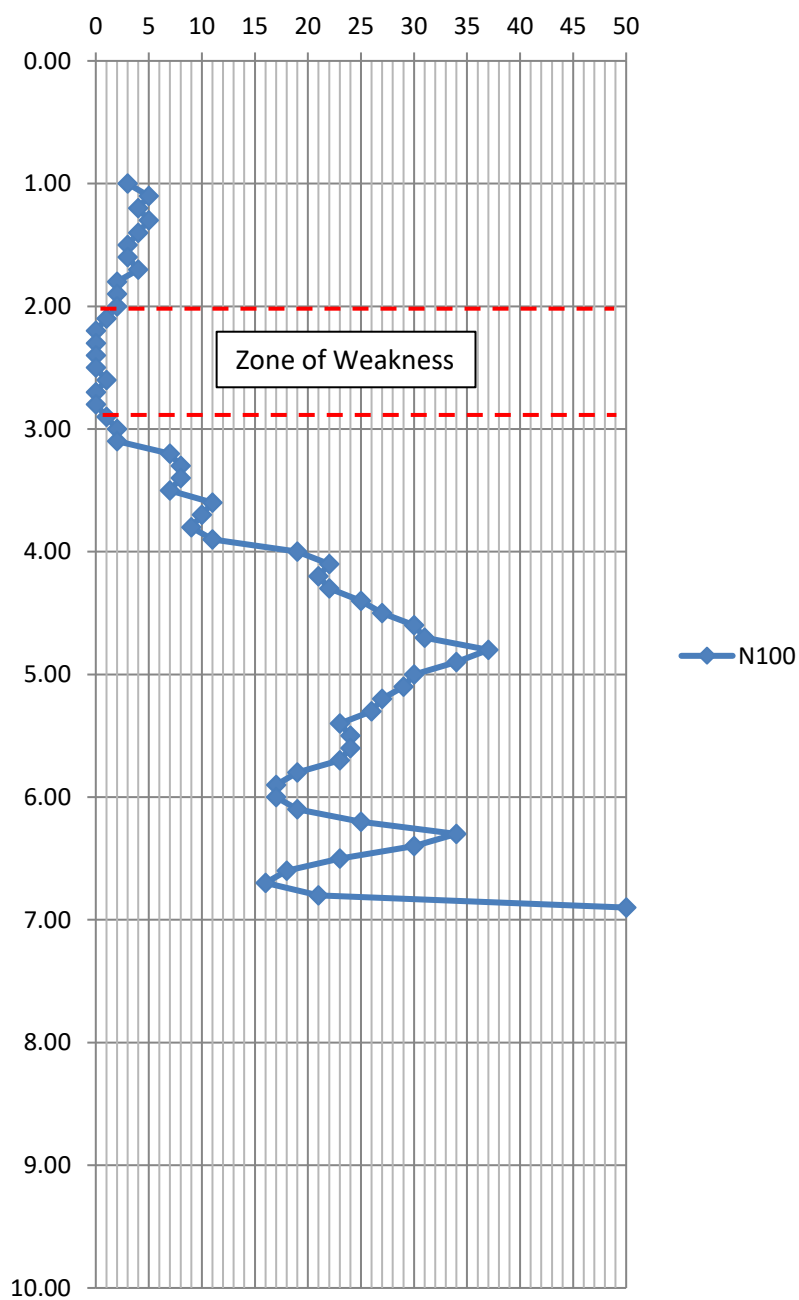


SUPER HEAVY DYNAMIC PROBE - DP114

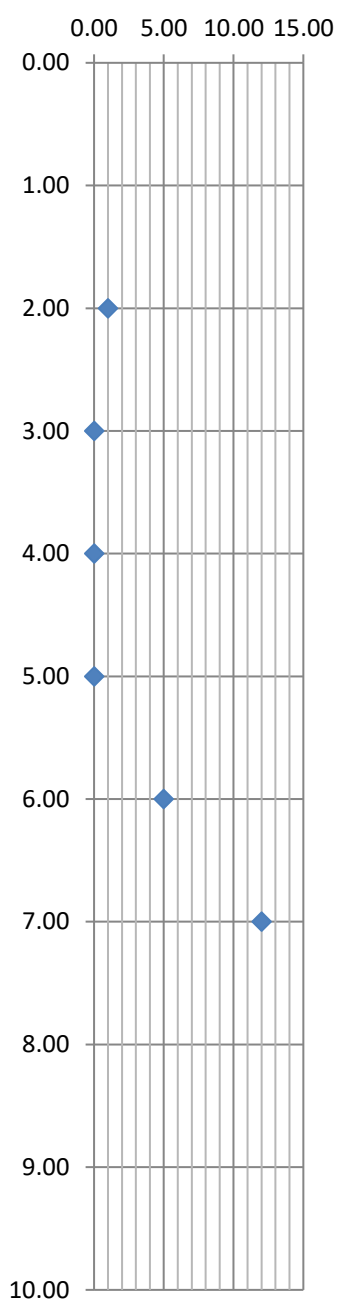
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 09/07/2024

EASTINGS 469492.96
NORTHINGS 172671.31
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- A significant thickness of weaker material is observed between 2.10m and 2.90m bgl mainly recording N100 values of 0. Potential evidence of solution feature or worked ground associated with historic mining

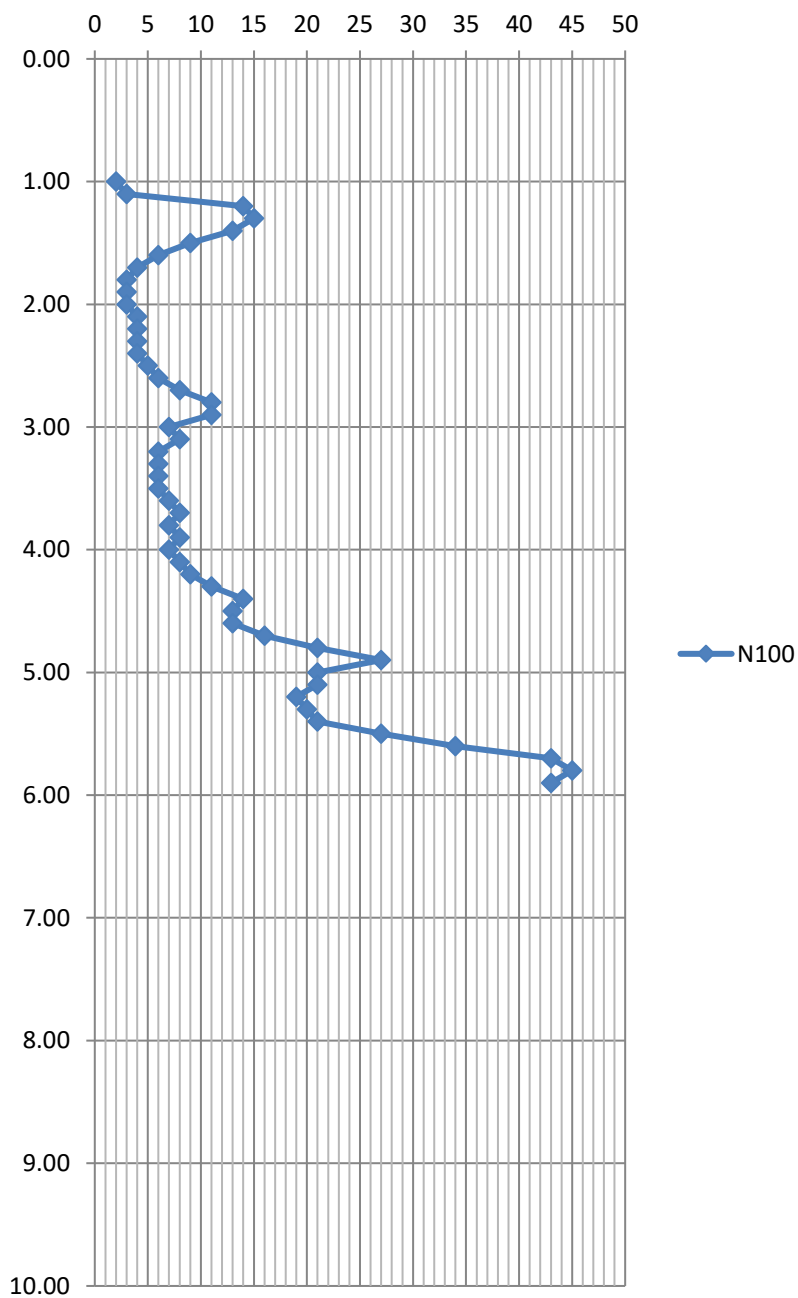


SUPER HEAVY DYNAMIC PROBE - DP115

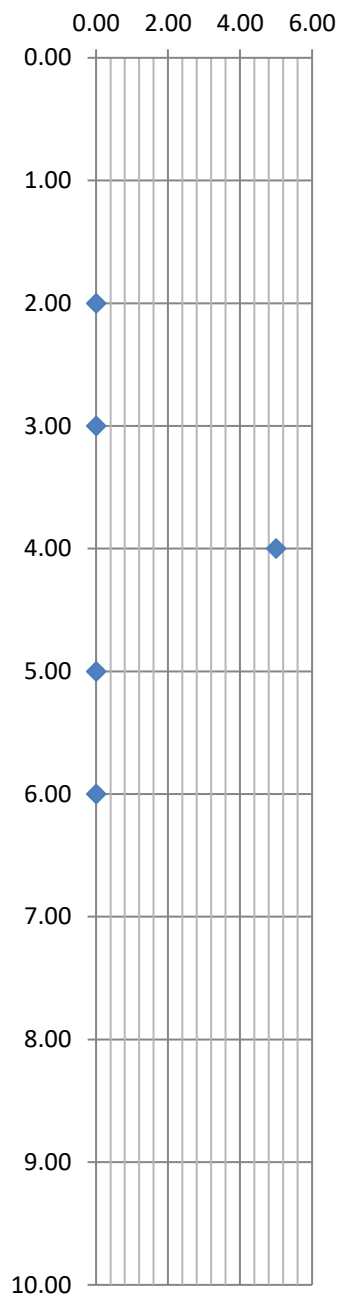
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 10/07/2024

EASTINGS 469494.64
NORTHINGS 172663.92
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

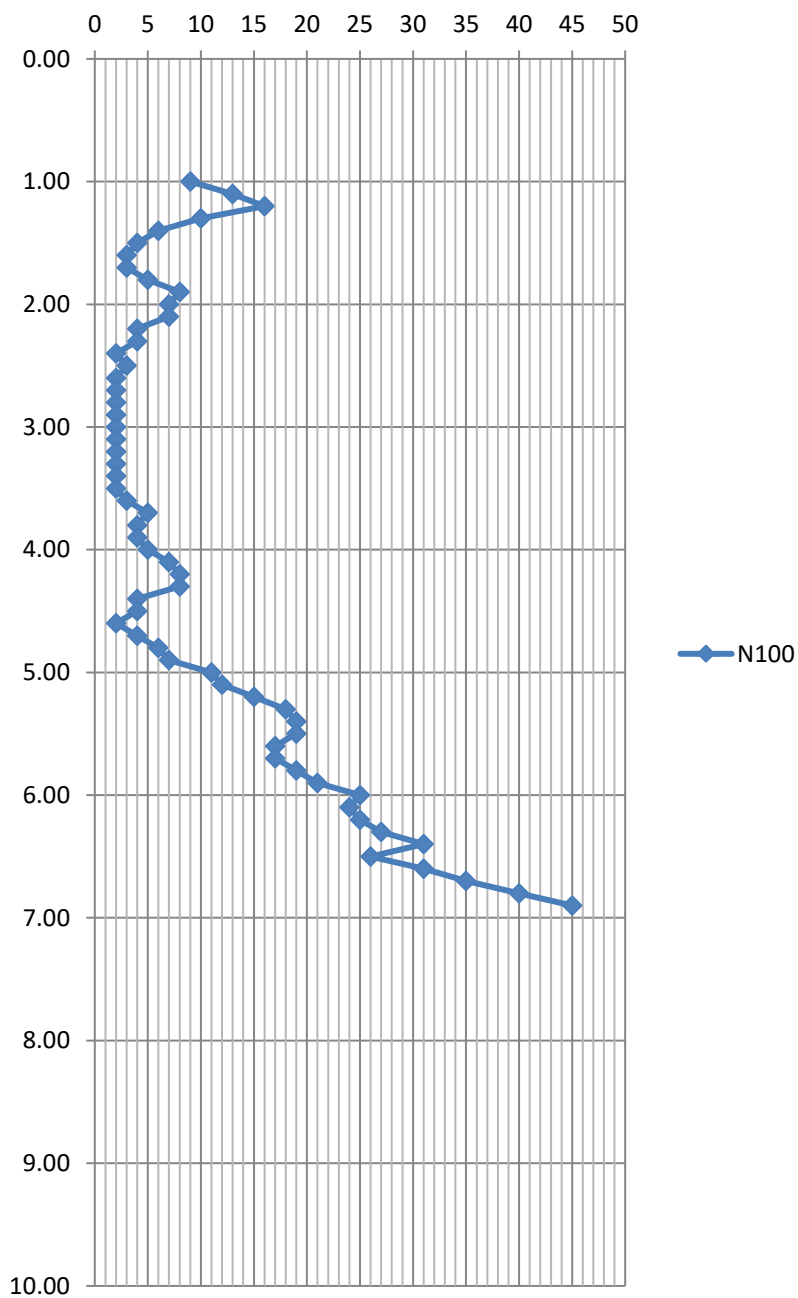


SUPER HEAVY DYNAMIC PROBE - DP116

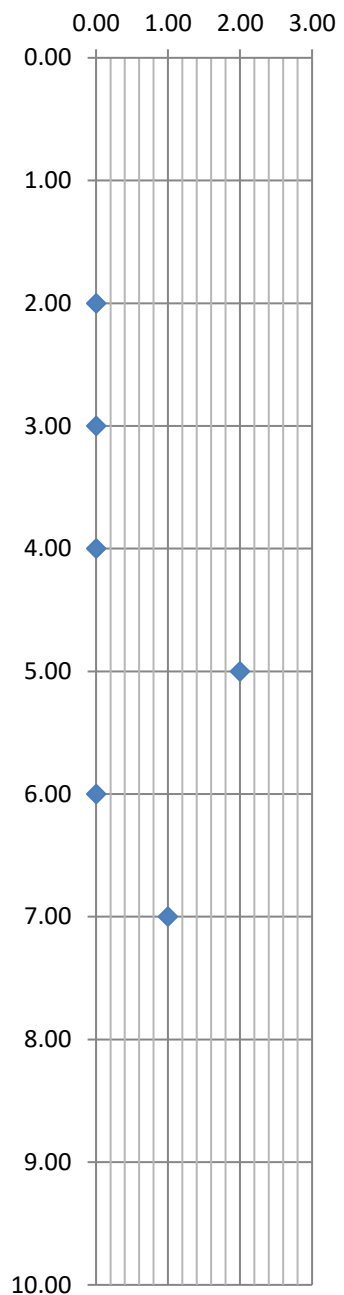
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 10/07/2024

EASTINGS 469495.78
NORTHINGS 172658.21
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

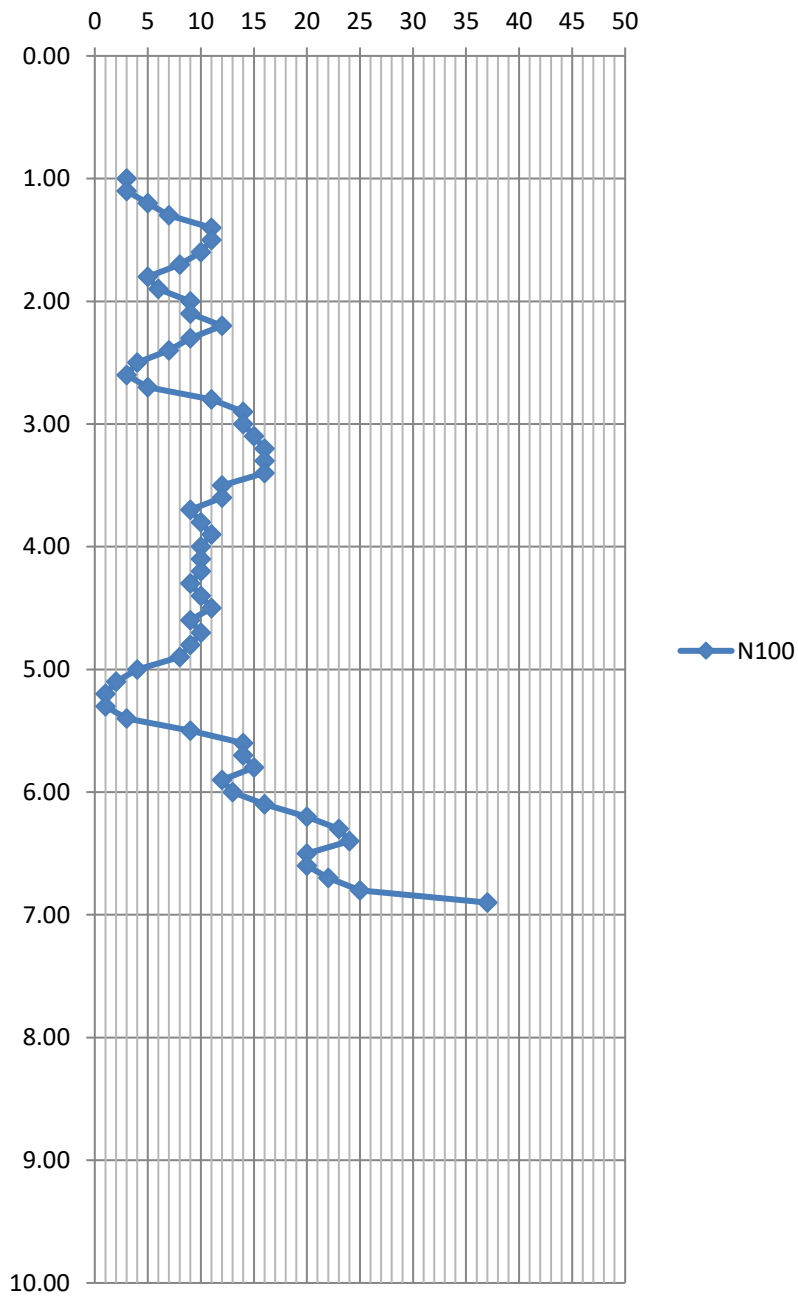


SUPER HEAVY DYNAMIC PROBE - DP117

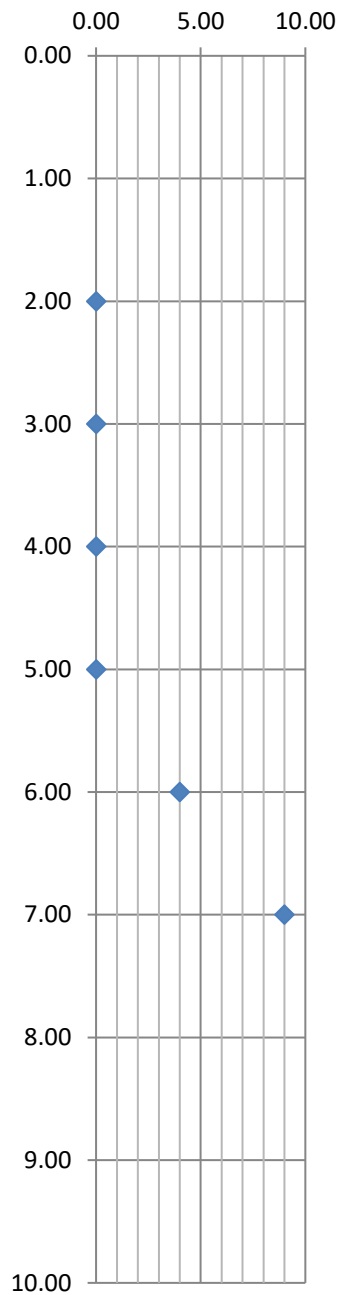
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 10/07/2024

EASTINGS 469497
NORTHINGS 172651.88
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



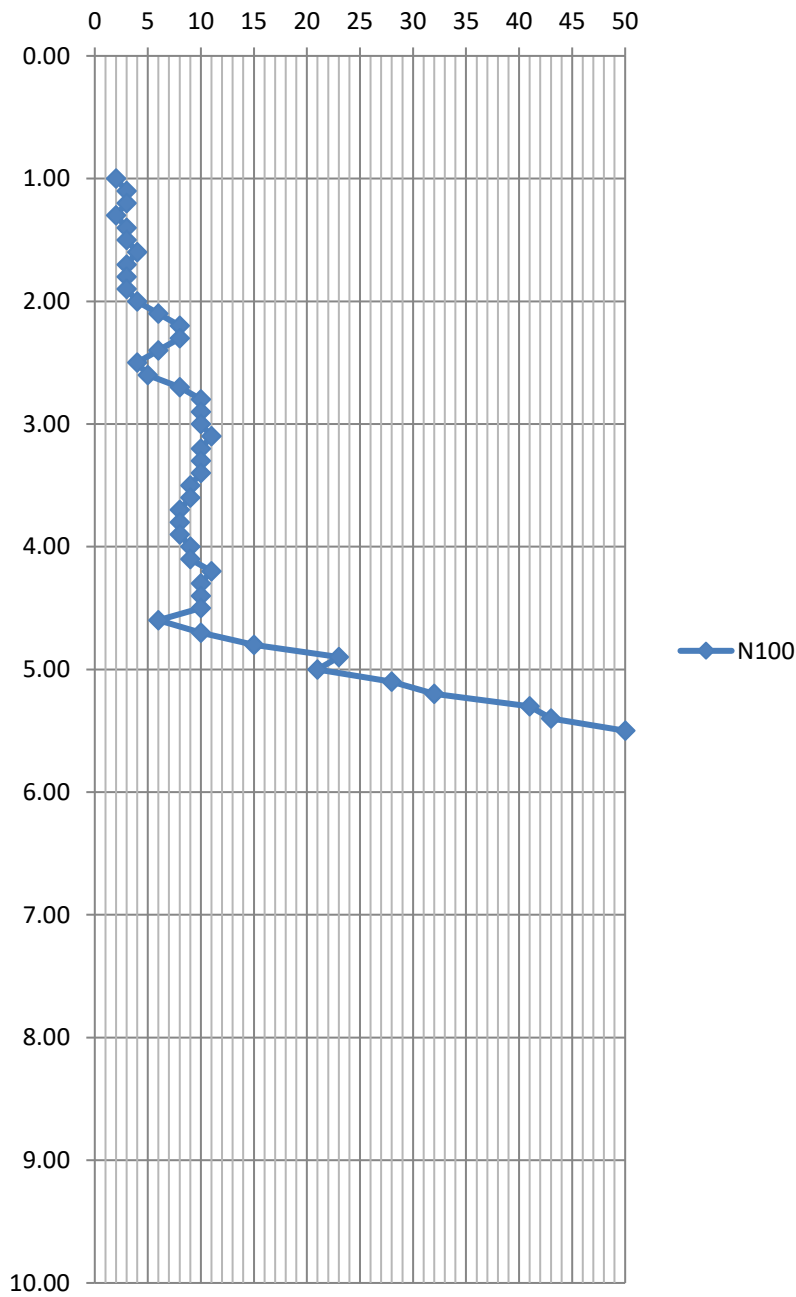
INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground



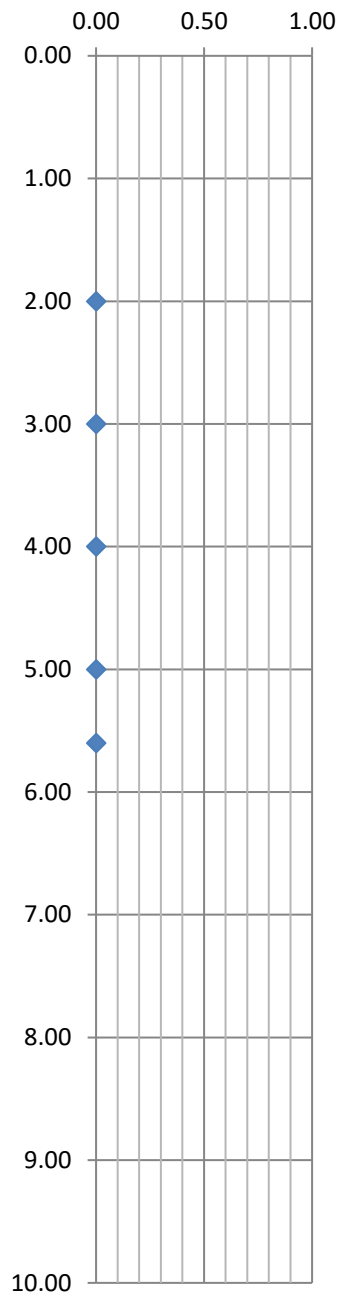
SUPER HEAVY DYNAMIC PROBE - DP118

PROJECT NUMBER	,24-06-13	EASTINGS	469485.61
PROJECT NAME	Amethyst Lane, Reading	NORTHINGS	172668.8
CLIENT	Helix Ltd.	HAMMER WEIGHT	63.5KG
DRILLING DATE	10/07/2024	HAMMER DROP	0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground



SUPER HEAVY DYNAMIC PROBE - DP119

PROJECT NUMBER ,24-06-13

EASTINGS 469486.67

PROJECT NAME Amethyst Lane, Reading

NORTHINGS 172662.57

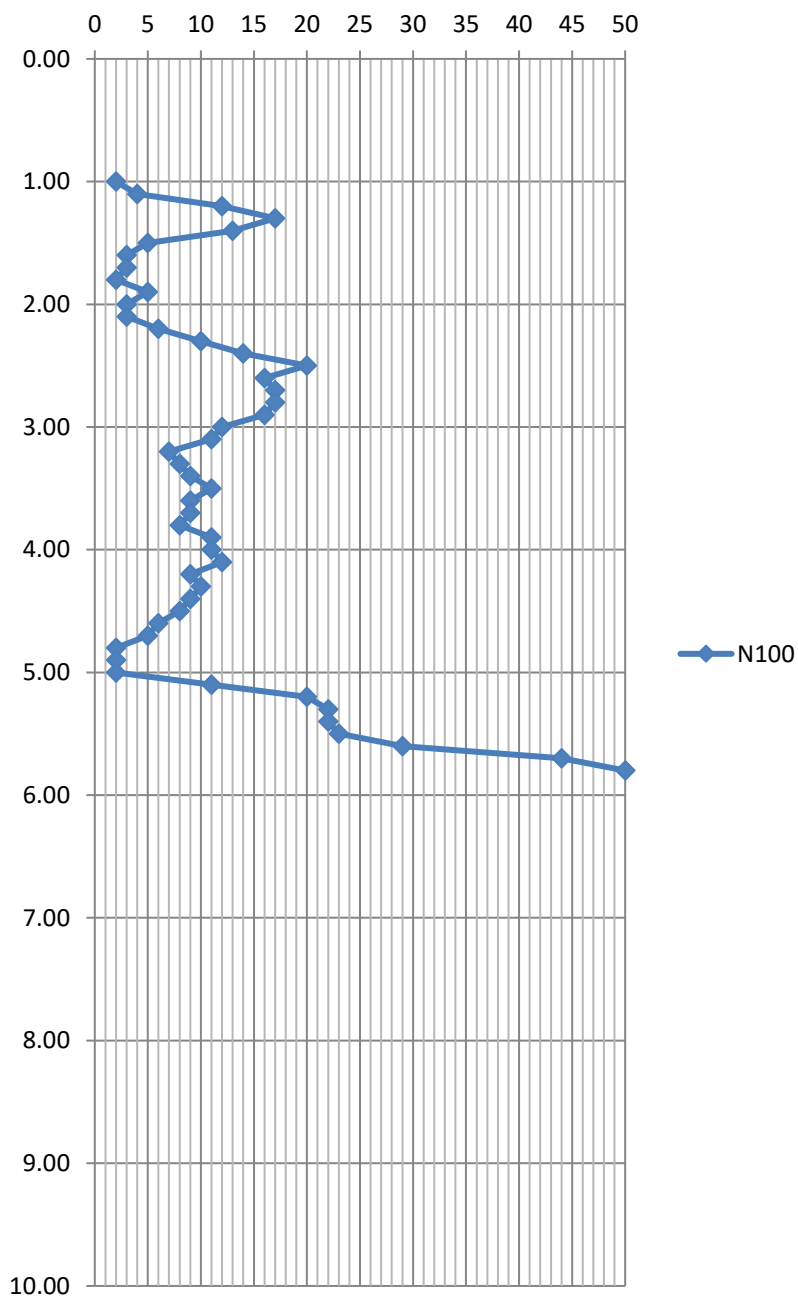
CLIENT Helix Ltd.

HAMMER WEIGHT 63.5KG

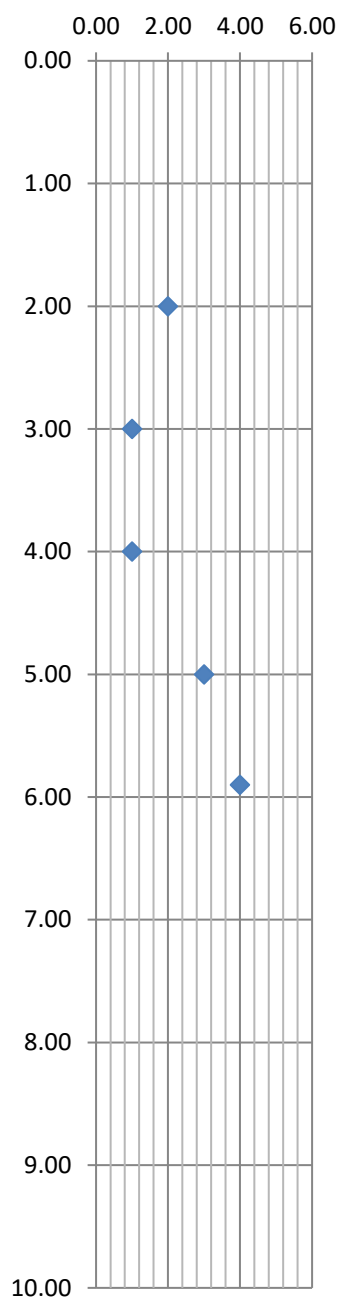
DRILLING DATE 10/07/2024

HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

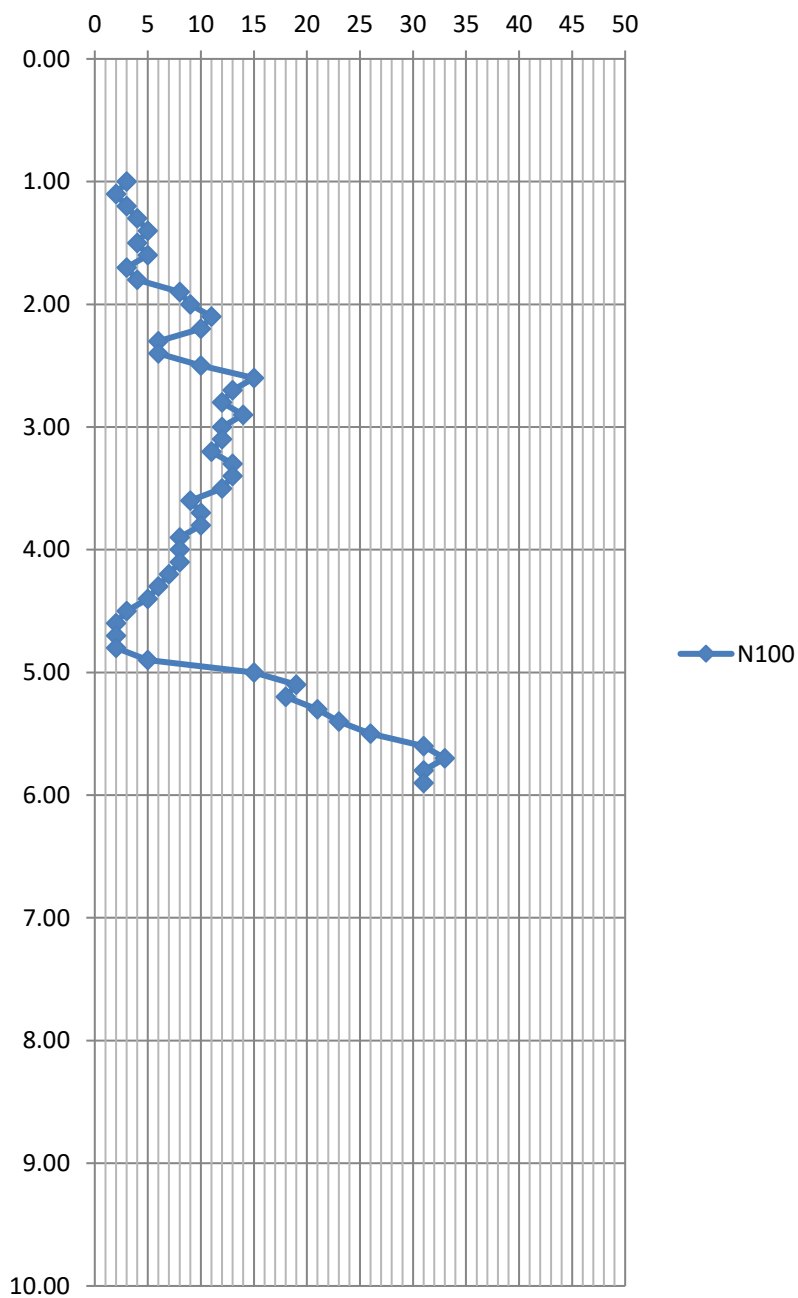


SUPER HEAVY DYNAMIC PROBE - DP120

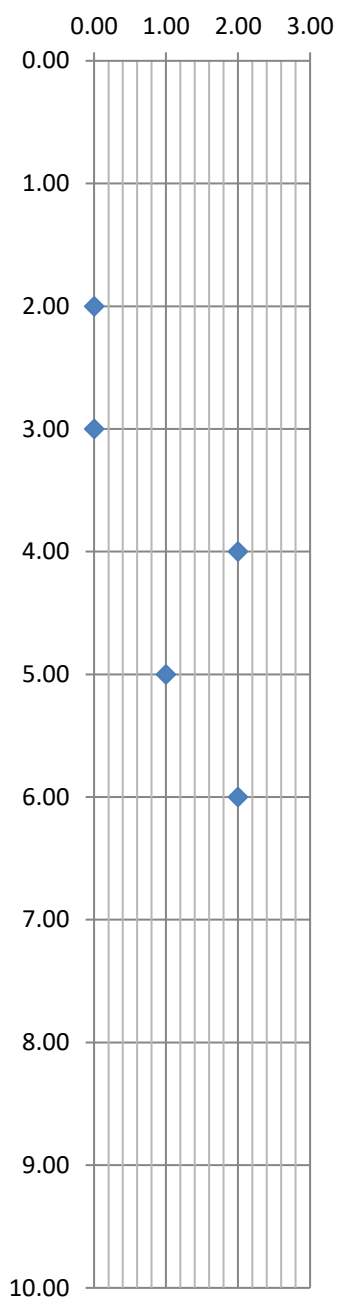
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 10/07/2024

EASTINGS 469488
NORTHINGS 172656.4
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

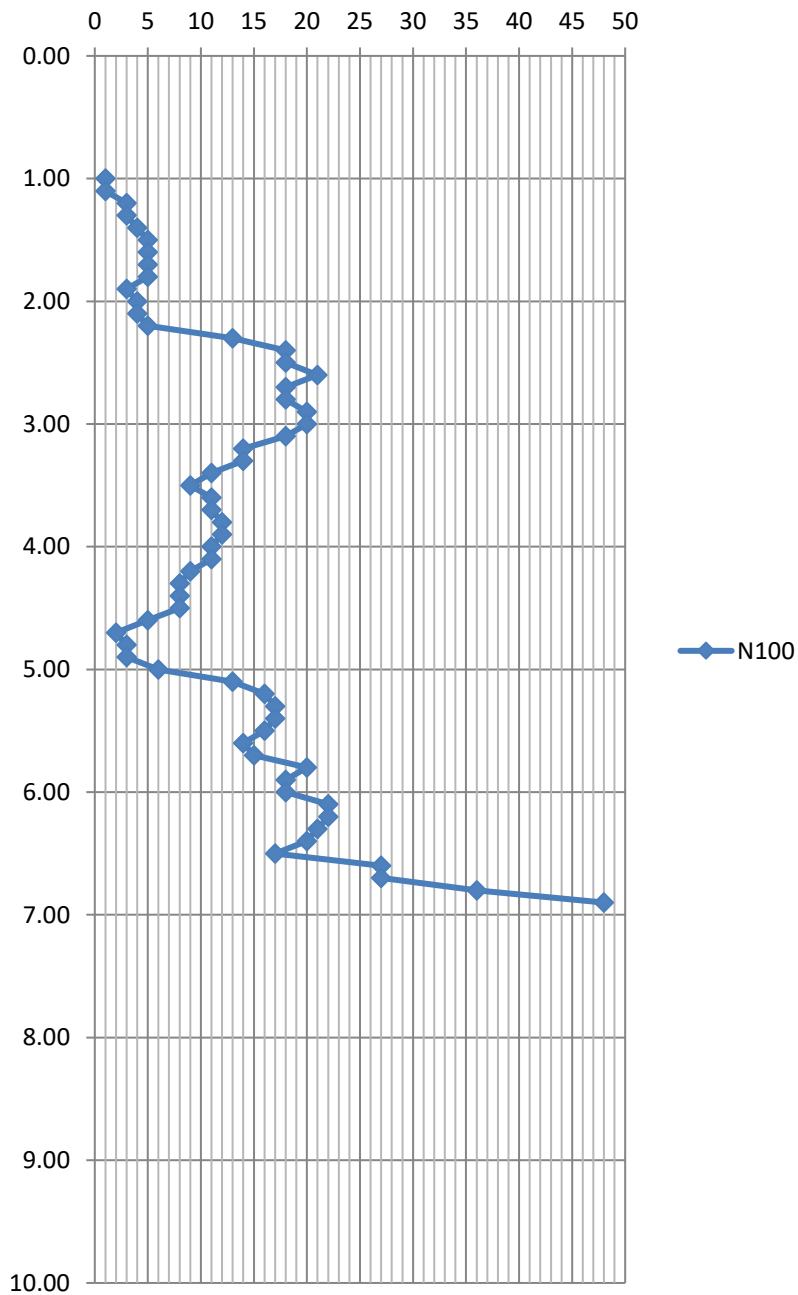


SUPER HEAVY DYNAMIC PROBE - DP121

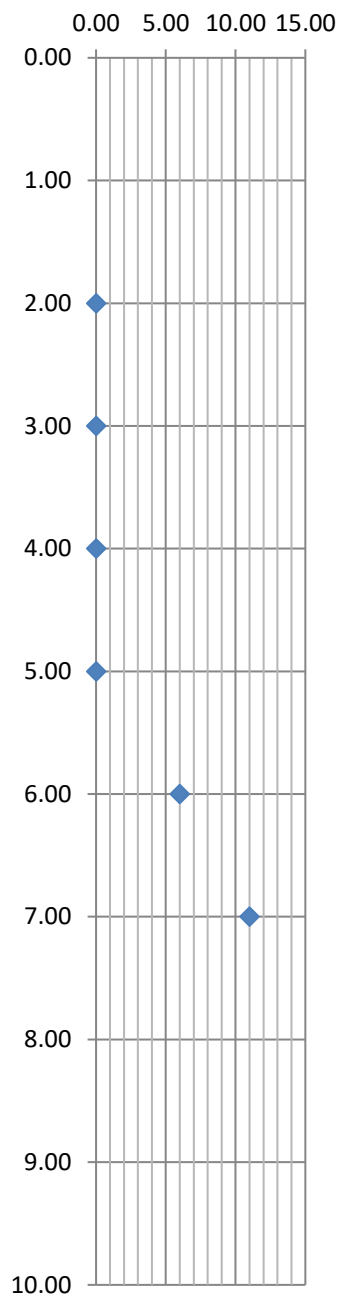
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 10/07/2024

EASTINGS 469489.23
NORTHINGS 172650.25
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

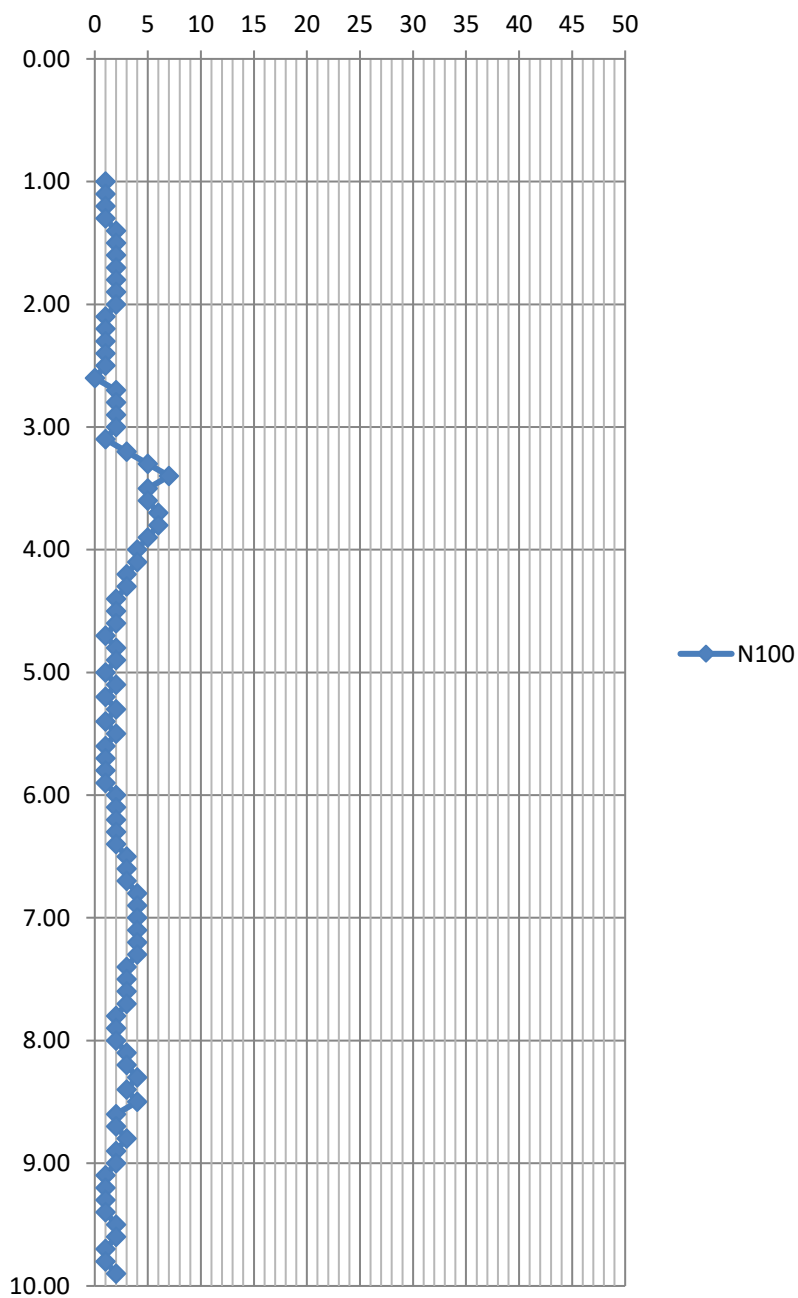


SUPER HEAVY DYNAMIC PROBE - DP122

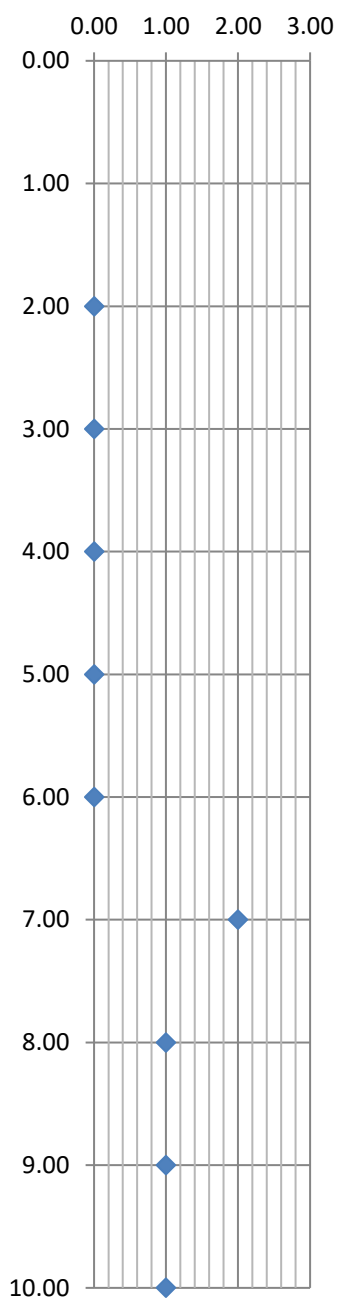
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 10/07/2024

EASTINGS 469449.55
NORTHINGS 172631.38
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:-

No major fluctuations in strength were recorded which has been typical within the Lambeth Group. The material encountered within DP122 is significantly different than the surrounding area which could be interpreted as a potential solution feature or worked/infilled ground associated with historic mining.

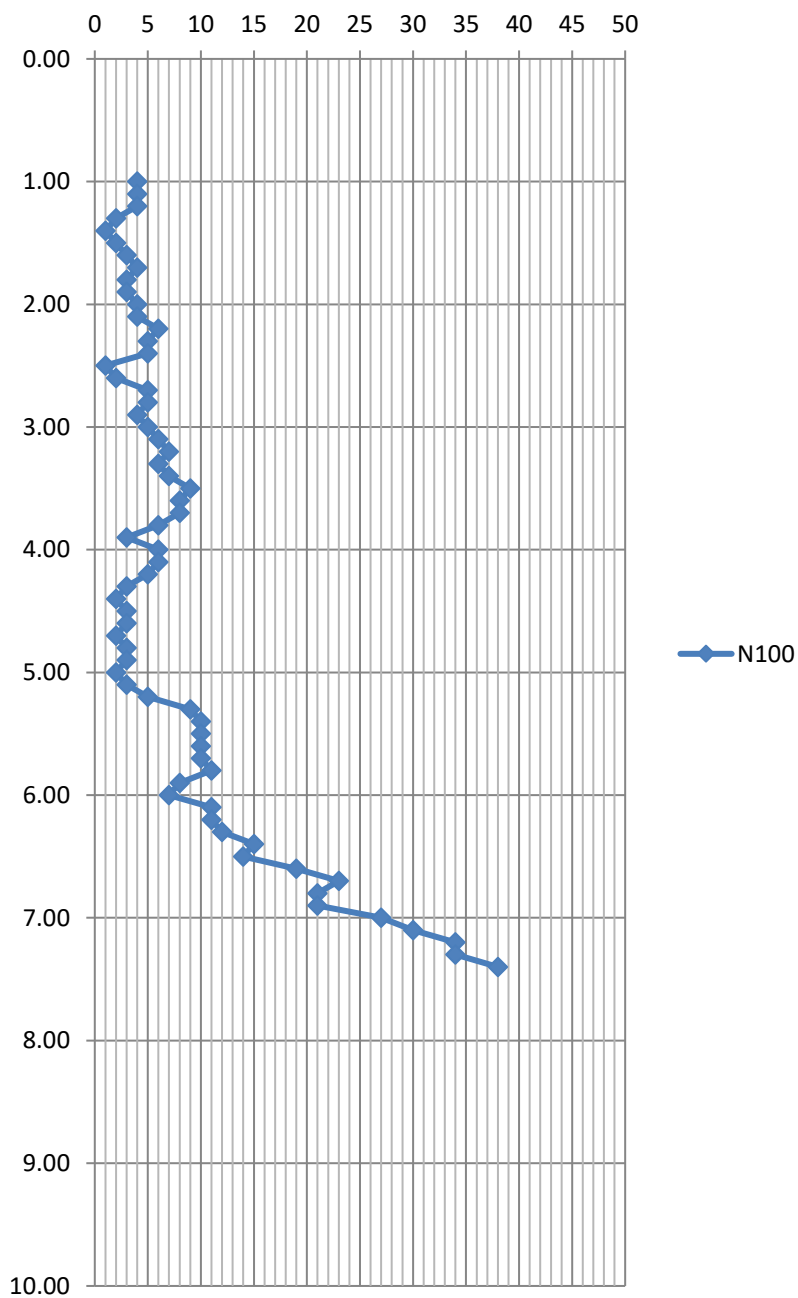


SUPER HEAVY DYNAMIC PROBE - DP123

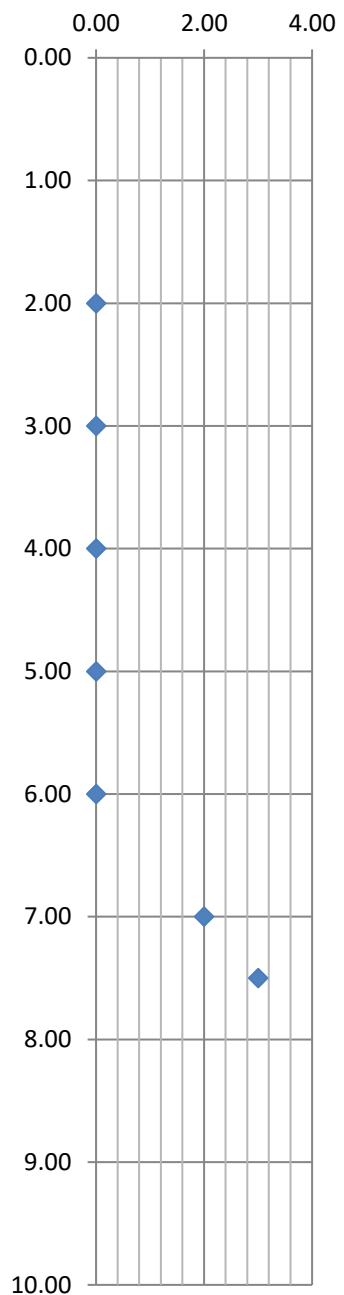
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 10/07/2024

EASTINGS 469455.6
NORTHINGS 172632.9
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground



SUPER HEAVY DYNAMIC PROBE - DP124

PROJECT NUMBER ,24-06-13

EASTINGS 469460.68

PROJECT NAME Amethyst Lane, Reading

NORTHINGS 172634.02

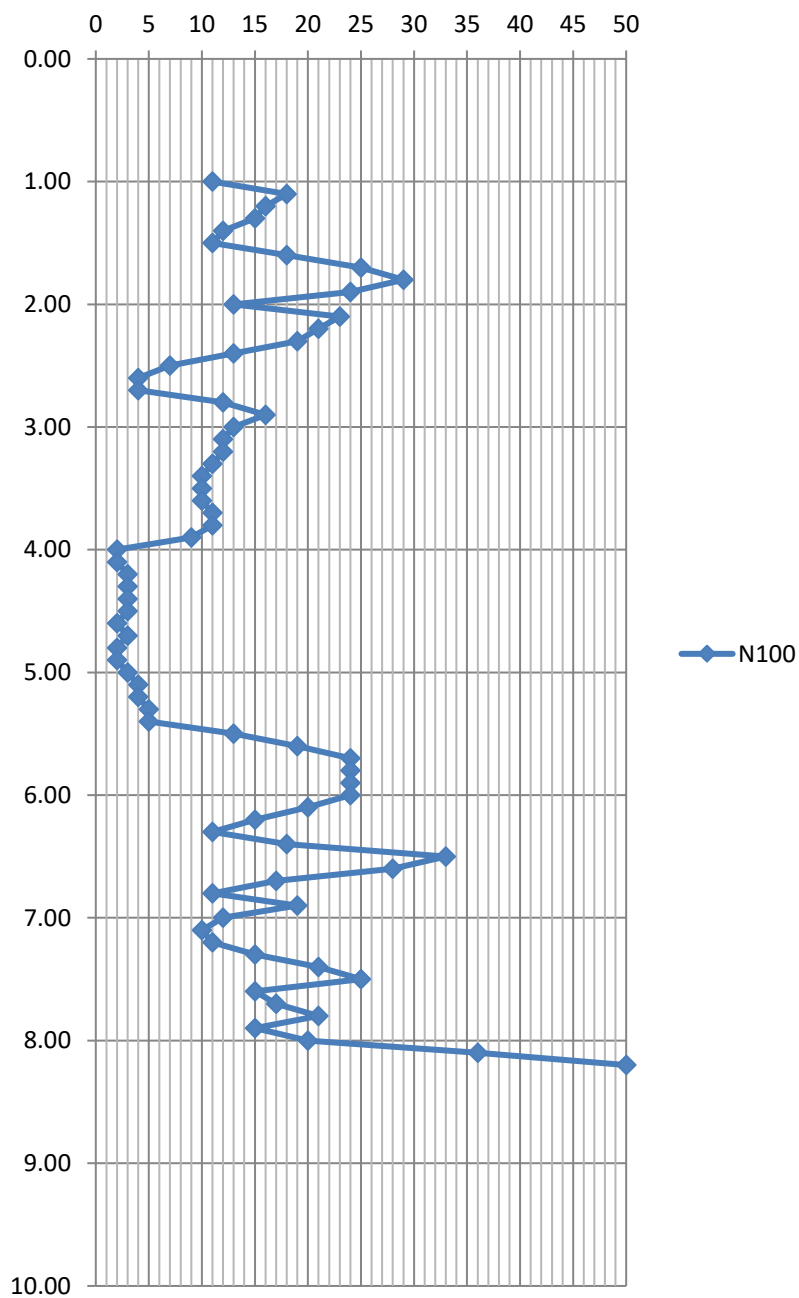
CLIENT Helix Ltd.

HAMMER WEIGHT 63.5KG

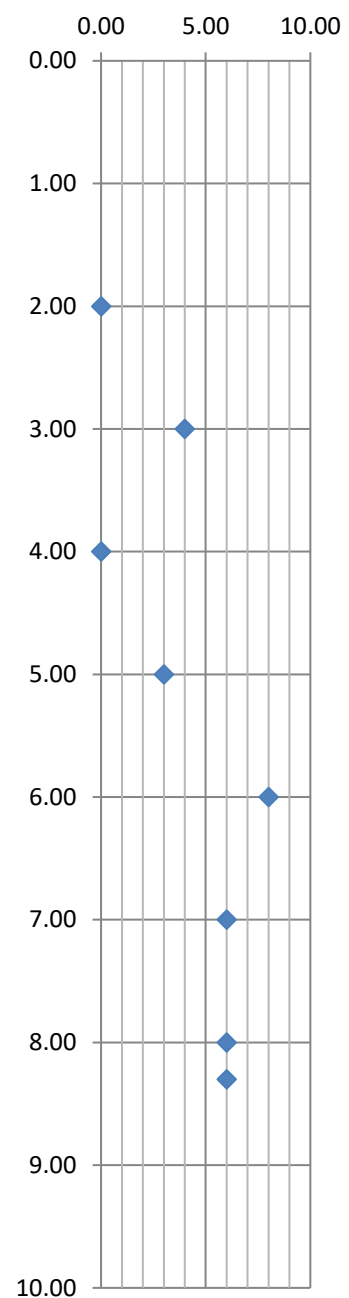
DRILLING DATE 10/07/2024

HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground



SUPER HEAVY DYNAMIC PROBE - DP125

PROJECT NUMBER ,24-06-13

EASTINGS 469464

PROJECT NAME Amethyst Lane, Reading

NORTHINGS 172629

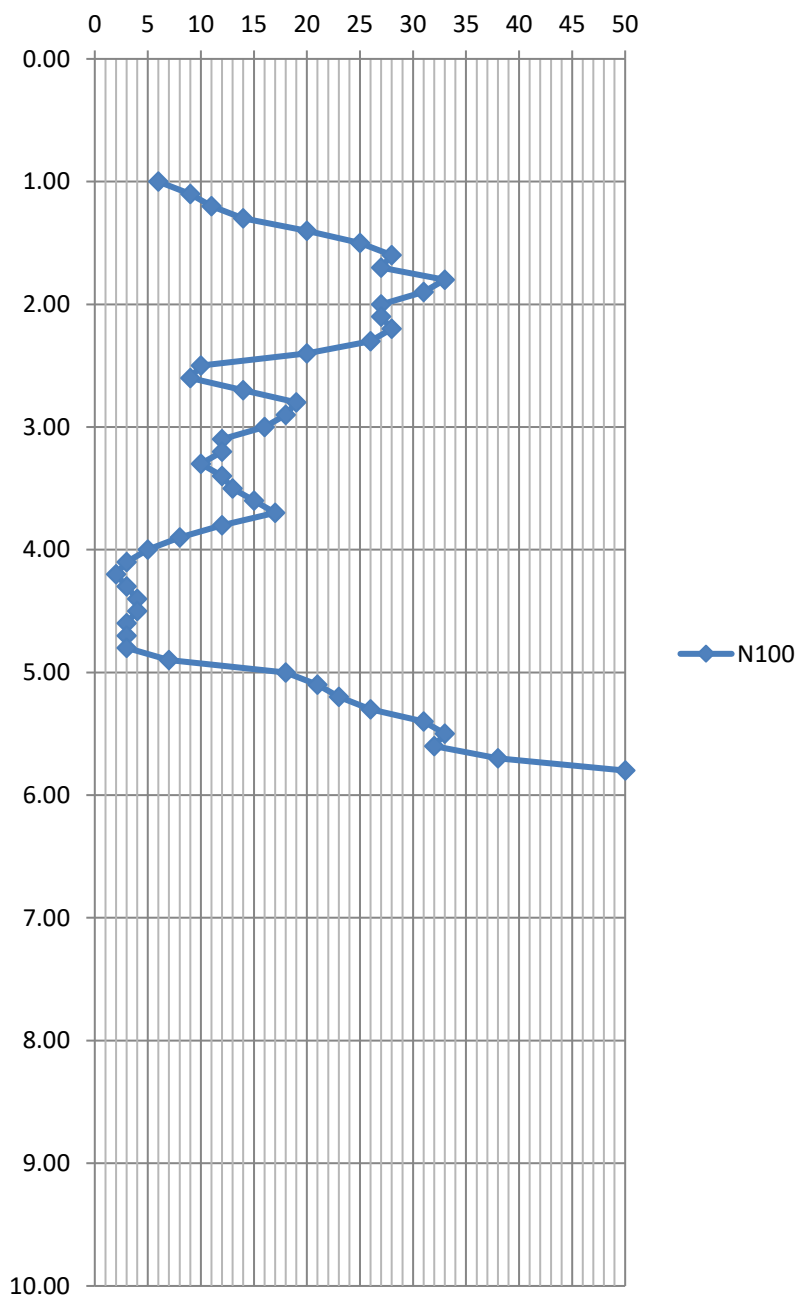
CLIENT Helix Ltd.

HAMMER WEIGHT 63.5KG

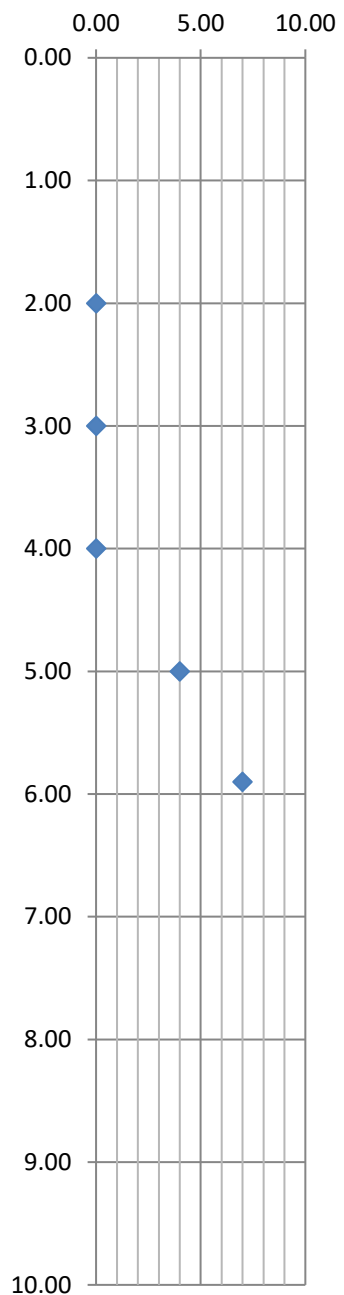
DRILLING DATE 11/07/2024

HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground



SUPER HEAVY DYNAMIC PROBE - DP126

PROJECT NUMBER ,24-06-13

EASTINGS 469465

PROJECT NAME Amethyst Lane, Reading

NORTHINGS 172624

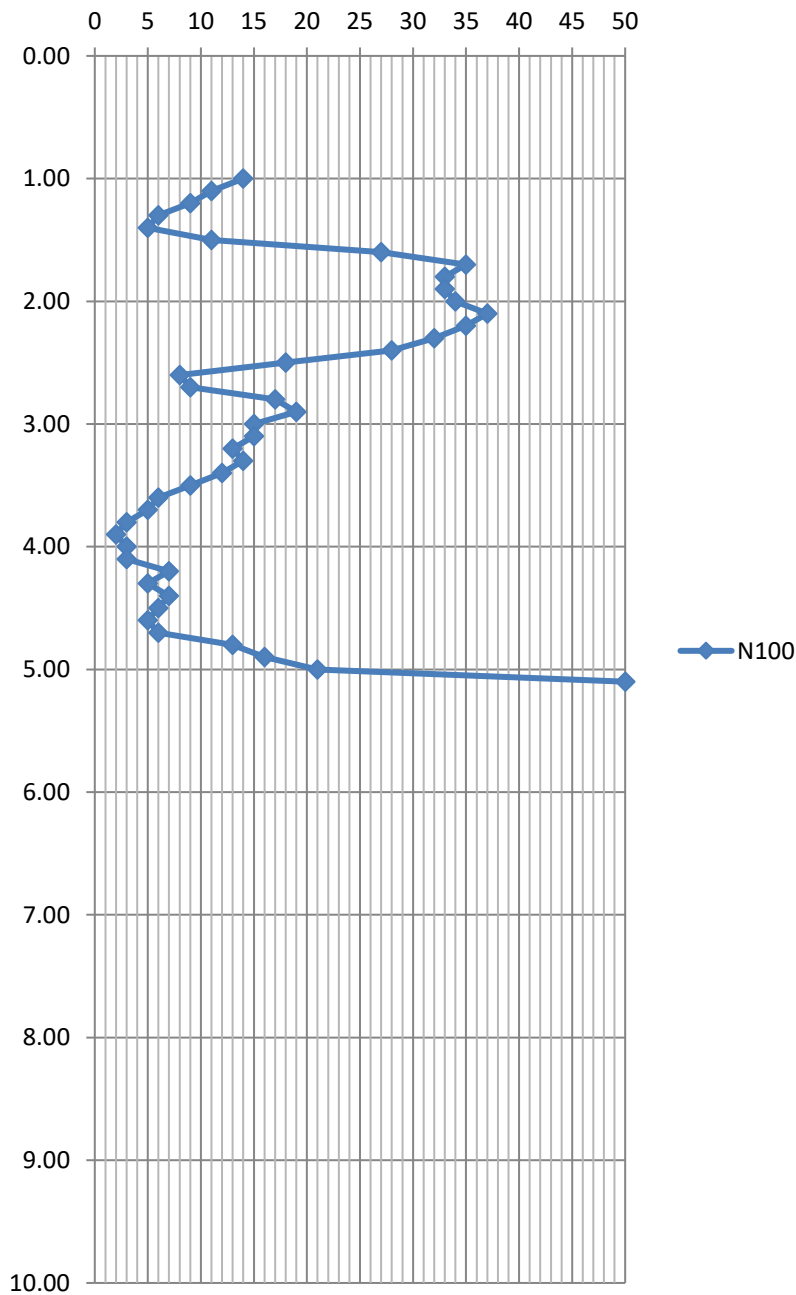
CLIENT Helix Ltd.

HAMMER WEIGHT 63.5KG

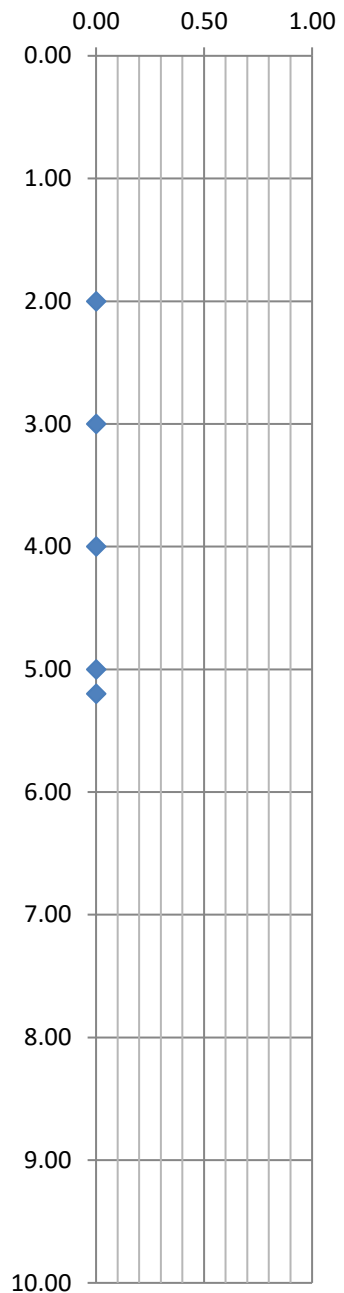
DRILLING DATE 11/07/2024

HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground



SUPER HEAVY DYNAMIC PROBE - DP127

PROJECT NUMBER ,24-06-13

EASTINGS 469459

PROJECT NAME Amethyst Lane, Reading

NORTHINGS 172623

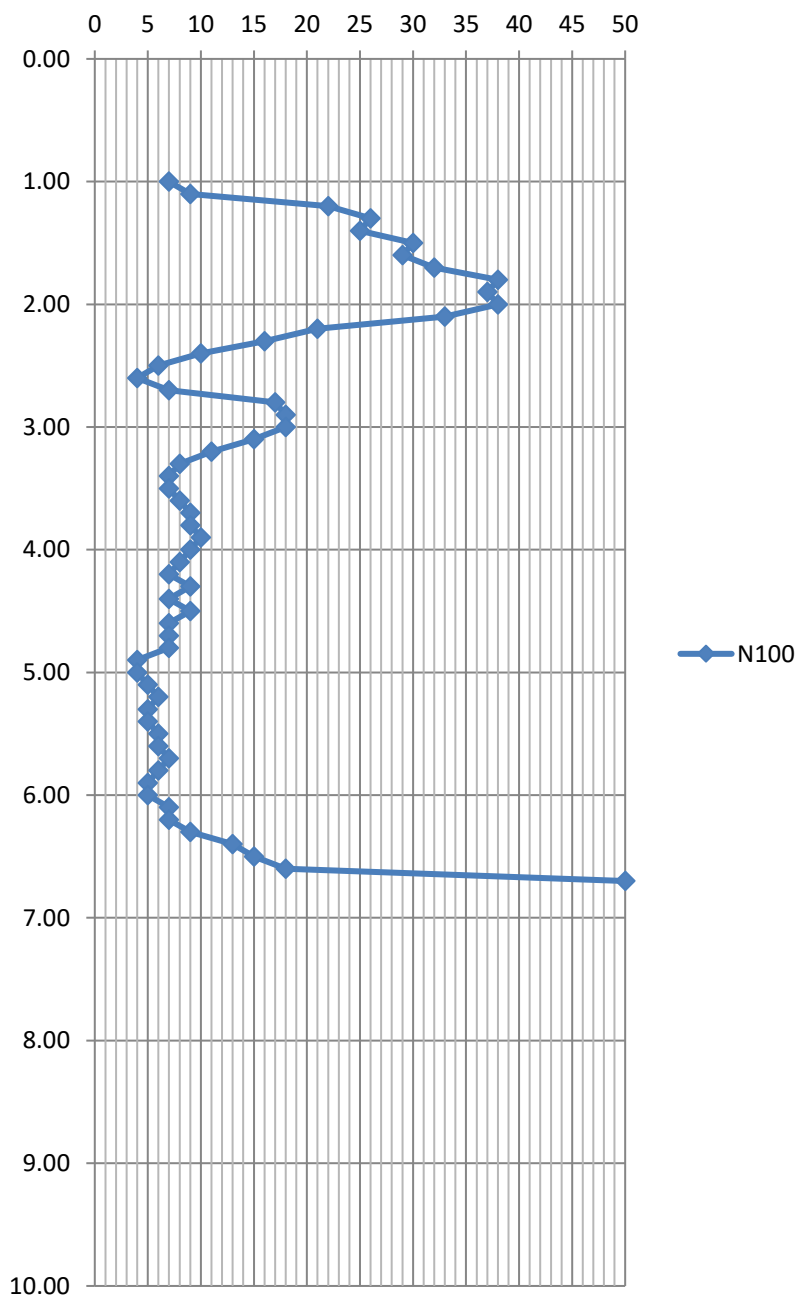
CLIENT Helix Ltd.

HAMMER WEIGHT 63.5KG

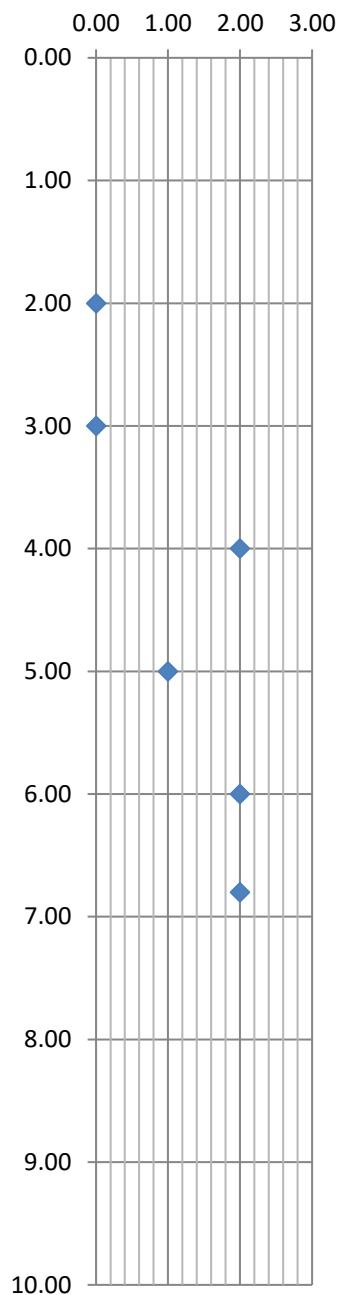
DRILLING DATE 11/07/2024

HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

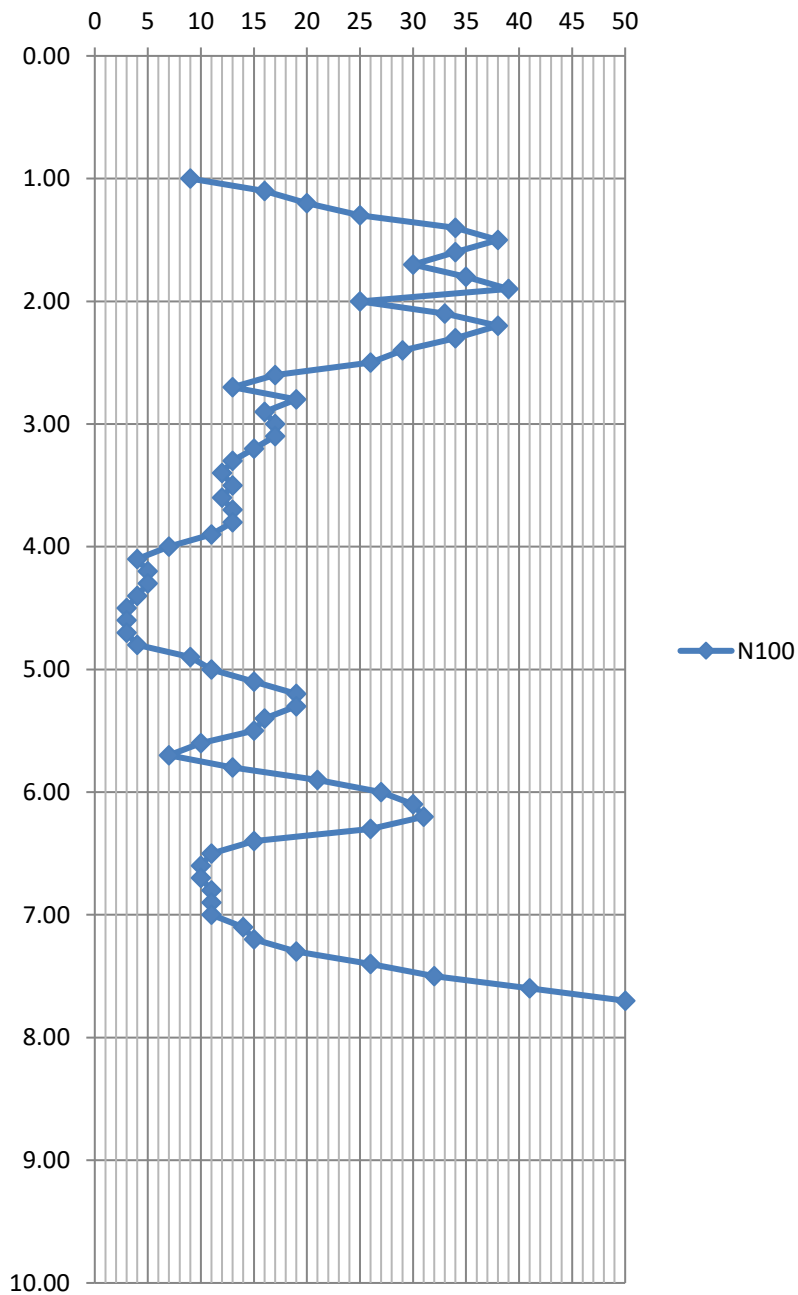


SUPER HEAVY DYNAMIC PROBE - DP128

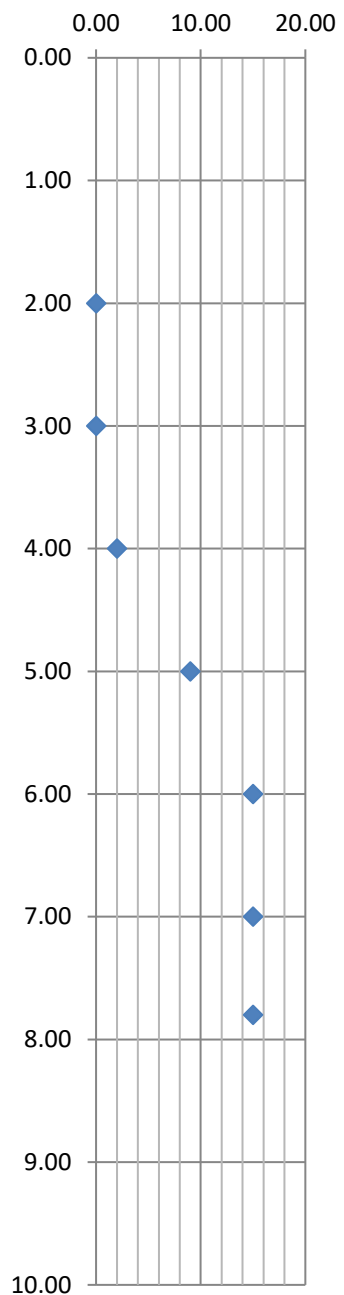
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 11/07/2024

EASTINGS 469454
NORTHINGS 172620
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



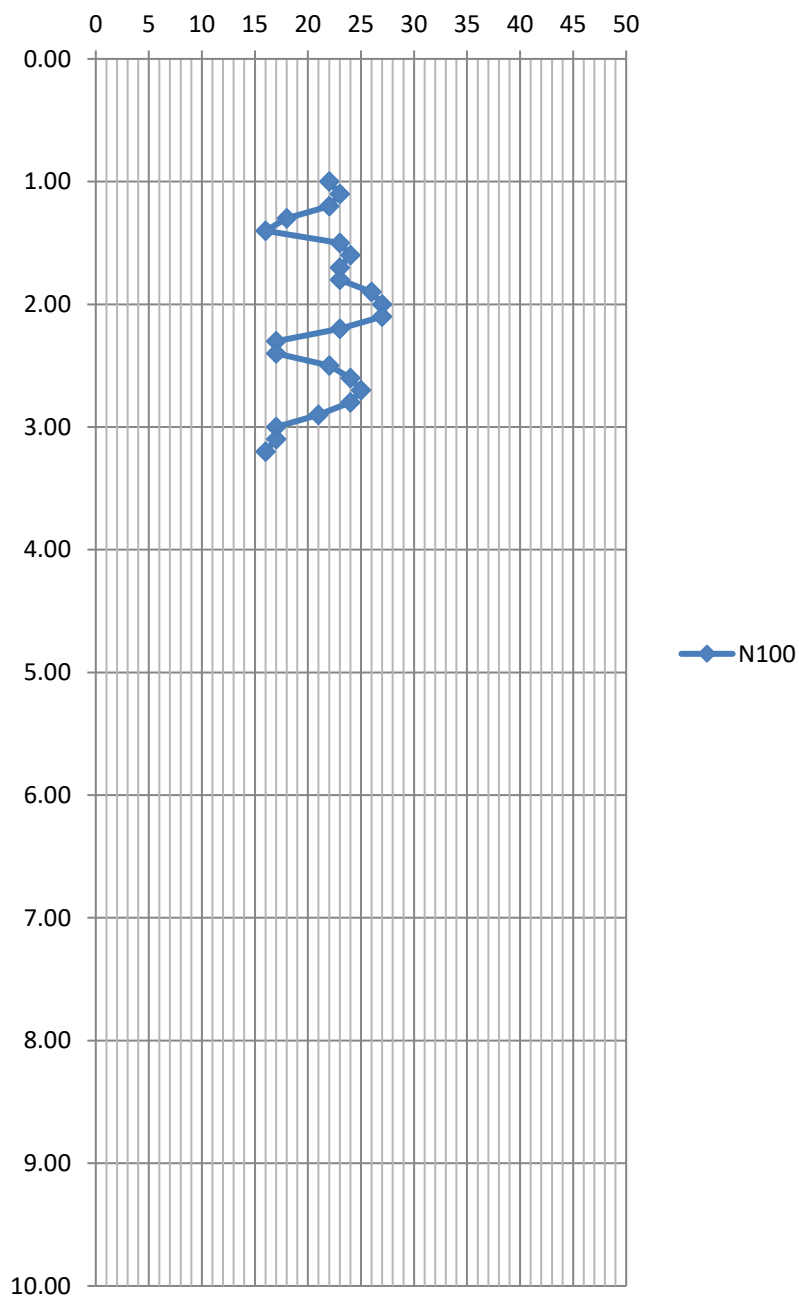
INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground



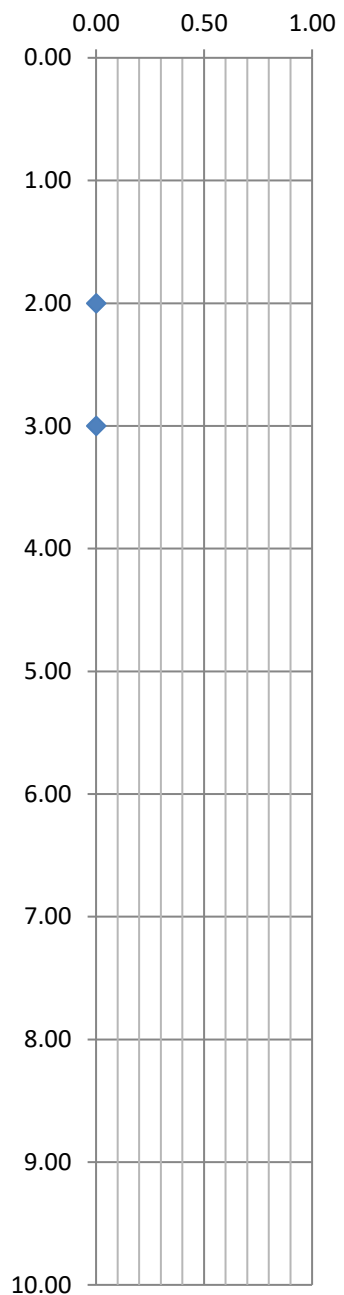
SUPER HEAVY DYNAMIC PROBE - DP129

PROJECT NUMBER	,24-06-13	EASTINGS	469465.79
PROJECT NAME	Amethyst Lane, Reading	NORTHINGS	172651.52
CLIENT	Helix Ltd.	HAMMER WEIGHT	63.5KG
DRILLING DATE	11/07/2024	HAMMER DROP	0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

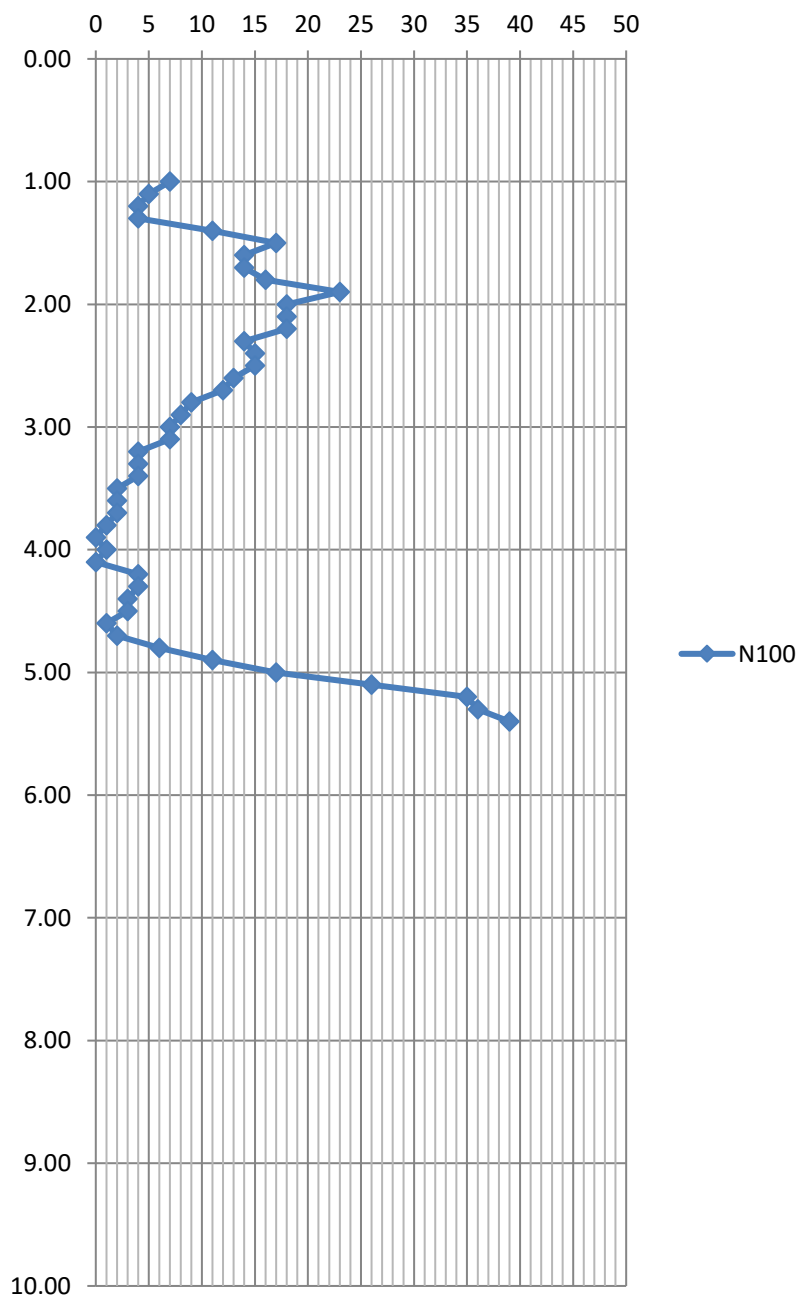


SUPER HEAVY DYNAMIC PROBE - DP130

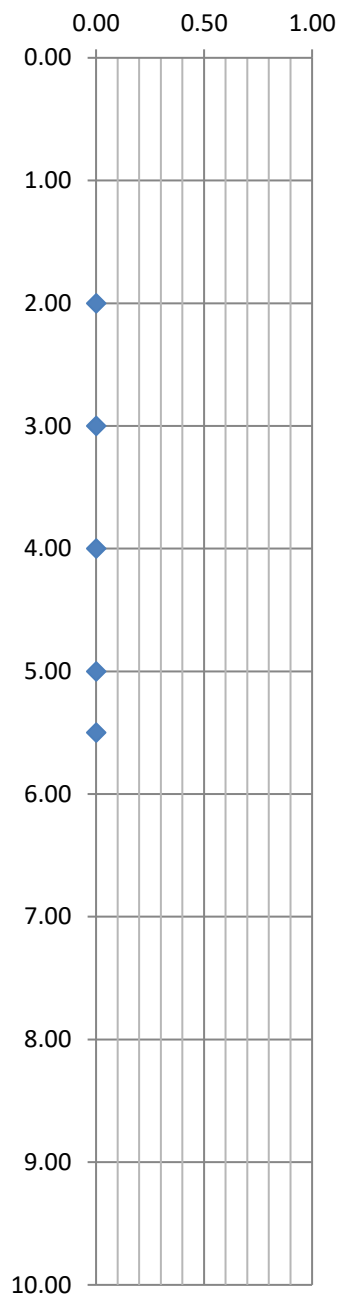
PROJECT NUMBER ,24-06-13
PROJECT NAME Amethyst Lane, Reading
CLIENT Helix Ltd.
DRILLING DATE 11/07/2024

EASTINGS 469464.23
NORTHINGS 172655.21
HAMMER WEIGHT 63.5KG
HAMMER DROP 0.76m

N100



Torque



INTERPRETED GROUND CONDITIONS:- No significant evidence of weakened or voided ground

APPENDIX C



4161



7 - 11 Harding Street
Leicester
LE1 4DH

Geo-Integrity
4 Church Street
Buckingham
MK18 1QE

Analytical Test Report: L24/06372/GIN - 24-47419

Your Project Reference:	Amethyst Lane, Reading, RG30 2EZ 24-06-13		
Your Order Number:	Q24-00626/1	Samples Received / Instructed:	15/07/2024 / 15/07/2024
Report Issue Number:	1	Sample Tested:	15/07 to 24/07/2024
Samples Analysed:	2 blacktop samples, 7 soil samples	Report issued:	24/07/2024

Signed

James Gane
Analytical Services Manager
CTS Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where further analysis is required samples identified as containing asbestos are screened and tested on an as received basis. No correction is made for moisture content and these results are not covered by our accreditation

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited, subUKAS - Subcontracted to a laboratory UKAS accredited for this test, subMCERTS - Subcontracted to a laboratory MCERTS accredited for this test

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 29.05.2024

Issued by: J. Gane

Issue No: 4

Rev No: 10



4161



7 - 11 Harding Street
Leicester
LE1 4DH

L24/06372/GIN - 24-47419

Project Reference - Amethyst Lane, Reading, RG30 2EZ 24-06-13

Analytical Test Results - Solid

Lab Reference			381320	381321	381323	381325	381326	381327
Client Sample ID			-	-	-	-	-	-
Client Sample Location			HA1	HA2	HA3	HA4	HA4	HA1
Client Sample Type			-	-	-	-	-	-
Client Sample Number			-	-	-	-	-	-
Depth - Top (m)			0.20	0.20	0.30	0.20	0.50	-
Depth - Bottom (m)			0.20	0.20	0.30	0.20	0.50	-
Date of Sampling			10/07/2024	10/07/2024	10/07/2024	10/07/2024	10/07/2024	10/07/2024
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Clay	Clay	Clay	Clay	Clay	Other
Determinant	Units	Accreditation						
Arsenic	(mg/kg)	MCERTS	< 10	< 10	140	14	220	-
Cadmium	(mg/kg)	MCERTS	0.7	0.8	1.5	0.6	2.0	-
Chromium (Total)	(mg/kg)	UKAS	5.0	2.8	7.5	9.3	13	-
Copper	(mg/kg)	MCERTS	8.4	9.9	19	10	20	-
Lead	(mg/kg)	MCERTS	32	23	120	20	130	-
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	-
Nickel	(mg/kg)	MCERTS	7.0	7.0	14	13	17	-
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	-
Zinc	(mg/kg)	MCERTS	55	72	450	59	770	-
Total Phenols	(mg/kg)	MCERTS	-	-	-	-	-	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	1.0	< 1.0	< 1.0	< 1.0	< 1.0	-
Acenaphthene	(mg/kg)	MCERTS	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 2.00
Acenaphthylene	(mg/kg)	UKAS	0.28	< 0.20	< 0.20	< 0.20	< 0.20	< 2.00
Anthracene	(mg/kg)	UKAS	< 0.20	< 0.20	< 0.20	0.27	< 0.20	< 2.00
Benzo (a) anthracene	(mg/kg)	MCERTS	3.5	0.41	0.31	0.63	< 0.20	< 2.00
Benzo (a) pyrene	(mg/kg)	MCERTS	5.0	0.37	< 0.20	0.26	< 0.20	< 2.00
Benzo (b) fluoranthene	(mg/kg)	MCERTS	8.0	0.48	0.21	0.45	< 0.20	< 2.00
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	3.6	0.29	< 0.20	< 0.20	< 0.20	< 2.00
Benzo (k) fluoranthene	(mg/kg)	MCERTS	2.4	< 0.20	< 0.20	< 0.20	< 0.20	< 2.00
Chrysene	(mg/kg)	MCERTS	3.1	0.34	0.26	0.52	< 0.20	< 2.00
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	0.95	< 0.20	< 0.20	< 0.20	< 0.20	< 2.00
Fluoranthene	(mg/kg)	MCERTS	4.1	0.78	1.6	2.6	0.37	< 2.00
Fluorene	(mg/kg)	MCERTS	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 2.00
Indeno (1, 2, 3-cd) pyrene	(mg/kg)	MCERTS	3.7	0.27	< 0.20	< 0.20	< 0.20	< 2.00
Naphthalene	(mg/kg)	MCERTS	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 2.00
Phenanthrene	(mg/kg)	MCERTS	0.35	< 0.20	< 0.20	0.48	< 0.20	< 2.00
Pyrene	(mg/kg)	MCERTS	4.1	0.64	1.4	2.6	0.49	< 2.00
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	40	5.2	6.0	9.5	3.8	< 32.00
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	-



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7 - 11 Harding Street
Leicester
LE1 4DH

L24/06372/GIN - 24-47419

Project Reference - Amethyst Lane, Reading, RG30 2EZ 24-06-13

Analytical Test Results - Solid

Lab Reference		381328	
Client Sample ID		-	
Client Sample Location		HA3	
Client Sample Type		-	
Client Sample Number		-	
Depth - Top (m)		-	
Depth - Bottom (m)		-	
Date of Sampling		10/07/2024	
Time of Sampling		-	
Sample Matrix		Other	
Determinant	Units	Accreditation	
Arsenic	(mg/kg)	MCERTS	-
Cadmium	(mg/kg)	MCERTS	-
Chromium (Total)	(mg/kg)	UKAS	-
Copper	(mg/kg)	MCERTS	-
Lead	(mg/kg)	MCERTS	-
Mercury	(mg/kg)	UKAS	-
Nickel	(mg/kg)	MCERTS	-
Selenium	(mg/kg)	u	-
Zinc	(mg/kg)	MCERTS	-
Total Phenols	(mg/kg)	MCERTS	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	-
Acenaphthene	(mg/kg)	MCERTS	< 2.00
Acenaphthylene	(mg/kg)	UKAS	< 2.00
Anthracene	(mg/kg)	UKAS	3.9
Benzo (a) anthracene	(mg/kg)	MCERTS	8.8
Benzo (a) pyrene	(mg/kg)	MCERTS	< 2.00
Benzo (b) fluoranthene	(mg/kg)	MCERTS	3.0
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	< 2.00
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 2.00
Chrysene	(mg/kg)	MCERTS	7.3
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 2.00
Fluoranthene	(mg/kg)	MCERTS	57
Fluorene	(mg/kg)	MCERTS	< 2.00
Indeno (1, 2, 3-cd) pyrene	(mg/kg)	MCERTS	< 2.00
Naphthalene	(mg/kg)	MCERTS	< 2.00
Phenanthrene	(mg/kg)	MCERTS	17
Pyrene	(mg/kg)	MCERTS	41
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	160
Asbestos	-	UKAS	-



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L24/06372/GIN - 24-47419

Project Reference - Amethyst Lane, Reading, RG30 2EZ

24-06-13

Analytical Test Results - VPH / EPH

Lab Reference			381320	381321	381322	381323	381324	381325	381326		
Client Sample ID			-	-	-	-	-	-	-		
Client Sample Location			HA1	HA2	HA2	HA3	HA3	HA4	HA4		
Client Sample Type			-	-	-	-	-	-	-		
Client Sample Number			-	-	-	-	-	-	-		
Depth - Top (m)			0.20	0.20	0.75	0.30	0.75	0.20	0.50		
Depth - Bottom (m)			0.20	0.20	0.75	0.30	0.75	0.20	0.50		
Date of Sampling			10/07/2024	10/07/2024	10/07/2024	10/07/2024	10/07/2024	10/07/2024	10/07/2024		
Time of Sampling			-	-	-	-	-	-	-		
Sample Matrix			Clay	Clay	Clay	Clay	Clay	Clay	Clay		
Determinant	Units	Accreditation									
Benzene	(mg/kg)	MCERTS	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01		
Toluene	(mg/kg)	MCERTS	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01		
Ethylbenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01		
m&p Xylene	(mg/kg)	MCERTS	< 0.02	< 0.02	-	< 0.02	-	< 0.02	< 0.02		
o-Xylene	(mg/kg)	MCERTS	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01		
MTBE	(mg/kg)	MCERTS	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01		
Total >C ₅ to C ₄₀ [EH_2D+HS_1D_Total]			(mg/kg)	u	160	81	20	190	48	580	32
Total TPH >C ₅ to C ₆ [HS_MS_1D_TOTAL]			(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total TPH >C ₆ to C ₇ [HS_MS_1D_TOTAL]			(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total TPH >C ₇ to C ₈ [HS_MS_1D_TOTAL]			(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total TPH >C ₈ to C ₁₀ [EH_2D_TOTAL]			(mg/kg)	u	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total TPH >C ₁₀ to C ₁₂ [EH_2D_TOTAL]			(mg/kg)	u	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total TPH >C ₁₂ to C ₁₆ [EH_2D_TOTAL]			(mg/kg)	u	6.7	5.8	< 5.0	< 5.0	< 5.0	68	< 5.0
Total TPH >C ₁₆ to C ₂₁ [EH_2D_TOTAL]			(mg/kg)	u	24	30	11	29	11	160	9.7
Total TPH >C ₂₁ to C ₃₅ [EH_2D_TOTAL]			(mg/kg)	u	98	35	< 10	100	29	240	16
Total TPH >C ₃₅ to C ₄₄ [EH_2D_TOTAL]			(mg/kg)	u	60	21	< 10	83	12	200	< 10



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L24/06372/GIN - 24-47419
Project Reference - Amethyst Lane, Reading, RG30 2EZ
24-06-13
Analytical Test Results - VPH / EPH
Lab Reference

Client Sample ID

Client Sample Location

Client Sample Type

Client Sample Number

Depth - Top (m)

Depth - Bottom (m)

Date of Sampling

Time of Sampling

Sample Matrix

Determinant	Units	Accreditation
Benzene	(mg/kg)	MCERTS
Toluene	(mg/kg)	MCERTS
Ethylbenzene	(mg/kg)	MCERTS
m&p Xylene	(mg/kg)	MCERTS
o-Xylene	(mg/kg)	MCERTS
MTBE	(mg/kg)	MCERTS
Total >C ₅ to C ₄₀ [EH_2D+HS_1D_TOTAL]	(mg/kg)	u
Total TPH >C ₅ to C ₆ [HS_MS_1D_TOTAL]	(mg/kg)	u
Total TPH >C ₆ to C ₇ [HS_MS_1D_TOTAL]	(mg/kg)	u
Total TPH >C ₇ to C ₈ [HS_MS_1D_TOTAL]	(mg/kg)	u
Total TPH >C ₈ to C ₁₀ [EH_2D_TOTAL]	(mg/kg)	u
Total TPH >C ₁₀ to C ₁₂ [EH_2D_TOTAL]	(mg/kg)	u
Total TPH >C ₁₂ to C ₁₆ [EH_2D_TOTAL]	(mg/kg)	u
Total TPH >C ₁₆ to C ₂₁ [EH_2D_TOTAL]	(mg/kg)	u
Total TPH >C ₂₁ to C ₃₅ [EH_2D_TOTAL]	(mg/kg)	u
Total TPH >C ₃₅ to C ₄₄ [EH_2D_TOTAL]	(mg/kg)	u

L24/06372/GIN - 24-47419

Project Reference - Amethyst Lane, Reading, RG

Analytical Test Results - VOC

Lab Reference		381322	381324
Client Sample ID		-	-
Client Sample Location		HA2	HA3
Client Sample Type		-	-
Client Sample Number		-	-
Depth - Top (m)		0.75	0.75
Depth - Bottom (m)		0.75	0.75
Date of Sampling		10/07/2024	10/07/2024
Time of Sampling		-	-
Sample Matrix		Clay	Clay
Determinant	Units	Accreditation	
Benzene	(mg/kg)	MCERTS	< 0.01
Toluene	(mg/kg)	MCERTS	< 0.01
Ethylbenzene	(mg/kg)	MCERTS	< 0.01
m&p Xylene	(mg/kg)	MCERTS	< 0.02
o-Xylene	(mg/kg)	MCERTS	< 0.01
Dichlorodifluoromethane	(mg/kg)	UKAS	< 0.05
Chloromethane	(mg/kg)	UKAS	< 0.02
Vinyl Chloride	(mg/kg)	MCERTS	< 0.02
Bromomethane	(mg/kg)	u	< 0.05
Chloroethane	(mg/kg)	MCERTS	< 0.01
Trichlorofluoromethane	(mg/kg)	MCERTS	< 0.01
1,1-Dichloroethylene	(mg/kg)	MCERTS	< 0.01
Dichloromethane	(mg/kg)	u	< 0.10
MTBE	(mg/kg)	MCERTS	< 0.01
trans-1,2,-dichloroethylene	(mg/kg)	MCERTS	< 0.01
1,1-Dichloroethane	(mg/kg)	MCERTS	< 0.01
2,2-Dichloropropane	(mg/kg)	MCERTS	< 0.01
cis-1,2,-dichloroethylene	(mg/kg)	MCERTS	< 0.01
Bromochloromethane	(mg/kg)	MCERTS	< 0.05
Chloroform	(mg/kg)	MCERTS	< 0.01
1,1,1-Trichloroethane	(mg/kg)	MCERTS	< 0.01
1,1-Dichloropropene	(mg/kg)	MCERTS	< 0.01
Carbon Tetrachloride	(mg/kg)	MCERTS	< 0.01
1,2-dichloroethane	(mg/kg)	MCERTS	< 0.02
Trichloroethylene	(mg/kg)	MCERTS	< 0.01
1,2-Dichloropropane	(mg/kg)	MCERTS	< 0.01
Dibromomethane	(mg/kg)	MCERTS	< 0.02
Bromodichloromethane	(mg/kg)	MCERTS	< 0.01
cis-1,2-dichloropropylene	(mg/kg)	MCERTS	< 0.01
trans-1,3-dichloropropylene	(mg/kg)	MCERTS	< 0.01
1,1,2-Trichloroethane	(mg/kg)	MCERTS	< 0.01
1,3-Dichloropropane	(mg/kg)	MCERTS	< 0.01
Tetrachloroethylene	(mg/kg)	MCERTS	< 0.01
Chlorodibromomethane	(mg/kg)	MCERTS	< 0.01
1,2-Dibromoethane	(mg/kg)	MCERTS	< 0.01
Chlorobenzene	(mg/kg)	MCERTS	< 0.01
1,1,1,2-tetrachloroethane	(mg/kg)	MCERTS	< 0.01
Styrene	(mg/kg)	UKAS	< 0.01
Isopropylbenzene	(mg/kg)	MCERTS	< 0.01
Bromoform	(mg/kg)	MCERTS	< 0.05
1,1,2,2-Tetrachloroethane	(mg/kg)	MCERTS	< 0.01
1,2,3-Trichloropropane	(mg/kg)	MCERTS	< 0.02
n-Propylbenzene	(mg/kg)	MCERTS	< 0.01
Bromobenzene	(mg/kg)	MCERTS	< 0.01
1,3,5-Trimethylbenzene	(mg/kg)	UKAS	< 0.01
2-chlorotoluene	(mg/kg)	MCERTS	< 0.01
4-chlorotoluene	(mg/kg)	MCERTS	< 0.01
tert-butylbenzene	(mg/kg)	UKAS	< 0.01
1,2,4-trimethylbenzene	(mg/kg)	UKAS	< 0.01
sec-Butylbenzene	(mg/kg)	UKAS	< 0.01
4-Isopropyltoluene (P-Cymene)	(mg/kg)	UKAS	< 0.01
1,3-Dichlorobenzene	(mg/kg)	u	< 0.01
1,4-Dichlorobenzene	(mg/kg)	u	< 0.01
n-Butylbenzene	(mg/kg)	UKAS	< 0.01
1,2-Dichlorobenzene	(mg/kg)	MCERTS	< 0.01
1,2-Dibromo-3-chloropropane	(mg/kg)	u	< 0.05
1,2,4-Trichlorobenzene	(mg/kg)	u	< 0.05
Hexachlorobutadiene	(mg/kg)	u	< 0.05
Naphthalene	(mg/kg)	u	< 0.05
1,2,3-Trichlorobenzene	(mg/kg)	u	< 0.05

L24/06372/GIN - 24-47419
Project Reference - Amethyst Lane, Reading,
Analytical Test Results - SVOC

Lab Reference		381322	381324
Client Sample ID		-	-
Client Sample Location		HA2	HA3
Client Sample Type		-	-
Client Sample Number		-	-
Depth - Top (m)		0.75	0.75
Depth - Bottom (m)		0.75	0.75
Date of Sampling		10/07/2024	10/07/2024
Time of Sampling		-	-
Sample Matrix		Clay	Clay
Determinant	Units	Accreditation	
1,2,4-Trichlorobenzene	(mg/kg)	u	< 0.2
1,2-Dichlorobenzene	(mg/kg)	u	< 0.1
1,3-Dichlorobenzene	(mg/kg)	u	< 0.1
1,4-Dichlorobenzene	(mg/kg)	u	< 0.2
1-Chloronaphthalene	(mg/kg)	u	< 0.1
2,3,4,6-Tetrachlorophenol	(mg/kg)	u	< 0.6
2,4,5-Trichlorophenol	(mg/kg)	u	< 0.2
2,4,6-Trichlorophenol	(mg/kg)	u	< 0.3
2,4-Dichlorophenol	(mg/kg)	u	< 0.2
2,4-Dimethylphenol	(mg/kg)	u	< 0.2
2,4-Dinitrophenol	(mg/kg)	u	< 2.0
2,6-Dichlorophenol	(mg/kg)	u	< 0.3
2,6-Dinitrotoluene	(mg/kg)	u	< 0.6
2-Chlorophenol	(mg/kg)	u	< 0.2
2-Methylnaphthalene	(mg/kg)	u	< 0.2
2-Methylphenol	(mg/kg)	u	< 0.2
2-Nitroaniline	(mg/kg)	u	< 0.4
2-Nitrophenol	(mg/kg)	u	< 0.6
3,3-Dichlorobenzidine	(mg/kg)	u	< 0.3
3/4-Methylphenol	(mg/kg)	u	< 0.2
3-Nitroaniline	(mg/kg)	u	< 0.6
4-Chlorophenyl phenyl ether	(mg/kg)	u	< 0.2
4,6-Dinitro-2-methylphenol	(mg/kg)	u	< 1.0
4-Bromophenyl phenyl ether	(mg/kg)	u	< 0.2
4-Chloro-3-methylphenol	(mg/kg)	u	< 0.2
4-Chloroaniline	(mg/kg)	u	< 0.2
4-Nitroaniline	(mg/kg)	u	< 0.3
4-Nitrophenol	(mg/kg)	u	< 0.6
Acenaphthene	(mg/kg)	u	< 0.1
Acenaphthylene	(mg/kg)	u	< 0.1
Aniline	(mg/kg)	u	< 0.2
Anthracene	(mg/kg)	u	< 0.1
Azobenzene	(mg/kg)	u	< 0.2
Benz[a]anthracene	(mg/kg)	u	< 0.1
Benzo[ghi]perylene	(mg/kg)	u	< 0.1
Benzo[a]pyrene	(mg/kg)	u	< 0.2
Benzo[b]fluoranthene	(mg/kg)	u	< 0.1
Benzo[k]fluoranthene	(mg/kg)	u	< 0.1
Benzyl Alcohol	(mg/kg)	u	< 0.3
Benzyl butyl phthalate	(mg/kg)	u	< 0.2
Bis(2-chloroethoxy)methane	(mg/kg)	u	< 0.1
Bis(2-chloroethyl)ether	(mg/kg)	u	< 0.2
Bis(2-chloroisopropyl)ether	(mg/kg)	u	< 0.2
Bis(2-ethylhexyl) phthalate	(mg/kg)	u	< 0.2
Chrysene	(mg/kg)	u	< 0.1
Dibenz[a,h]anthracene	(mg/kg)	u	< 0.2
Dibenzofuran	(mg/kg)	u	< 0.1
Dibutyl phthalate	(mg/kg)	u	< 0.1
Diethyl Phthalate	(mg/kg)	u	< 0.2
Dimethyl phthalate	(mg/kg)	u	< 0.2
Di-n-octyl phthalate	(mg/kg)	u	< 0.2
Diphenylamine	(mg/kg)	u	< 0.1
Fluoranthene	(mg/kg)	u	< 0.1
Fluorene	(mg/kg)	u	< 0.1
Hexachlorobenzene	(mg/kg)	u	< 0.3
Hexachlorobutadiene	(mg/kg)	u	< 0.3
Hexachlorocyclopentadiene	(mg/kg)	u	< 1.0
Hexachloroethane	(mg/kg)	u	< 0.2
Indeno[1,2,3-cd]pyrene	(mg/kg)	u	< 0.2
Isophorone	(mg/kg)	u	< 0.2
Methyl Methanesulfonate	(mg/kg)	u	< 0.3
Naphthalene	(mg/kg)	u	< 0.1
NitroBenzene	(mg/kg)	u	< 0.3
N-Nitrosodimethylamine	(mg/kg)	u	< 0.2
Pentachlorophenol	(mg/kg)	u	< 1.0
Phenanthrene	(mg/kg)	u	< 0.1
Phenol	(mg/kg)	u	< 0.1
Pyrene	(mg/kg)	u	< 0.1

L24/06372/GIN - 24-47419

Project Reference - Amethyst Lane, Reading, RG30 2EZ 24-06-13

Certificate Of Analysis - WAC Suite

Lab Reference			381320				
Client Sample ID	-						
Client Sample Location	HA1						
Client Sample Type	-						
Client Sample Number	-						
Depth - Top (m)	0.2						
Depth - Bottom (m)	0.2						
Date of Sampling	10/07/2024						
Time of Sampling	-						
Sample Description	Grey gravelly silty clay						
Sample Matrix	Clay						
Moisture Content (%)	4.2						
Stone content (%)	31						
			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill	
Solid Analysis							
Total Organic Carbon	%	MCERTS	1.0	3.0	5.0	6.0	
Loss on Ignition	%	UKAS	1.1	-	-	10.0	
BTEX	mg/kg	MCERTS	< 0.06	6.00	-	-	
PCB's (7 Congeners)	mg/kg	u	< 0.250	1.00	-	-	
Mineral Oil (>C10 to C40) [EH_CU_1D_Tota	mg/kg	u	1100	500	-	-	
PAH	mg/kg	u	41	100	-	-	
pH	units	MCERTS	9.0	-	> 6	-	
Eluate Analysis							
Arsenic	mg/kg	u	< 0.03	0.50	2	25	
Barium	mg/kg	u	3.00	20	100	300	
Cadmium	mg/kg	u	< 0.03	0.04	1	5	
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70	
Copper	mg/kg	u	< 0.01	2.0	50	100	
Mercury	mg/kg	u	< 0.01	0.01	0.2	2	
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30	
Nickel	mg/kg	u	< 0.03	0.4	10.0	40	
Lead	mg/kg	u	< 0.05	0.5	10.0	50	
Antimony	mg/kg	u	< 0.03	0.06	0.7	5	
Selenium	mg/kg	u	< 0.01	0.1	0.5	7	
Zinc	mg/kg	u	< 0.05	4	50	200	
Chloride	mg/kg	u	3	800	15000	25000	
Fluoride	mg/kg	u	4	10	150	500	
Sulphate (as SO ₄)	mg/kg	u	29	1000	20000	50000	
Total Dissolved Solids	mg/kg	u	380	4000	60000	100000	
Phenol Index	mg/kg	u	< 1.0	1	-	-	
Dissolved Organic Carbon	mg/kg	u	< 20	500	800	1000	

L24/06372/GIN - 24-47419

Project Reference - Amethyst Lane, Reading, RG30 2EZ 24-06-13

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
381320	-	HA1	-	-	Grey gravelly silty clay	4.2	31	100
381321	-	HA2	-	-	Grey gravelly silty clay	3.9	37	-
381322	-	HA2	-	-	Brown slightly gravelly sandy clay	13	9.2	-
381323	-	HA3	-	-	Mottled brown gravelly sandy clay	4.3	55	-
381324	-	HA3	-	-	Brown silty clay sandy clay	13	26	-
381325	-	HA4	-	-	Brown slightly gravelly sandy clay with rare rootlets	8.0	33	-
381326	-	HA4	-	-	Mottled brown slightly gravelly sandy clay	5.5	51	-
381327	-	HA1	-	-	Blacktop	U/S	U/S	-
381328	-	HA3	-	-	Blacktop	U/S	U/S	-



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L24/06372/GIN - 24-47419

Project Reference - Amethyst Lane, Reading, RG30 2EZ 24-06-13

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
381320	-	HA1	-	-	PCB18 1:10 dilution VPH/BTEX - Sample taken from container with headspace.
381321	-	HA2	-	-	PAHAR 1:10 Dilution VPH/BTEX - Sample taken from container with headspace.
381322	-	HA2	-	-	VOC - Sample taken from container with headspace. VPH/BTEX - Sample taken from container with headspace.
381323	-	HA3	-	-	PAHAR 1:10 Dilution VPH/BTEX - Sample taken from container with headspace.
381324	-	HA3	-	-	VOC - Sample taken from container with headspace. VPH/BTEX - Sample taken from container with headspace.
381325	-	HA4	-	-	TPH 1:10 Dilution PAHAR 1:10 Dilution VPH/BTEX - Sample taken from container with headspace.
381326	-	HA4	-	-	PAHAR 1:10 Dilution VPH/BTEX - Sample taken from container with headspace.
381327	-	HA1	-	-	PAHAR 1:10 Dilution
381328	-	HA3	-	-	PAHAR 1:10 Dilution

L24/06372/GIN - 24-47419

Project Reference - Amethyst Lane, Reading, RG30 2EZ 24-06-13

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
WACDOC	MS - CL - DOC (WAC)	As received	BSEN:12457 Leaching	Determination of dissolved organic carbon in a leachate as part of a WAC test
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
WACMETALS	MS - CL - ICP - Metals in Waters (WAC)	As received	BSEN:12457 Leaching	Determination of metals in a leachate as part of a WAC test via ICP
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
WACPHS	MS - CL - pH in Soils (WAC)	As received	BSEN:12457 Leaching	Determination of pH in soils as part of a WAC test via pH probe
PCB7S	MS - CL - PCB Soils	As received	Passing 10mm test sieve	Determination of PCB's (7 congeners) in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
WACANIONS	MS - CL - Anions by Aquakem (WAC)	As received	BSEN:12457 Leaching	Determination of sulphate, chloride and fluoride in a leachate as part of a WAC test using a Aquakem analyser
SVOCS	MS - CL - Semi VOC	As received	Passing 10mm test sieve	Determination of Semi volatile organic compounds in soil via GC-MS
TDSL	MS-CL-Conductivity in Water(TDS by Calc)	As received	BSEN:12457 Leaching	Determination of total dissolved solids in leachates (by calculation)
SKALARPHS	MS - CL - Phenols by Skalar	As received	Passing 10mm test sieve	Determination of total phenols in soil using Skalar segmented flow analyser
WACTOCS	MS - CL - TOC Eltra (WAC)	Air dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soil as part of a WAC test
TPHSC	MS - CL - TPH (GC-FID) Scrubbed	As received	Passing 10mm test sieve	Determination of Total Petroleum Hydrocarbons in soil using GC-FID. Sample is subjected to a fluorocil cleanup (scrubbing stage) prior to analysis
WACSKALAR	MS - CL - Phenols by Skalar (WAC)	As received	BSEN:12457 Leaching	Determination of Total Phenols within leachate as part of a WAC test using a Skalar Segmented flow analyser
GCGCS	MS - CL - TPH & EPH by GCXGC	As received	Passing 10mm test sieve	Determination of TPH and EPH in soils via GCxGC-FID
CWGS	Calculation from VPH-S and EPH-S	As received	Passing 10mm test sieve	Determination of TPH CWG (Volatile Petroleum Hydrocarbons and Extractable Petroleum Hydrocarbons) in soils via Headspace-GC-MS and GC-GC-FID respectively
VOCS	MS - CL - VOC and MBTEX	As received	Passing 10mm test sieve	Determination of VOCs (inc BTEX) in soils via Headspace-GC-MS
VPHS	MS - CL - VPH	As received	Passing 10mm test sieve	Determination of VPH in soils via Headspace-GC-MS
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
ENLEACHP	BS EN 12457-2	As Received	-	Leaching in accordance with BSEN 12457-2 (10:1 Ratio)
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377LOI	BS1377 Lol	Oven dried	Passing 2mm test sieve	Testing was in accordance with BS 1377: Part 3: 2018 + A1 :2021 Clause 6. Determination of the mass loss on ignition. Some information required by BS1377: 2016: Part 1 has not been reported. This information is available on request.

L24/06372/GIN - 24-47419

Project Reference - Amethyst Lane, Reading, RG30 2EZ 24-06-13

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
381320	-	HA1	-	-	MS - CL - pH in Soils (WAC)	R
381320	-	HA1	-	-	MS - CL - VPH	R
381321	-	HA2	-	-	MS - CL - VPH	R
381322	-	HA2	-	-	MS - CL - VOC and MBTEX	RX
381322	-	HA2	-	-	MS - CL - VPH	R
381323	-	HA3	-	-	MS - CL - VPH	R
381324	-	HA3	-	-	MS - CL - VOC and MBTEX	RX
381324	-	HA3	-	-	MS - CL - VPH	R
381325	-	HA4	-	-	MS - CL - VPH	R
381326	-	HA4	-	-	MS - CL - VPH	R



4161



7 - 11 Harding Street
Leicester
LE1 4DH

L24/06372/GIN - 24-47419

Project Reference - Amethyst Lane, Reading, RG30 2EZ 24-06-13

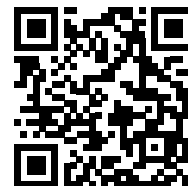
HWOL TPH Acronym Index

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics mathmatically subtracted
#2	EH_Total but with fatty acids mathmatically subtracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



UTQ6Q-LU29Z-NT497

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

Amethyst Lane, Reading, RG30 2EZ

Description/Comments

Project

24-06-13

Site

Amethyst Lane, Reading, RG30 2EZ

Classified by

Name: **Fiona White**
 Date: **12 Aug 2024 08:05 GMT**
 Telephone: **01280 816409**
 Company: **Geo-Integrity Limited**
Geo-Integrity
Unit 7
Towcester
NN12 8TA

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification

Date

05 Oct 2023

Next 3 year Refresher due by Oct 2026

Purpose of classification

7 - Disposal of Waste

Address of the waste

Amethyst Lane, Reading, RG30 2EZ

Post Code RG30 2EZ

SIC for the process giving rise to the waste

41202 Construction of domestic buildings

Description of industry/producer giving rise to the waste

Redevelopment of existing commercial site into residential

Description of the specific process, sub-process and/or activity that created the waste

waste created from excavation of foundations

Description of the waste

made ground comprising granular soil

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	HA1	0.20	Non Hazardous		3
2	HA2	0.20	Non Hazardous		6
3	HA3	0.30	Non Hazardous		8
4	HA4	0.20	Non Hazardous		10
5	HA4[2]	0.50	Non Hazardous		12

Related documents

#	Name	Description
1	WM3 v1.2 2021 compliant	waste stream template used to create this Job

Report

Created by: Fiona White

Created date: 12 Aug 2024 08:05 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	14
Appendix B: Rationale for selection of metal species	15
Appendix C: Version	15

Classification of sample: HA1

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
HA1	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.20 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				<10 mg/kg	1.32	<13.203	mg/kg	<0.00132 %		<LOD
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium sulfate }				0.7 mg/kg	1.855	1.298	mg/kg	0.00013 %	✓	
	048-009-00-9	233-331-6	10124-36-4								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				5 mg/kg	1.462	7.308	mg/kg	0.000731 %	✓	
		215-160-9	1308-38-9								
4	copper { copper sulphate pentahydrate }				8.4 mg/kg	3.929	33.004	mg/kg	0.0033 %	✓	
	029-023-00-4	231-847-6	7758-99-8								
5	mercury { mercury dichloride }				<2.5 mg/kg	1.353	<3.384	mg/kg	<0.000338 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
6	nickel { nickel chromate }				7 mg/kg	2.976	20.834	mg/kg	0.00208 %	✓	
	028-035-00-7	238-766-5	14721-18-7								
7	lead { lead chromate }			1	32 mg/kg	1.56	49.914	mg/kg	0.0032 %	✓	
	082-004-00-2	231-846-0	7758-97-6								
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8 mg/kg	1.405	<11.24	mg/kg	<0.00112 %		<LOD
	034-002-00-8										
9	zinc { zinc sulphate }				55 mg/kg	2.469	135.811	mg/kg	0.0136 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
10	chromium in chromium(VI) compounds { chromium(VI) oxide }				1 mg/kg	1.923	1.923	mg/kg	0.000192 %	✓	
	024-001-00-0	215-607-8	1333-82-0								
11	TPH (C6 to C40) petroleum group		TPH		160 mg/kg		160	mg/kg	0.016 %	✓	
12	naphthalene				<0.2 mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				0.28 mg/kg		0.28	mg/kg	0.000028 %	✓	
		205-917-1	208-96-8								
14	acenaphthene				<0.2 mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
		201-469-6	83-32-9								
15	fluorene				<0.2 mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
		201-695-5	86-73-7								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	phenanthrene	201-581-5	85-01-8		0.35 mg/kg		0.35 mg/kg	0.000035 %	✓	
17	anthracene	204-371-1	120-12-7		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
18	fluoranthene	205-912-4	206-44-0		4.1 mg/kg		4.1 mg/kg	0.00041 %	✓	
19	pyrene	204-927-3	129-00-0		4.1 mg/kg		4.1 mg/kg	0.00041 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		3.5 mg/kg		3.5 mg/kg	0.00035 %	✓	
21	chrysene	601-048-00-0	205-923-4		3.1 mg/kg		3.1 mg/kg	0.00031 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		8 mg/kg		8 mg/kg	0.0008 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		2.4 mg/kg		2.4 mg/kg	0.00024 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		5 mg/kg		5 mg/kg	0.0005 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		3.7 mg/kg		3.7 mg/kg	0.00037 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.95 mg/kg		0.95 mg/kg	0.000095 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		3.6 mg/kg		3.6 mg/kg	0.00036 %	✓	
28	PAHs (total)				40 mg/kg		40 mg/kg	0.004 %	✓	
29	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.05 %		

Key	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
<LOD	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
CLP: Note 1	Below limit of detection
	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials"
Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 2 mg/kg (0.0002%)
because: Cr(VI) not expected to be present in this sample matrix 1.0mg/kg is the reporting limit of the analytical equipment

Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00019%)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"



Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 700 mg/kg (0.07%)
because: Non-flammable, long chain hydrocarbons, no free phase liquid

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.016%)

Classification of sample: HA2

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
HA2	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.20 m	

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				<10 mg/kg	1.32	<13.203 mg/kg	<0.00132 %			<LOD
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium sulfate }				0.8 mg/kg	1.855	1.484 mg/kg	0.000148 %		✓	
	048-009-00-9	233-331-6	10124-36-4								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				2.8 mg/kg	1.462	4.092 mg/kg	0.000409 %		✓	
		215-160-9	1308-38-9								
4	copper { copper sulphate pentahydrate }				9.9 mg/kg	3.929	38.898 mg/kg	0.00389 %		✓	
	029-023-00-4	231-847-6	7758-99-8								
5	mercury { mercury dichloride }				<2.5 mg/kg	1.353	<3.384 mg/kg	<0.000338 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
6	nickel { nickel chromate }				7 mg/kg	2.976	20.834 mg/kg	0.00208 %		✓	
	028-035-00-7	238-766-5	14721-18-7								
7	lead { lead chromate }			1	23 mg/kg	1.56	35.876 mg/kg	0.0023 %		✓	
	082-004-00-2	231-846-0	7758-97-6								
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8 mg/kg	1.405	<11.24 mg/kg	<0.00112 %			<LOD
	034-002-00-8										
9	zinc { zinc sulphate }				72 mg/kg	2.469	177.789 mg/kg	0.0178 %		✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
10	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1 mg/kg	1.923	<1.923 mg/kg	<0.000192 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
11	TPH (C6 to C40) petroleum group		TPH		81 mg/kg		81 mg/kg	0.0081 %		✓	
12	naphthalene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
		205-917-1	208-96-8								
14	acenaphthene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
		201-469-6	83-32-9								
15	fluorene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
		201-695-5	86-73-7								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	phenanthrene	201-581-5	85-01-8		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
17	anthracene	204-371-1	120-12-7		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
18	fluoranthene	205-912-4	206-44-0		0.78 mg/kg		0.78 mg/kg	0.000078 %	✓	
19	pyrene	204-927-3	129-00-0		0.64 mg/kg		0.64 mg/kg	0.000064 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		0.41 mg/kg		0.41 mg/kg	0.000041 %	✓	
21	chrysene	601-048-00-0	205-923-4		0.34 mg/kg		0.34 mg/kg	0.000034 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.48 mg/kg		0.48 mg/kg	0.000048 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.37 mg/kg		0.37 mg/kg	0.000037 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.27 mg/kg		0.27 mg/kg	0.000027 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
27	benzo[ghi]perylene	205-883-8	191-24-2		0.29 mg/kg		0.29 mg/kg	0.000029 %	✓	
28	PAHs (total)				5.2 mg/kg		5.2 mg/kg	0.00052 %	✓	
29	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.0387 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 700 mg/kg (0.07%) because: Non-flammable, long chain hydrocarbons, no free phase liquid

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0081%)

Classification of sample: HA3

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
HA3	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.30 m	

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				140 mg/kg	1.32	184.846 mg/kg	0.0185 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		cadmium { cadmium sulfate }				1.5 mg/kg	1.855	2.782 mg/kg	0.000278 %	✓		
		048-009-00-9	233-331-6	10124-36-4								
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				7.5 mg/kg	1.462	10.962 mg/kg	0.0011 %	✓		
			215-160-9	1308-38-9								
4		copper { copper sulphate pentahydrate }				19 mg/kg	3.929	74.652 mg/kg	0.00747 %	✓		
		029-023-00-4	231-847-6	7758-99-8								
5		mercury { mercury dichloride }				<2.5 mg/kg	1.353	<3.384 mg/kg	<0.000338 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
6		nickel { nickel chromate }				14 mg/kg	2.976	41.668 mg/kg	0.00417 %	✓		
		028-035-00-7	238-766-5	14721-18-7								
7		lead { lead chromate }			1	120 mg/kg	1.56	187.178 mg/kg	0.012 %	✓		
		082-004-00-2	231-846-0	7758-97-6								
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8 mg/kg	1.405	<11.24 mg/kg	<0.00112 %		<LOD	
		034-002-00-8										
9		zinc { zinc sulphate }				450 mg/kg	2.469	1111.183 mg/kg	0.111 %	✓		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
10		chromium in chromium(VI) compounds { chromium(VI) oxide }				<1 mg/kg	1.923	<1.923 mg/kg	<0.000192 %		<LOD	
		024-001-00-0	215-607-8	1333-82-0								
11		TPH (C6 to C40) petroleum group				190 mg/kg		190 mg/kg	0.019 %	✓		
				TPH								
12		naphthalene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD	
		601-052-00-2	202-049-5	91-20-3								
13		acenaphthylene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD	
			205-917-1	208-96-8								
14		acenaphthene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD	
			201-469-6	83-32-9								
15		fluorene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD	
			201-695-5	86-73-7								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	phenanthrene	201-581-5	85-01-8		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
17	anthracene	204-371-1	120-12-7		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
18	fluoranthene	205-912-4	206-44-0		1.6 mg/kg		1.6 mg/kg	0.00016 %	✓	
19	pyrene	204-927-3	129-00-0		1.4 mg/kg		1.4 mg/kg	0.00014 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		0.31 mg/kg		0.31 mg/kg	0.000031 %	✓	
21	chrysene	601-048-00-0	205-923-4		0.26 mg/kg		0.26 mg/kg	0.000026 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.21 mg/kg		0.21 mg/kg	0.000021 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
27	benzo[ghi]perylene	205-883-8	191-24-2		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
28	PAHs (total)				6 mg/kg		6 mg/kg	0.0006 %	✓	
29	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.176 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: **700 mg/kg (0.07%)**
because: Non-flammable, long chain hydrocarbons, no free phase liquid

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.019%)

Classification of sample: HA4

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
HA4	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.20 m	

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				14 mg/kg	1.32	18.485	mg/kg	0.00185 %	✓	
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium sulfate }				0.6 mg/kg	1.855	1.113	mg/kg	0.000111 %	✓	
	048-009-00-9	233-331-6	10124-36-4								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.3 mg/kg	1.462	13.592	mg/kg	0.00136 %	✓	
		215-160-9	1308-38-9								
4	copper { copper sulphate pentahydrate }				10 mg/kg	3.929	39.291	mg/kg	0.00393 %	✓	
	029-023-00-4	231-847-6	7758-99-8								
5	mercury { mercury dichloride }				<2.5 mg/kg	1.353	<3.384	mg/kg	<0.000338 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
6	nickel { nickel chromate }				13 mg/kg	2.976	38.691	mg/kg	0.00387 %	✓	
	028-035-00-7	238-766-5	14721-18-7								
7	lead { lead chromate }			1	20 mg/kg	1.56	31.196	mg/kg	0.002 %	✓	
	082-004-00-2	231-846-0	7758-97-6								
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8 mg/kg	1.405	<11.24	mg/kg	<0.00112 %		<LOD
	034-002-00-8										
9	zinc { zinc sulphate }				59 mg/kg	2.469	145.688	mg/kg	0.0146 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
10	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1 mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
11	TPH (C6 to C40) petroleum group		TPH		580 mg/kg		580	mg/kg	0.058 %	✓	
12	naphthalene				<0.2 mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				<0.2 mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
		205-917-1	208-96-8								
14	acenaphthene				<0.2 mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
		201-469-6	83-32-9								
15	fluorene				<0.2 mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
		201-695-5	86-73-7								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	phenanthrene	201-581-5	85-01-8		0.48 mg/kg		0.48 mg/kg	0.000048 %	✓	
17	anthracene	204-371-1	120-12-7		0.27 mg/kg		0.27 mg/kg	0.000027 %	✓	
18	fluoranthene	205-912-4	206-44-0		2.6 mg/kg		2.6 mg/kg	0.00026 %	✓	
19	pyrene	204-927-3	129-00-0		2.6 mg/kg		2.6 mg/kg	0.00026 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		0.63 mg/kg		0.63 mg/kg	0.000063 %	✓	
21	chrysene	601-048-00-0	205-923-4		0.52 mg/kg		0.52 mg/kg	0.000052 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.45 mg/kg		0.45 mg/kg	0.000045 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.26 mg/kg		0.26 mg/kg	0.000026 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
27	benzo[ghi]perylene	205-883-8	191-24-2		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
28	PAHs (total)				9.5 mg/kg		9.5 mg/kg	0.00095 %	✓	
29	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.0892 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 700 mg/kg (0.07%) because: Non-flammable, long chain hydrocarbons, no free phase liquid

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.058%)

Classification of sample: HA4[2]

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
HA4[2]	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.50 m	

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				220 mg/kg	1.32	290.472 mg/kg	0.029 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium sulfate }				2 mg/kg	1.855	3.709 mg/kg	0.000371 %	✓		
	048-009-00-9	233-331-6	10124-36-4								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %	✓		
		215-160-9	1308-38-9								
4	copper { copper sulphate pentahydrate }				20 mg/kg	3.929	78.581 mg/kg	0.00786 %	✓		
	029-023-00-4	231-847-6	7758-99-8								
5	mercury { mercury dichloride }				<2.5 mg/kg	1.353	<3.384 mg/kg	<0.000338 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
6	nickel { nickel chromate }				17 mg/kg	2.976	50.597 mg/kg	0.00506 %	✓		
	028-035-00-7	238-766-5	14721-18-7								
7	lead { lead chromate }			1	130 mg/kg	1.56	202.776 mg/kg	0.013 %	✓		
	082-004-00-2	231-846-0	7758-97-6								
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8 mg/kg	1.405	<11.24 mg/kg	<0.00112 %			<LOD
	034-002-00-8										
9	zinc { zinc sulphate }				770 mg/kg	2.469	1901.358 mg/kg	0.19 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
10	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1 mg/kg	1.923	<1.923 mg/kg	<0.000192 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
11	TPH (C6 to C40) petroleum group		TPH		32 mg/kg		32 mg/kg	0.0032 %	✓		
12	naphthalene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
		205-917-1	208-96-8								
14	acenaphthene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
		201-469-6	83-32-9								
15	fluorene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
		201-695-5	86-73-7								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	phenanthrene	201-581-5	85-01-8		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
17	anthracene	204-371-1	120-12-7		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
18	fluoranthene	205-912-4	206-44-0		0.37 mg/kg		0.37 mg/kg	0.000037 %	✓	
19	pyrene	204-927-3	129-00-0		0.49 mg/kg		0.49 mg/kg	0.000049 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
21	chrysene	601-048-00-0	205-923-4		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
27	benzo[ghi]perylene	205-883-8	191-24-2		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
28	PAHs (total)				3.8 mg/kg		3.8 mg/kg	0.00038 %	✓	
29	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.253 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: **700 mg/kg (0.07%)** because: Non-flammable, long chain hydrocarbons, no free phase liquid

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0032%)

Appendix A: Classifier defined and non GB MCL determinands

■ chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

■ acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

■ acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

■ fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

■ anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

▪ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **PAHs (total)**

Description/Comments: Worst case scenario combining risk phrases and substance specific thresholds from benzo[a]pyrene (CLP# 601-032-00-3) and benzo[a]anthracene (CLP# 601-033-00-9)
Data source: 2008/1272/EC – Table 3.2 of Annex VI of regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures and 2009/790/EC Annex IV – Annex IV of regulation 2009/790/EC - 1st Adaptation to Technical Progress for European Regulation 1272/2008
Data source date: 16 Dec 2008
Hazard Statements: Skin Sens. 1; H317 , Carc. 1B; H350 , Carc. 1B; H350 >= 0.01 % , Muta. 1B; H340 , Aquatic Acute 1; H400 (M=100) , Aquatic Chronic 1; H410 (M=100) , Repr. 1B; H360FD

▪ **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds

cadmium {cadmium sulfate}

Worst Case Species Selected

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

(enter justification for selecting this species)

copper {copper sulphate pentahydrate}

Worst Case Species Selected

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight

lead {lead chromate}

Worst Case Species Selected

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

(enter justification for selecting this species)

zinc {zinc sulphate}

Insufficient chromium hex, next worst case

chromium in chromium(VI) compounds {chromium(VI) oxide}

(enter justification for selecting this species)

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**
HazWasteOnline Classification Engine Version: 2024.213.6193.11387 (31 Jul 2024)
HazWasteOnline Database: 2024.213.6193.11387 (31 Jul 2024)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

GB MCL List v2.0 - version 2.0 of 20th October 2023

GB MCL List v3.0 - version 3.0 of 11th January 2024

GB MCL List v4.0 - version 4.0 of 2nd March 2024

GB MCL List v5.0 - version 5.0 of 26th June 2024