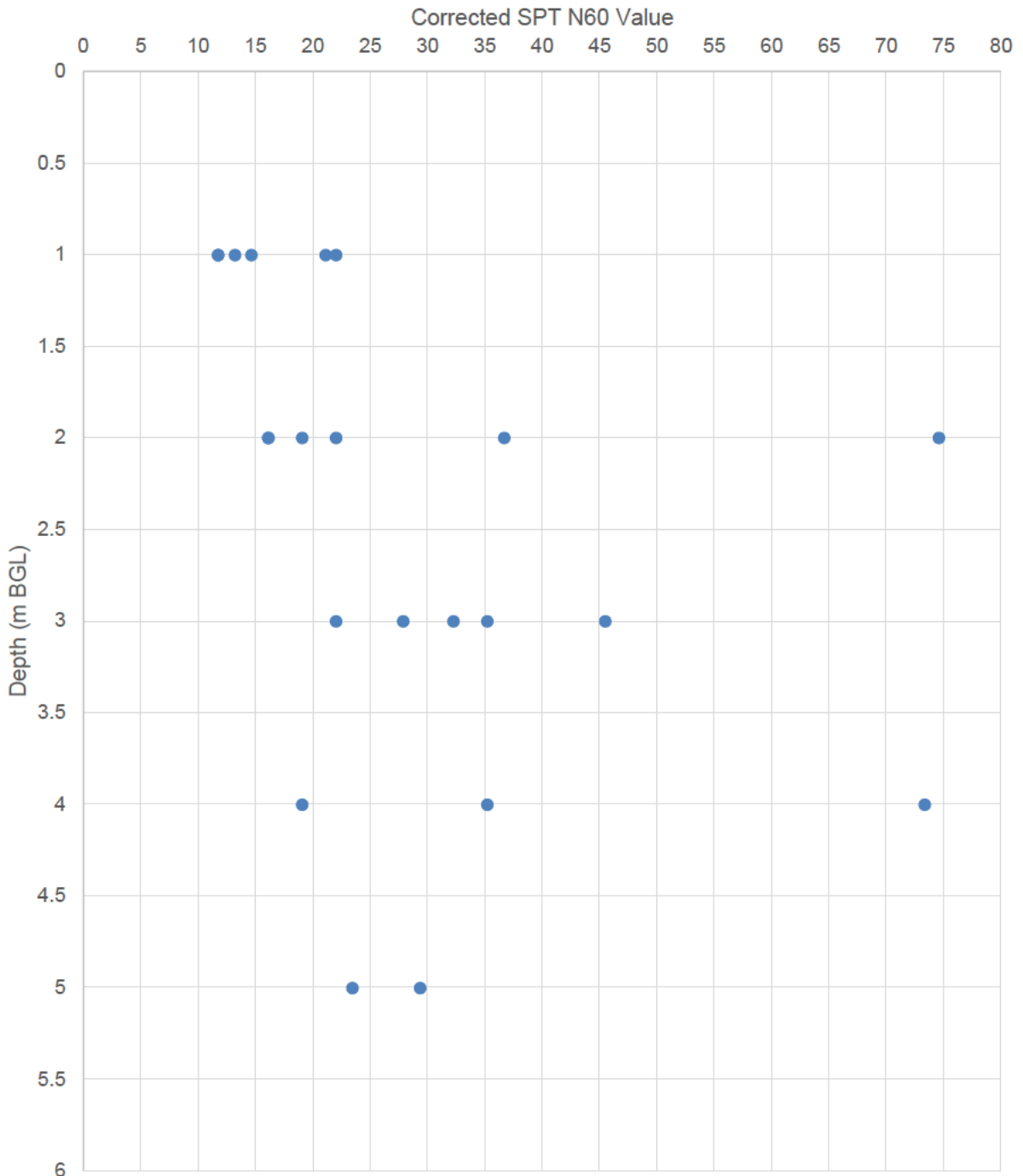


5.2 In-situ Testing

5.2.1 Standard Penetration Tests (SPTs)

In-situ SPTs were undertaken to assist with the interpretation of strata encountered. The results of corrected N-values versus depth are plotted in the graph below:



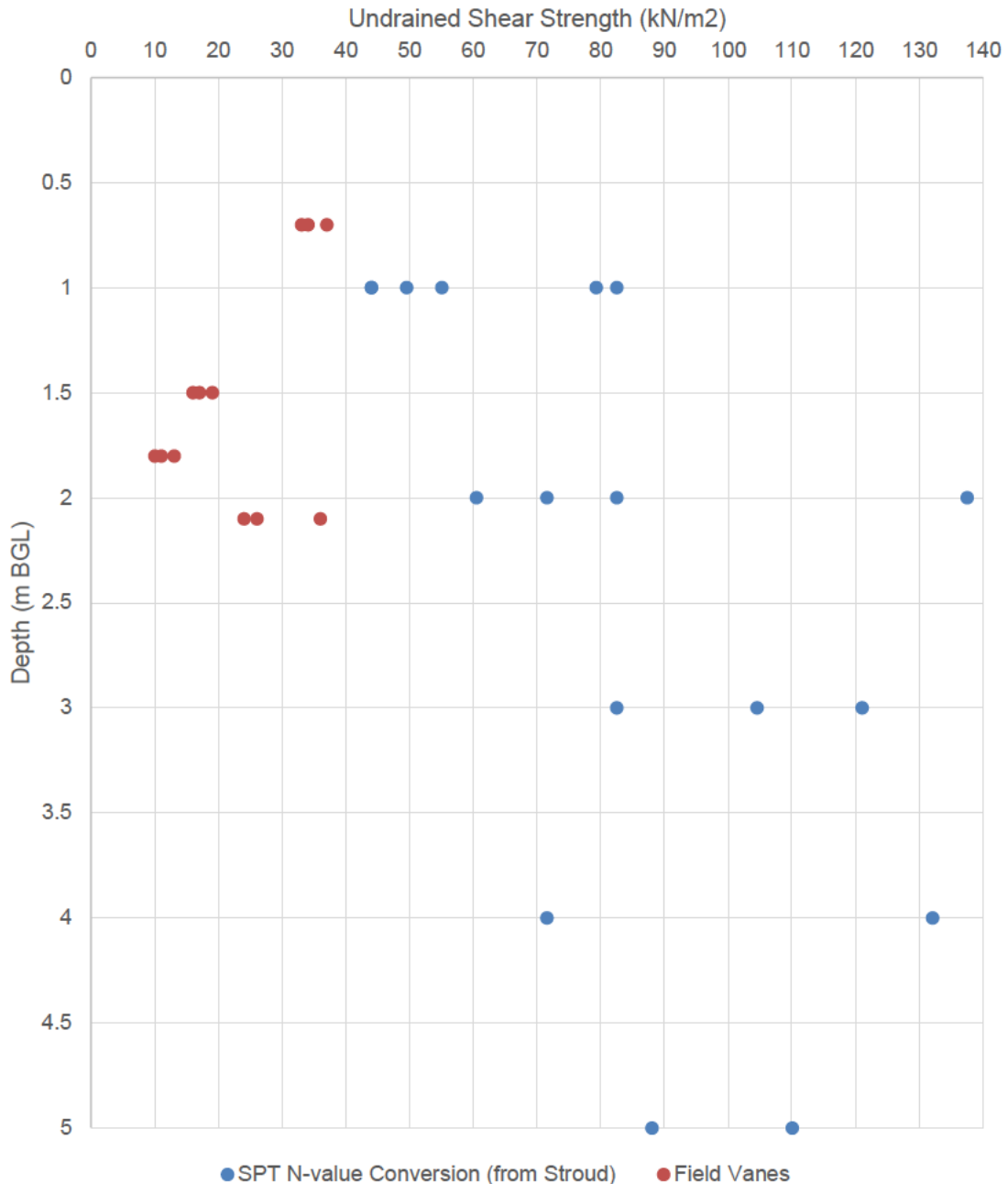
Graph 1: Plot of Corrected SPT N-Values Versus Depth

Undrained shear strengths have been estimated from SPT N values using the relationship developed by Stroud (*The standard penetration test in incentive clays and soft rocks*) and summarised in Tomlinson where:

$$\text{Mass shear strength} = f_1 \times N$$

Where f_1 is based on the plasticity index.

A Plasticity Index of 20% has been assumed (based on the average of geotechnical laboratory testing) which equates to an f_1 factor of 5.5.



Graph 2: Plot of Mass Shear Strength Versus Depth

5.2.2 Hand Shear Vane

The results of the field testing ranged between 10kPa (in TP02 at 1.8m) and 37kPa (in TP10 at 0.7m bgl). These hand shear vane results have been plotted along with the results interpreted from the SPT N values in **Graph 2**.

5.2.3 CBR Tests

The results of the eight DCP tests within the proposed road and pavement areas produced typical values between 1.6% and 17.3% within the upper 500mm.

5.2.4 Soakaway Tests

A reduction in water level from 75 to 50 % of the pit volume was not achieved within 24 hours and the three tests failed to achieve sufficient infiltration.

5.3 Soil Observations

Made Ground was encountered in one location only (WS1) containing man-made materials including brick and tile fragments locally.

There were no visible or olfactory indicators of contamination within the sampled soils.

5.4 Groundwater Observations

The natural cohesive deposits in ten (10 No) trial pits were recorded as being damp below 0.6m bgl during Remada's investigation. Groundwater was also encountered within borehole WS1 at 3.0m bgl.

5.5 Chemical Analysis

Results of the soil chemical analysis are presented in **Table 3** and summarised as follows.

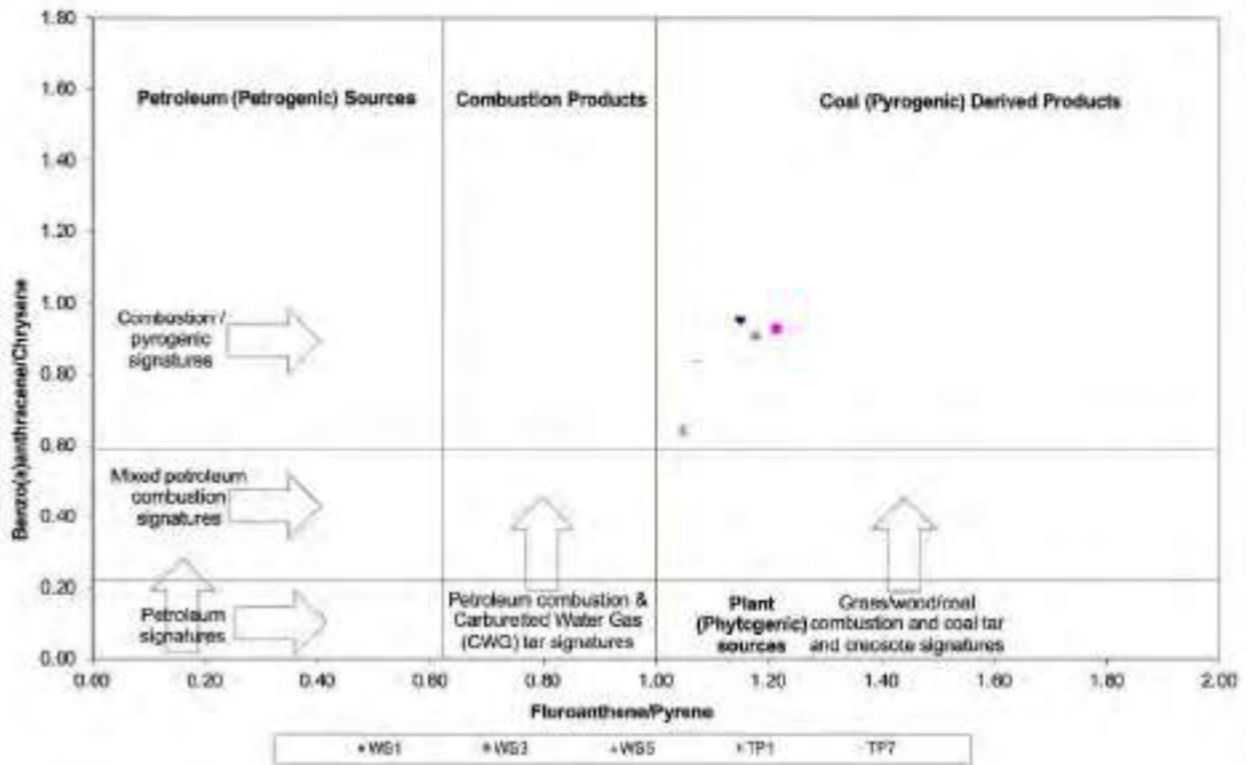
The average Fraction of Organic Carbon (FOC) and pH were 0.037 and 7.88 respectively. Asbestos was not detected in any of the eight soil samples scheduled for analysis. Detectable concentrations of metals were identified in all eight (8 No.) samples, although the majority were within the range that would typically be expected for the encountered soils.

Concentrations of Total Petroleum Hydrocarbons (TPH) were detected above the laboratory method detection limit (MDL) in the samples from WS1 at 0.2m and WS5 at 0.1m bgl. The maximum total concentration of 45mg/kg was recorded in WS1 at 0.2m. The hydrocarbons were generally heavy end within the C16 to C35 carbon range.

Concentrations of Polyaromatic Hydrocarbons (PAHs) were generally low (<5 mg/kg), with a maximum concentration of 11.5mg/kg being encountered in WS1 at 0.2m bgl.

No BTEX compounds were recorded in exceedance of MDL.

In addition, the PAH concentrations have been plotted on a double ratio plot to provide an indication of the likely source of the PAHs. All of the samples that had detections of the four PAHs used have been plotted (**Graph 3**) and all are indicated to be associated with predominantly plant (phytogenic) sources.



Graph 3: PAH Double Ratio Plot

5.6 Geotechnical Testing

Results of the geotechnical testing are summarised below.

5.6.1 Plasticity Indices

Plasticity testing was undertaken on eight (8 No.) samples of cohesive soils recovered from the window sample boreholes, with the results ranging between 18% and 37%. These indicate the soils to be Low (CL), intermediate (CI) and High (CH) plasticity and low to medium volume change potential as summarised in the table below:

Location	Depth (m)	Plasticity Index (%)	Passing .425mm (%)	Modified Plasticity Index	Volume Change Potential
TP2	1.30	18	75	13.5	Low
TP3	1.60	23	84	19.3	Low
TP4	2.10	22	87	19.1	Low
TP7	0.70	33	100	33.0	Medium
TP9	0.70	37	100	37.0	Medium
TP10	1.80	19	89	16.9	Low
TP11	1.20	20	88	17.6	Low
TP12	1.90	19	84	16.0	Low

Table 4: Plasticity Indices and Volume Change Potentials of the Natural Cohesive Strata

5.6.2 Particle Size Distribution (PSDs)

The PSD tests revealed the following:

- Natural deposits in TP4 at 2.1m comprised 'grey sandy gravelly SILT/CLAY'.
- Natural deposits in TP12 at 1.5m comprised 'grey sandy gravelly SILT/CLAY'.

5.6.3 BRE SD1 Analysis

The water-soluble sulphate contents were recorded between 11.3 and 114.0mg/l in all four samples analysed, with pH varying between 8.0 and 8.5. The total sulphur content ranged between 0.032% and 0.485%, whilst total sulphate ranged between 0.043 and 0.095%.

5.7 Ground Gas Monitoring Results

The ground gas monitoring programme is ongoing, and the full results will be summarised upon completion. However, the interim results are summarised below:

- Methane was not detected above MDL in any monitoring wells for the duration of the monitoring programme.
- A maximum steady state concentration of Carbon Dioxide was recorded as 72.3% v/v in WS1 on 8th April 2025. Detectable concentrations of carbon dioxide were recorded in all the monitoring wells;
- A minimum steady state concentration of Oxygen was recorded 17.4% v/v in WS2 on 24th April 2025.
- Ground gas flow rates were recorded at a maximum of 55.5 litres per hour (l/hr) in WS2 on 24th April 2025.
- Groundwater was encountered within all of the standpipes, ranging in depths between 0.71m and 2.6m bgl over the course of the monitoring programme.
- Atmospheric pressure at the time of sampling varied between a high of 1011 millibar (mbar) on 14th May 2025 and a low of 986 mbar on 8th April 2025.

6 GENERIC QUANTITATIVE RISK ASSESSMENT

6.1 Human Health Risk Assessment

In order to provide an up to date assessment of the risks to human health, Remada has adopted the most recent Generic Assessment Criteria (GAC) published by LQM/CIEH (S4ULs) and CL:AIRE/EIC/AGS for the assessment of potential risks to human health. The derivation of GAC, methodology, input parameters and technical guidance (CLEA) may be obtained upon request.

The proposed indicative site layout is presented in **Figure 3**.

Default parameters have been adopted for sandy loam of pH 7 and residential end use with homegrown produce. FOC ranged from 0.0058 to 0.14 giving a Soil Organic Matter (SOM) content range of between 1.0% and 24.1%, with an average result of 10.61%. In order to present a conservative assessment, the SOM content of 6% has been adopted for the assessment.

The depth to potential sources of contamination for indoor air pathways has been assumed to be 0.5m below building foundation level. The source has been conservatively assumed to be at ground level for outdoor air and direct contact pathways.

For residential land with home grown produce the CLEA version 1.06 critical receptor is conservatively modelled as a female child of age 0 to 6. In accordance with the default parameters, it was assumed that the child would spend most of their time indoors and have frequent short duration direct contact with garden soils. As such, the potential exposure pathways have been assumed to be:

- Direct soil and indoor dust ingestion.
- Consumption of home grown produce.
- Skin contact with soils and dusts.
- Inhalation of indoor and outdoor dusts and vapours.

Where GAC values for individual TPH fractions are not exceeded, the potential additive effect has been assessed by calculating overall TPH hazard index for each sample.

6.2 Comparison of Soil Analysis Results with Human Health GAC

A comparison of soil chemical analysis with GAC is presented as **Table 3**.

TPH, PAH & BTEX

None of the analytes tested were detected at concentrations that exceeded the human health GAC protective of on-site workers.

Metals & Inorganics Excluding Asbestos

None of the analytes tested were detected at concentrations that exceeded the human health GAC protective of on-site workers.

Asbestos

Asbestos was not detected in any of the samples selected for analysis.

6.3 Controlled Waters Risk Assessment

6.3.1 Sensitivity – Groundwater

The site is not indicated to be within a Groundwater Source Protection Zone. The superficial deposits are designated as Secondary Aquifer – Undifferentiated, where it is not possible to designate it as 'A' or 'B'. The Clitheroe Limestone Formation and Hodder Mudstone Formation (Undifferentiated) bedrock

underlying the site is designated as a Secondary 'B' Aquifer. There are no groundwater abstractions recorded within 1km of the site.

6.3.2 Sensitivity – Surface Waters

The nearest surface water feature is located encroaching into the northern boundary of the site, pertaining to an unnamed stream (a tributary of Mearley Brook flowing through Clitheroe). Additionally, Shaw Brook is indicated to be present adjacent to the site's southern boundary, flowing towards the north-west. There are five (5 no.) surface water abstraction points within 1000m of the site, the nearest is located 428m northwest, pertaining to Castle Castings Ltd, Additional Purpose: cooling abstraction at Mearley Brook. The license is recorded as revoked.

6.3.3 Risk Assessment

The results of the soil chemical analysis undertaken has identified that concentrations of metals and inorganic contaminants are within the range that would be expected for 'typical' natural soils. Detectable concentrations of TPH and PAHs were encountered in some samples. However, the contaminants identified are of low solubility and mobility and as such are unlikely to present a risk to groundwater beneath the site.

The ground investigation has indicated that the majority of the site is underlain by CLAY, with water being localised and perched. The only groundwater strike recorded during Remada's investigation was in WS1 at 3.0m depth. However, during the subsequent monitoring programme, groundwater was encountered within all six standpipes, ranging in depths between 0.71m and 2.60m bgl.

Consequently, the risk of leaching of contaminants as a result of infiltration of groundwater is limited. Therefore, the risk to controlled waters from contaminants within the soil at the site is considered to be low and does not warrant further consideration at this stage.

6.4 Interim Ground Gas Assessment

In order to understand the gassing regime at the site, a Characteristic Situation (as defined in CIRIA C665 and BS8576:2013) is determined for the site. CIRIA C665 and BS8576 provides definitions for each Characteristic Situation based on Gas Screening Values (GSV) which are calculated as follows:

- $GSV = \text{Gas Concentration (\% v/v)} \times \text{Measured Borehole Flow Rate (l/hr)}$

BS8576 makes a distinction between the GSV and the Hazardous Gas Flow Rate (Q_{hg}) which is also calculated using the above calculation. BS8576 states that Q_{hg} is calculated for each individual borehole for each monitoring visit, whereas the GSV is taken as the representative value for the site or site zone.

With regard to negative flow rates BS8485 states

'If a negative flow is recorded it should not automatically be discounted. Rather, an assessment of whether, under different temporal conditions, a similar positive out-flow of gas could occur should be undertaken, consistent with development of the conceptual site model. Only when the reason for the negative value is reasonably understood, and a positive flow can be credibly ruled out, should a negative value be discounted'.

As a worst case assessment, the GSV for the site is therefore taken as the maximum steady-state carbon dioxide/methane concentration recorded in the boreholes which is multiplied by the maximum flow rate recorded during the same monitoring event.

- Interim Methane GSV = 0.1 % x 55.5 l/hr = 0.0555 l/hr (methane concentration taken as equal to the instrument detection limit of 0.1%).
- Interim Carbon Dioxide GSV = 1.6 % x 55.5 l/hr = 0.888 l/hr

The calculated GSV of greater than 0.7 for methane and carbon dioxide places the site into Characteristic Situation 3. BS 8485:2015+A1:2019 states that gas protection measures should be considered for the proposed development.

For a residential building of this type (Type A) at a site classified as Characteristic Situation 3 the required minimum gas protection score for a low risk site in accordance with BS 8485:2015+A1:2019 (Table 4) is 4.5. Appropriate forms of floor and substructure designs are listed Table 5 of BS 8485:2015+A1:2019; it is likely that structural barriers, ventilation and a ground gas membrane would comprise suitable mitigation measures.

The site should be classed as CS3, however, the gas monitoring is ongoing and two of the three visits have resulted in a CS1 classification. Further monitoring is required, on completion of the programme it may be possible to zone the gas monitoring between CS1 and CS3.

6.5 Revised Conceptual Site Model

A revised Conceptual Site Model is presented as **Table 5** below.

6.6 Waste Classification & Waste Acceptance

Waste classification has been undertaken following guidance set out in WM3 EA Technical Guidance 'Guidance on the classification and assessment of waste', 1st Edition, Version 1.2GB, October 2021. The results of this assessment determine the appropriate List of Waste (LoW) Code and whether the waste should be classified as hazardous or non-hazardous. Classification is undertaken using the results of solid (total) analyses and not on the results of the WAC analyses.

Once the waste has been classified as either hazardous or non-hazardous then the WAC testing determines if the waste meets the requirements for disposal in the required landfill. Therefore, if the waste is classified as hazardous waste, then the waste would also need to meet the hazardous waste WAC requirements to be disposed of in a hazardous waste landfill. However, if the final destination of the waste is not to landfill then WAC analysis is not required.

The WAC testing also allows for a distinction to be made between inert and non-hazardous waste. Waste that does not fall within the hazardous waste category and meets the requirements for disposal in an inert landfill can therefore be disposed of in an inert landfill. However, waste that does not meet the requirements for inert landfill will need to be disposed of in a non-hazardous landfill. In certain circumstances hazardous waste can be disposed of in a designated cell within a non-hazardous landfill. In this case the waste would need to meet more stringent leachate requirements for stable non-reactive hazardous waste.

6.6.1 Waste Classification

The results of the assessment indicated that contaminant concentrations within the Made Ground, topsoil and natural soils were generally low and would generally classify the soils as non-hazardous with LoW Code 17 05 04 (soils and stones other than those mentioned in 17 05 03).

6.6.2 Waste Acceptance

Waste Acceptance Criteria (WAC) analysis was undertaken on a sample of topsoil and two samples of natural soil. The assessment of samples indicated that both samples of clay (from WS6 at 0.5m and

TP2 at 0.4m) met the requirements for disposal in an Inert landfill.

The topsoil sample from TP1 at 0.1m recorded a Total Organic Carbon (TOC) concentration of 4.6%, which would exceed the Inert Waste Landfill acceptance criteria (3%). Likewise, the Loss on Ignition concentration of 11% marginally exceeded the Hazardous Waste Landfill acceptance criteria (10%). However, it is considered likely that the site-won topsoil will be stripped during the redevelopment of the site and stockpiled for reuse as part of soft landscaping and garden areas.

6.7 Health & Safety Considerations

To ensure direct exposure of construction workers involved in the site redevelopment to any impacted contaminated shallow soils is minimised, the guidance stated in HSG 66 "Protection of Workers and the General Public During Redevelopment of Contaminated Land" should be followed.

Potential Source Areas	Potential Contaminant of Concern	Pathways	Potential Receptor	Exposure Route (Human unless otherwise stated)	Potential Identified Linkage (unmitigated)	Findings of Ground Investigation	Risk (Unmitigated)	Proposed Remediation (Mitigation) Measures	Residual Risk Estimation		
<u>On-site Sources</u>	Asbestos / Metals As, Be, Cd, Cu, Cr (VI), Cr (III) Hg, Ni, Se, Va, Zn, Boron, TPH /PAH, PCBs	Disturbance due to construction plant causing direct contact, dusts, vapours. Direct Contact with occupants of the proposed development	Occupants of the development / building fabric	• Direct Soil Ingestion	• Yes	No threshold exceedance	Very low	None required	Very low		
Agricultural Land				• Indoor Dust ingestion	• Yes	No threshold exceedance	Very low	None required	Very low		
Unspecified Tank				• Skin Contact with Soils	• Yes	No threshold exceedance	Very low	None required	Very low		
<u>Off-site Sources</u>				• Skin Contact with Dust	• Yes	No threshold exceedance	Very low	None required	Very low		
Former Cotton & Rayon Mills				• Inhalation of Outdoor Dust	• Yes	No threshold exceedance	Very low	None required	Very low		
Infilled / drained mill pond / reservoir				• Ingestion of home grown produce	• Yes	No threshold exceedance	Very low	None required	Very low		
Refuse Tip				• Inhalation of Outdoor Vapours	• Yes	No threshold exceedance	Very low	None required	Very low		
General Made Ground				• Inhalation of Indoor Vapours	• Yes	No threshold exceedance	Very low	None required	Very low		
Highmoor Farm				• Inhalation of ground gas	• Yes	CS3	High risk	Gas protection required	Low		
Residential Properties				• Inhalation of radon gas	• No	Lower Probability Area	Negligible	None	Negligible		
Electrical sub-station				Permeation of water supply pipework	Adjacent residents during construction	• Ingestion via permeated water supply pipework	• Yes	No threshold exceedance	Very low	None required	Very low
						• Direct contact with Secondary (Undifferentiated) Aquifer in Superficial Deposits	• Yes	No threshold exceedance	Very low	None required	Very low
						• In-direct contact with Secondary (B) Aquifer in bedrock	• Yes	No threshold exceedance	Very low	None required	Very low
				Leachate	Secondary Aquifers						

Table 5: Refined Conceptual Site Model

Direct contact with subsurface soil and/or groundwater during redevelopment works are not assessed as part of the CSM. It is considered that risks to workers will be managed as part of any the redevelopment works at the site through the application of health and safety procedures, where required.

7 GEOTECHNICAL SITE ASSESSMENT

7.1 Geotechnical Considerations

Made Ground was only encountered within one of the exploratory hole locations (WS1) to 0.45m bgl. Topsoil was encountered within all exploratory hole locations to depths of between 0.05m and 0.3m bgl.

Superficial Till deposits were encountered within all the exploratory holes underlying the Made Ground and/or topsoil, comprising brown locally slightly sandy slightly gravelly CLAY overlying stiff brownish grey gravelly locally very gravelly CLAY. The gravel comprised mudstone, sandstone and locally limestone.

GRAVEL deposits were encountered in WS5 from 2.0 to at least 3.5m bgl where it was not fully penetrated and in WS6 between 1.0 and 1.2m bgl, in the south-western and south-eastern areas of the site respectively.

Bedrock was not identified during the intrusive ground investigation.

The only groundwater strike recorded during Remada's investigation was in WS1 at 3m depth. However, standing water has been encountered within all six standpipes during the subsequent monitoring programme.

7.2 Preliminary Foundation Design Recommendations

It is understood that the development will comprise two-storey housing for which a line load of 25kN/m per floor is considered appropriate. Hence the estimated pressure for 0.6m wide strip footing is 83 kPa.

Based upon the window sample borehole information, the allowable bearing capacity of the firm CLAY ($C_u = 50$ kPa) beneath a strip footing of depth 1.2m and width 0.6m is estimated as 100 kPa to limit settlement to 25mm.

Foundations may need to be locally deepened where soft spots are present. A foundation schedule will be required for the proposed layout.

7.3 Shrinkage and Swelling

All samples of CLAY were reported as being LOW to HIGH plasticity with between 75% and 100% passing a 0.425mm sieve. The modified plasticity index equates at Low to Medium Volume Change Potential.

BRE 412 states that where the natural moisture content is less than 0.4 times the Liquid Limit ($w < 0.4 w_L$) it is indicative of desiccation. Soil desiccation has potentially occurred in five (5 No.) locations (TP3 at 1.6m, TP4 at 2.1m, TP7 at 0.7m, TP10 at 1.8m and TP12 at 1.9m bgl).

The minimum foundation depths outside the zone of tree influence as specified by the NHBC have been reproduced in **Table 7** below, however:

Volume Change Potential	A) Minimum foundation depth (m) (allowing for restricted new planting)	B) Minimum foundation depth (m) (where planting is outside the zone of influence of trees)
High	1.50	1.0
Medium	1.25	0.9
Low	0.9	0.75

Table 7: NHBC 2023 Table 4 Minimum Foundation Depths

7.4 Imported Fill

All imported fill material should comply with an earthworks specification to be prepared by the engineer and not contain concentrations of contaminants at greater than the Generic Assessment Criteria (GAC) presented in **Table 3**.

7.5 Excavations and Temporary Works

Based on the encountered ground conditions and observations on-site, it is considered that excavations to less than 1.2m depth from current ground level should typically stand unsupported in the short term (1 – 14 days). Excavated side slope angles in wet firm to stiff CLAY of 20 – 35 degrees are likely to be suitable, increasing to 35 – 45 degrees for dry firm to stiff CLAY, based on CIRIA Report 97 Trenching Practice. A detailed inspection of the side slopes should be made during excavation and a risk assessment carried out to fully assess the support measures required.

Groundwater is likely to be encountered as seepages within excavations. During Remada's investigation, a seepage was recorded at 3.0m bgl in WS1 only, although the resting level within all monitoring wells ranged between 0.71m and 2.6m bgl.

7.6 Highway Construction

CBR values estimated from the DCP tests indicated that, near surface the CBR values were variable with several values of between 5 and 10% recorded.

7.7 Protection of Buried Concrete

In accordance with BRE SD1 for buried concrete on a site with undisturbed ground in its natural state, and with static groundwater, analyse of selected samples for water soluble sulphate returned values of between 11.3 and 114mg/l and pH > 8.0. The characteristic values for pH and water soluble sulphate would meet the criteria for Design Sulphate Class DS-1.

Samples analysed in the three shallowest depths (in TP2, TP6 and TP10 at 1.2 – 1.6m bgl) are indicative of AC1s and DS-1. However, a total potential sulphate value of 1.45% was also calculated based on the highest total sulphur content in TP3 at 1.8m bgl. Based on this calculated Total Potential Sulphate value, Design Sulphate Class DS-4 would be considered appropriate for buried concrete and an ACEC Class of AC-3s.

It is recommended that additional BRE SD1 analysis be undertaken once the finalised foundation profile for the residential scheme is available, as this may reduce the Design Sulphate and ACEC Classes for the site.

7.8 Soakaway Drainage

Three soakaway tests were conducted within trial pits located across the site. The results indicated that there was minimal infiltration and as such soakaways will not be suitable for the proposed development.

7.9 General Construction Advice

All formations should be cleaned, and subsequently inspected, by a suitably qualified engineer prior to placing concrete. Should any soft, compressible or otherwise unsuitable materials be encountered they should be removed and replaced by blinding concrete.

Foundation concrete, or alternatively, a blinding layer of concrete, should be placed immediately after excavation and inspection in order to protect the formation against softening and disturbance.

Generally, all formations should be placed wholly within the same material type, unless specific geotechnical inspection and assessment have been undertaken.

Where applicable ground beneath the proposed building footprint and potentially car parking may require to be stripped to reveal localised areas of made ground and structures. Excavations should be backfilled with suitably re-compacted materials to achieve formation level.

During foundation excavation works arisings should be constantly monitored for the presence of contamination.

8 CONCLUSIONS & RECOMMENDATIONS

8.1 Conclusions

The following conclusions have been made based on the findings of this investigation.

8.1.1 Phase 2 Site Investigation

Made Ground was encountered in one location (WS1) to 0.45m bgl, comprising slightly clayey, slightly sandy GRAVEL. Elsewhere, topsoil was encountered to depths of between 0.05m and 0.3m bgl. Superficial Till deposits were encountered within all exploratory hole locations. The material recovered comprised brown locally slightly sandy slightly gravelly CLAY overlying stiff brownish grey gravelly locally very gravelly CLAY. The gravel comprised mudstone, sandstone and locally limestone.

GRAVEL deposits were encountered in WS5 from 2.0m to at least 3.5m bgl where it was not fully penetrated and in WS6 between 1.0 and 1.2m bgl, in the south-western and south-eastern areas of the site respectively. Bedrock was not recovered within any of Remada's exploratory locations.

8.1.2 Human Health Risk Assessment

The results of soil chemical analysis were compared to Human Health Generic Assessment Criteria for residential land use with home grown produce and none of the analytes tested were detected at concentrations that exceeded the human health GAC protective of on-site workers.

8.1.3 Water Resources Risk Assessment

The results of the soil chemical analysis undertaken has identified that concentrations of metals and inorganic contaminants are within the range that would be expected for 'typical' natural soils. Detectable concentrations of TPH and PAHs were encountered in some samples. However, the contaminants identified are of low solubility and mobility and as such are unlikely to present a risk to groundwater beneath the site.

The ground investigation has indicated that the majority of the site is underlain by CLAY, with water being localised and perched. The only groundwater strike recorded during Remada's investigation was in WS1 at 3.0m depth. However, standing water has been encountered within all six standpipes during the subsequent monitoring programme.

Consequently, the risk of leaching of contaminants as a result of infiltration of groundwater is limited. Therefore, the risk to controlled waters from contaminants within the natural soil at the site is considered to be low and does not warrant further consideration at this stage.

8.1.4 Waste Classification

Waste Acceptance Criteria (WAC) analysis was undertaken on a sample of topsoil and two samples of natural soil. The assessment of samples indicated that both samples of clay met the requirements for disposal in an Inert landfill.

The topsoil sample from TP1 at 0.1m recorded a Total Organic Carbon (TOC) concentration of 4.6%, which would exceed the Inert Waste Landfill acceptance criteria (3%). Likewise, the Loss on Ignition concentration of 11% marginally exceeded the Hazardous Waste Landfill acceptance criteria (10%). However, it is considered likely that the site-won topsoil will be stripped during the redevelopment of the site and stockpiled for reuse as part of soft landscaping and garden areas.

8.2 Recommendations

It is understood that the development will comprise two-storey housing for which a line load of 25kN/m per floor is considered appropriate. Hence the estimated pressure for 0.6m wide strip footing

is 83 kPa. Based upon the window sample borehole information, the allowable bearing capacity of the firm CLAY ($C_u = 50$ kPa) beneath a strip footing of depth 1.2m and width 0.6m is estimated as 100 kPa to limit settlement to 25mm.

Foundations may need to be locally deepened where soft spots are present. A foundation schedule will be required for the proposed layout.

All samples of CLAY were reported as being LOW, INTERMEDIATE and HIGH plasticity with between 75% and 100% passing a 0.425mm sieve. The modified plasticity index equates at Low to Medium Volume Change Potential.

Due to a Total Potential Sulphate (TPS) = 1.45%, a Design Sulphate Class DS-4 is considered appropriate for buried concrete and an ACEC Class of AC-3s is considered appropriate for the location. It is recommended that additional BRE SD1 analysis is undertaken, in order to further investigate and potentially delineate the protection requirements for buried concrete on the site possibly as part of plot scheduling.

Three soakaway tests were conducted within trial pits located across the site. The results indicated that there was minimal infiltration and as such soakaways will not be suitable for the proposed development.

Side slopes within the clay are likely to remain stable in the short term without support or without being battered back to a safe slope gradient. However, a detailed inspection of the side slopes should be made during excavation and a risk assessment carried out to fully assess the support measures

8.3 Ground Gas

The ground gas and groundwater monitoring programme is ongoing, with the results to be forwarded upon completion. However, the results of the first three (3 No.) rounds of gas monitoring place the site into gas Characteristic Situation 3 and therefore ground gas protection measures will likely be required within the proposed buildings. It may be possible to zone the site between CS1 and CS3.

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STUDY LIMITATIONS

IMPORTANT. This section should be read before reliance is placed on any of the information, opinions, advice, recommendations or conclusions contained in this report.

1. This report has been prepared by Remada, Ltd with all reasonable skill, care and diligence within the terms of the Appointment and with the resources and manpower agreed with (the 'Client'). Remada does not accept responsibility for any matters outside the agreed scope.

2. This report has been prepared for the sole benefit of the Client unless agreed otherwise in writing.

3. Unless stated otherwise, no consultations with authorities or funders or other interested third parties have been carried out. Remada is unable to give categorical assurance that the findings will be accepted by these third parties as such bodies may have published, more stringent objectives. Further work may be required by these parties.

4. All work carried out in preparing this report has used, and is based on, Remada' professional knowledge and understanding of current relevant legislation. Changes in legislation or regulatory guidance may cause the opinion or advice contained in this report to become inappropriate or incorrect. In giving opinions and advice pending changes in legislation, of which Remada is aware, have been considered. Following delivery of the report Remada has no obligation to advise the Client or any other party of such changes or their repercussions.

5. This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report.

6. Whilst this report and the opinions made are to the best of Remada' belief, Remada cannot guarantee the accuracy or completeness of any information provided by third parties.

7. This report has been prepared based on the information reasonably available during the project programme. All information relevant to the scope may not have received.

8. This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of changes in the condition of the site since the time of the investigation.

9. The content of this report represents the professional opinion of experienced environmental consultants. Remada does not provide specialist legal or other professional advice. The advice of other professionals may be required.

10. Where intrusive investigation techniques have been employed they have been designed to provide a reasonable level of assurance on the conditions. Given the discrete nature of sampling, no investigation technique is capable of identifying all conditions present in all areas. In some cases the investigation is further limited by site operations, underground obstructions and above ground structures. Unless otherwise stated, areas beyond the boundary of the site have not been investigated.

11. If below ground intrusive investigations have been conducted as part of the scope, service tracing for safe location of exploratory holes has been carried out. The location of underground services shown on any drawing in this report has been determined by visual observations and electromagnetic techniques. No guarantee can be given that all services have been identified. Additional services, structures or other below ground obstructions, not indicated on the drawing, may be present on site.

12. Unless otherwise stated the report provides no comment on the nature of building materials, operational integrity of the facility or on any regulatory compliance issues.

13. Unless otherwise stated, samples from the site (soil, groundwater, building fabric or other samples) have NOT been analysed or assessed for waste classification purposes.

TABLES

(Not presented in report body)

Table 2: Gas Groundwater Monitoring Data

GAS & GROUNDWATER MONITORING DATA																				REMADA GEO CONSULTANTS			
SITE		High Moor Park, Clitheroe																					
PROJECT No.		1134.02																					
Visit 1 of 6		Atmospheric Pressure Variations During Visit										Atmospheric & Ground Conditions								Ground Surface Conditions			
Carried Out by:		Lewis Hillman																					
Date:		08.04.2025																					
Instrument Details		Atmospheric Pressure Trend Over Previous 48hrs										Weather Conditions											
GFM436 14048		Rising										Sunny, Warm											
Well No.	Cover Height (m AOD)	Well Diameter (mm)	CH ₄ (% v/v)		CH ₄ Steady LEL (%)	CO ₂ (% v/v)		O ₂ (% v/v)		H ₂ S (ppm)		CO (ppm)		Duration (secs) ^a	Flow Rate (l/hr)	Relative Pressure (mb)	PD (ppm)		Atmospheric Pressure (mb)	Water Level (m bgl)	Water Level (m AoD)	Depth of Pipe (m bgl)	Comments
			Peak	Steady		Peak	Steady	Minimum	Steady	Minimum	Steady	Minimum	Steady				Peak	Steady					
WS1	-	50	0.0	0.0	0.0	2.3	2.3	19.2	19.6	-	-	-	-	60	0.0	0.00	-	-	1015	1.630	-	3.710	
WS2	-	50	0.0	0.0	0.0	1.7	1.4	18.3	18.5	-	-	-	-	60	2.8	0.00	-	-	1015	1.060	-	4.820	
WS3	-	50	0.0	0.0	0.0	1.7	1.5	18.2	18.2	-	-	-	-	60	0.0	0.00	-	-	1015	2.600	-	3.820	
WS4	-	50	0.0	0.0	0.0	1.5	0.7	18.9	20.1	-	-	-	-	60	0.0	0.00	-	-	1015	1.030	-	4.070	
WS5	-	50	0.0	0.0	0.0	0.8	0.6	19.9	20.0	-	-	-	-	60	8.1	0.00	-	-	1014	0.930	-	2.990	
WS6	-	50	0.0	0.0	0.0	1.2	0.8	20.3	20.3	-	-	-	-	60	0.0	0.0	-	-	1014	1.210	-	1.900	

NR = Not Recorded ^a For measurement of gas concentrations > - Above LEL WST = Water Sample Taken GL = Ground Level

GAS & GROUNDWATER MONITORING DATA																				REMADA GEO CONSULTANTS			
SITE		Highmoor Farm, Clitheroe																					
PROJECT No.		C30893																					
Visit 2 of 6		Atmospheric Pressure Variations During Visit										Atmospheric & Ground Conditions								Ground Surface Conditions			
Carried Out by:		Ben Taylor																					
Date:		24.04.25																					
Instrument Details		Atmospheric Pressure Trend Over Previous 48hrs										Weather Conditions											
GFM436 Serial number 13121		Steady										Partially cloudy, no rain, slight wind.											
Well No.	Cover Height (m AOD)	Well Diameter (mm)	CH ₄ (% v/v)		CH ₄ Steady LEL (%)	CO ₂ (% v/v)		O ₂ (% v/v)		H ₂ S (ppm)		CO (ppm)		Duration (secs) ^a	Flow Rate (l/hr)	Relative Pressure (mb)	PD (ppm)		Atmospheric Pressure (mb)	Water Level (m bgl)	Water Level (m AoD)	Depth of Pipe (m bgl)	Comments
			Peak	Steady		Peak	Steady	Minimum	Steady	Minimum	Steady	Minimum	Steady				Peak	Steady					
WS1	-	50	0.0	0.0	0.0	0.1	0.1	20.0	20.0	0.0	0.0	0.0	0.0	240	0.0	NR	-	-	1009	0.710	-	3.800	
WS2	-	50	0.0	0.0	0.0	1.3	1.3	17.4	17.4	0.0	0.0	0.0	0.0	240	55.5	NR	-	-	1009	1.040	-	4.920	
WS3	-	50	0.0	0.0	0.0	0.0	0.0	20.2	20.2	0.0	0.0	0.0	0.0	300	0.0	NR	-	-	1009	0.820	-	3.880	
WS4	-	50	0.0	0.0	0.0	0.8	0.8	19.7	19.7	0.0	0.0	10.0	10.0	240	0.0	NR	-	-	1008	1.040	-	4.160	
WS5	-	50	0.0	0.0	0.0	0.6	0.6	19.3	19.3	0.0	0.0	10.0	10.0	300	50.6	NR	-	-	1008	0.850	-	3.040	
WS6	-	50	0.0	0.0	0.0	1.6	1.6	19.2	19.2	0.0	0.0	0.0	0.0	240	-0.9	NR	-	-	1009	0.990	-	2.030	

Notes: NR = Not Recorded ^a For measurement of gas concentrations > - Above LEL WST = Water Sample Taken GL = Ground Level

GAS & GROUNDWATER MONITORING DATA																				REMADA GEO CONSULTANTS			
SITE		Highmoor Farm, Clitheroe																					
PROJECT No.		C30893																					
Visit 3 of 6		Atmospheric Pressure Variations During Visit										Atmospheric & Ground Conditions								Ground Surface Conditions			
Carried Out by:		Ben Taylor																					
Date:		14.05.2025																					
Instrument Details		Atmospheric Pressure Trend Over Previous 48hrs										Weather Conditions											
GFM436 Serial number 13121		Rising										Clear, no rain, slight wind.											
Well No.	Cover Height (m AOD)	Well Diameter (mm)	CH ₄ (% v/v)		CH ₄ Steady LEL (%)	CO ₂ (% v/v)		O ₂ (% v/v)		H ₂ S (ppm)		CO (ppm)		Duration (secs) ^a	Flow Rate (l/hr)	Relative Pressure (mb)	PD (ppm)		Atmospheric Pressure (mb)	Water Level (m bgl)	Water Level (m AoD)	Depth of Pipe (m bgl)	Comments
			Peak	Steady		Peak	Steady	Minimum	Steady	Minimum	Steady	Minimum	Steady				Peak	Steady					
WS1	-	50	0.0	0.0	0.0	0.6	0.6	20.2	20.2	0.0	0.0	0.0	0.0	240	0.0	0.00	-	-	1011	0.820	-	3.760	
WS2	-	50	0.0	0.0	0.0	0.8	0.8	18.7	18.7	0.0	0.0	0.0	0.0	240	-50.0	-120.00	-	-	1011	1.100	-	4.900	
WS3	-	50	0.0	0.0	0.0	0.4	0.4	20.2	20.2	0.0	0.0	0.0	0.0	300	0.0	0.00	-	-	1011	0.910	-	3.870	
WS4	-	50	0.0	0.0	0.0	0.8	0.8	20.1	20.1	0.0	0.0	0.0	0.0	240	-2.2	-5.00	-	-	1011	1.100	-	4.140	
WS5	-	50	0.0	0.0	0.0	0.6	0.6	19.1	19.1	0.0	0.0	10.0	0.0	300	-7.0	-16.00	-	-	1011	0.860	-	3.050	
WS6	-	50	0.0	0.0	0.0	1.0	1.0	19.8	19.8	0.0	0.0	10.0	0.0	240	-15.0	-34.00	-	-	1011	1.010	-	2.020	

Notes: NR = Not Recorded ^a For measurement of gas concentrations > - Above LEL WST = Water Sample Taken GL = Ground Level

Table 2: Gas and Groundwater Monitoring Data

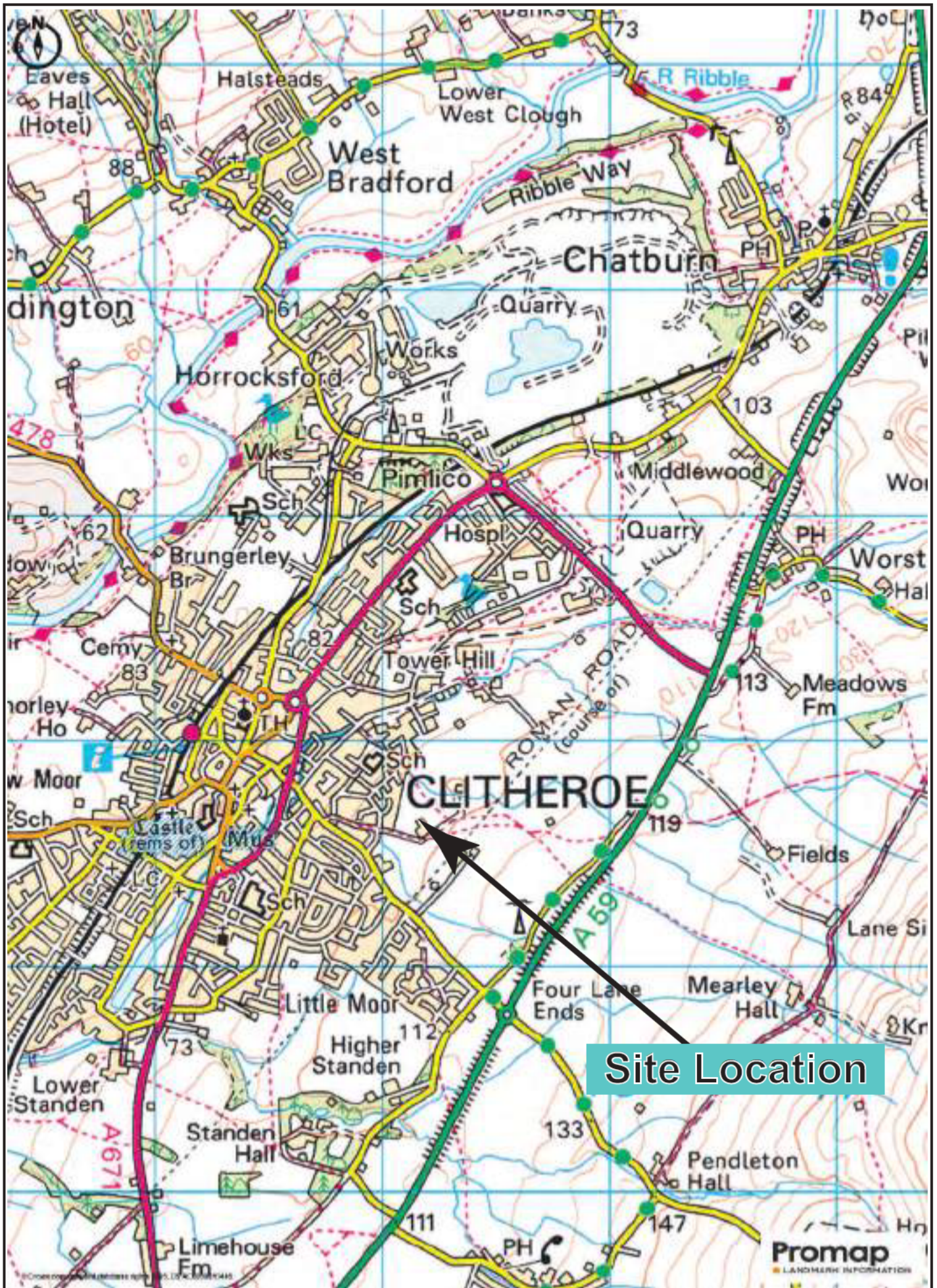
Table 3: Comparison of Soil Chemical Analyses with GAC

Lab Sample Number:				507208	507209	507210	507211	510619	510620	510621	510622
Sample Reference:				WS1	WS3	WS5	WS6	TP1	TP2	TP7	TP10
Top Depth (m):				0.2	0.1	0.1	0.5	0.1	0.4	0.2	0.4
Basal Depth (m):				-	-	-	-	-	-	-	-
Date Sampled:				02/04/2025	02/04/2025	02/04/2025	02/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Determinand	Units	Limit of detection	Accreditation Status	[mg/kg unless stated]							
Stones	%	0.01	NONE	47.4	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture	%	0.01	NONE	18	34	32	20	27	20	38	21
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos % by hand picking/weighting	%	-	-	-	-	-	-	-	-	-	-
Asbestos Containing Material Types Detected (ACM)	Type	N/A	-	-	-	-	-	-	-	-	-
pH	pH Units	N/A	MCERTS	8.6	6.6	6.5	8.1	6.3	7.7	6.5	7.2
Arsenic	mg/kg	1.00	MCERTS	37	8.4	14	15	13	13	15	12
Beryllium	mg/kg	0.06	MCERTS	1.7	0.99	1.2	1.1	1.5	0.84	1.3	1.1
Boron	mg/kg	0.20	MCERTS	290	2	2	0.6	0.7	1.2	0.6	2.7
Cadmium	mg/kg	0.20	MCERTS	11	0.8	1.2	0.7	0.6	0.8	1.2	0.8
Chromium (Hexavalent)	mg/kg	1.80	MCERTS	6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (Trivalent)	mg/kg	1.00	NONE	910	13	35	26	34	33	25	35
Chromium (aqua regia extractable)	mg/kg	1.00	MCERTS	-	14	36	27	35	34	26	37
Copper	mg/kg	1.00	MCERTS	2400	24	21	27	21	25	16	35
Lead	mg/kg	1.00	MCERTS	200	42	72	64	26	64	30	78
Mercury	mg/kg	0.30	MCERTS	1.20	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel	mg/kg	1.00	MCERTS	126	2.0	21	23	46	17	44	21
Selenium	mg/kg	1.00	MCERTS	250	< 1.0	1.3	1.3	1.2	< 1.0	1.7	< 1.0
Vanadium	mg/kg	1.00	MCERTS	410	23	54	42	43	50	33	56
Zinc	mg/kg	1.00	MCERTS	3700	120	140	130	85	130	150	170
Total Cyanide	mg/kg	1.00	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	0.027	0.044	0.036	0.0086	0.046	0.0092	0.11
Calculated TOC from FOC	-	-	-	-	2.70	4.40	3.60	0.86	4.60	0.92	11.00
Calculated SOM from FOC	-	-	-	-	4.66	7.59	6.21	1.48	7.93	1.59	18.97
Aliphatic TPH >C5-C6	mg/kg	0.01	NONE	160	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C6-C8	mg/kg	0.01	NONE	530	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C8-C10	mg/kg	0.01	NONE	150	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C10-C12	mg/kg	1.00	MCERTS	760vap (283)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	mg/kg	2.00	MCERTS	4300sol (142)	2	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic TPH >C16-C21	mg/kg	8.00	MCERTS	110000	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Aliphatic TPH >C21-C35	mg/kg	8.00	MCERTS	-	11	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Total Aliphatic Hydrocarbons:	mg/kg	10.00	NONE	-	13	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic TPH >C5-C7	mg/kg	0.01	NONE	300	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aromatic TPH >C7-C8	mg/kg	0.01	NONE	680	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aromatic TPH >C8-C10	mg/kg	0.02	NONE	190	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Aromatic TPH >C10-C12	mg/kg	1.00	MCERTS	380	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	mg/kg	2.00	MCERTS	660	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic TPH >C16-C21	mg/kg	10.00	MCERTS	930	11	< 10	11	< 10	< 10	< 10	< 10
Aromatic TPH >C21-C35	mg/kg	10.00	MCERTS	1700	21	< 10	14	< 10	< 10	< 10	< 10
Total Aromatic Hydrocarbons	mg/kg	10.00	NONE	-	32	< 10	25	< 10	< 10	< 10	< 10
Calculated Sum TPH (sum Aliphatic + sum Aromatic)	-	-	-	-	45	< 20	< 35	< 20	< 20	< 20	< 20
Naphthalene	mg/kg	0.05	MCERTS	13	0.1	0.06	0.08	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	920	0.22	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	1100	0.07	0.11	0.45	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	860	0.18	0.08	0.29	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	440	2.2	0.86	3.4	< 0.05	0.19	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	11000	0.59	0.16	0.73	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	890	4.6	1.7	5.3	< 0.05	0.44	< 0.05	0.73
Pyrene	mg/kg	0.05	MCERTS	2000	4	1.4	4.5	< 0.05	0.42	< 0.05	0.68
Benzo[a]anthracene	mg/kg	0.05	MCERTS	13	2	0.74	2.1	< 0.05	0.18	< 0.05	0.35
Chrysene	mg/kg	0.05	MCERTS	27	2.1	0.8	2.3	< 0.05	0.28	< 0.05	0.42
Benzo[b]fluoranthene	mg/kg	0.05	ISO 17025	3.7	2.5	0.89	2.4	< 0.05	0.33	< 0.05	0.55
Benzo[k]fluoranthene	mg/kg	0.05	ISO 17025	100	1.1	0.43	1	< 0.05	0.12	< 0.05	0.26
Benzo[a]pyrene	mg/kg	0.05	MCERTS	3	2.3	0.83	2.2	< 0.05	0.23	< 0.05	0.49
Indeno[1,2,3-c,d]Pyrene	mg/kg	0.05	MCERTS	41	1.1	0.38	1	< 0.05	0.12	< 0.05	0.22
Dibenzo[a,h]Anthracene	mg/kg	0.05	MCERTS	0.3	0.29	0.11	0.27	< 0.05	< 0.05	< 0.05	< 0.05
Benzo[g,h,i]perylene	mg/kg	0.05	MCERTS	350	1.2	0.4	1.1	< 0.05	0.15	< 0.05	0.25
Total of 16 PAHs	mg/kg	0.8	ISO 17025	-	11.5	< 0.80	3.25	6.92	2.44	< 0.80	4.23
Benzene	ug/kg	5.00	MCERTS	0.37*	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	ug/kg	5.00	MCERTS	660*	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	ug/kg	5.00	MCERTS	260*	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	ug/kg	8.00	MCERTS	310*	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
o-xylene	ug/kg	5.00	MCERTS	330*	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	5.00	NONE	160	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Phenols	mg/kg	1.00	MCERTS	380	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.1	< 1.0

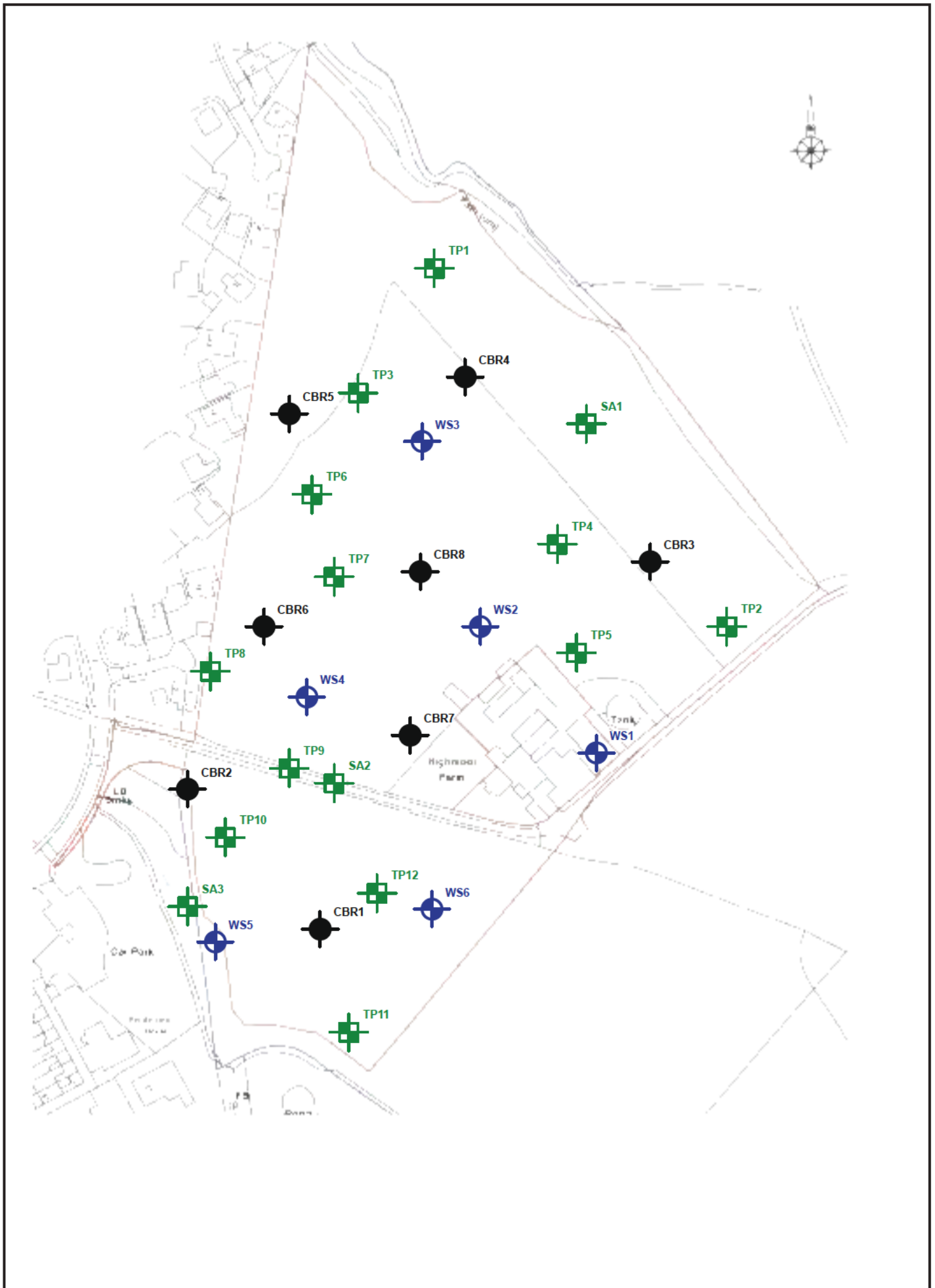
 Determinand concentration below the GAC
 Determinand concentration in exceedance of GAC
 Determinand concentration in exceedance of the vapour/solubility saturation limit.

NC: No published criteria. U.S. Unsuitable sample.
 vap: Screening criteria presented exceed the vapour saturation limit, which is presented in brackets.
 sol: Screening criteria presented exceed the solubility saturation limit, which is presented in brackets.
 dr: Screening criteria based on threshold protective of direct skin contact (guideline in brackets based on health effects following long term exposure provided for illustration only).
 (1): For assessment based on the use of the surrogate marker approach the GAC for Coal Tar must be used instead of benz[a]pyrene.
 * Value presented in mg/kg

FIGURES



Notes	Revision	Approved	Date	Project Title	Scale	Drawn	Size
				Highmoor Farm, Clitheroe	as shown	PD	A4
				Drawing Title	Date	Job No.	Figure No.
				Site Location Plan	24.01.25	1134	01
			Client				
			Vernon & Co.				



Notes The proposed site layout plan has been reproduced from drawing 'Proposed Development of Land at Highmoor Farm Clitheroe' by Gary Hoerty Associates, drawing No. VHLP/778/2576/02 dated July 2020.	Revision	Approved	Date	Project Title	Scale	Drawn	Size
				Highmoor Farm, Clitheroe	as shown	LH	A4
				Exploratory Hole Location Plan	Date	Job No.	Figure No.
				Client	19.05.25	1134	03
			Vernon & Co.				

EXPLORATORY HOLE LOGS

Percussion Drilling Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 02/04/2025	
Location:		Contractor:		Co-ords: E375220.00 N441586.00	
Project No. : 1134.02		Crew Name:		Drilling Equipment: Tracked rig	
Borehole Number WS1	Hole Type WS	Level	Logged By KS	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.05		Grass over dark brown gravelly clayey TOPSOIL. Gravel is subangular to subrounded fine to coarse sandstone.		
					0.45		MADE GROUND: Brown and reddish brown slightly clayey slightly sandy angular to subrounded fine to coarse gravel of sandstone, mudstone, tile and rare brick fragments.		
		1.00	SPT	N=8 (3,2/1,2,2,3)				Firm to stiff brown slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse limestone, sandstone and mudstone with rare subrounded limestone cobbles.	1
		1.50	D						
		2.00	SPT	N=25 (3,3/5,6,7,7)	1.90			Stiff dark brownish grey gravelly to very gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone.	2
		3.00	SPT	N=31 (7,6/7,9,7,8)					3
	4.00	SPT	N=50 (6,7/50 for 295mm)	4.00			End of Borehole at 4.000m	4	
								5	
								6	
								7	
								8	
								9	
								10	

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

- Groundwater encountered at 3.0m bgl.
- Gas and groundwater monitoring well installed on completion.
- Terminated due to SPT refusal (N>50).



Percussion Drilling Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 02/04/2025	
Location:		Contractor:		Co-ords: E375160.00 N441628.00	
Project No. : 1134.02		Crew Name:		Drilling Equipment: Tracked rig	
Borehole Number WS2	Hole Type WS	Level	Logged By KS	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30		Grass over dark brown clayey TOPSOIL with rootlets.		
					0.80		Firm light brown slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone.		
	1.00	SPT	N=9 (1,2/2,2,2,3)				Firm dark brownish grey slightly sandy slightly gravelly CLAY. Gravel is angular to rounded fine to coarse mudstone.	1	
	1.20	D					<i>Locally soft between 0.8 and 1.0m bgl.</i>		
	2.00	SPT	N=15 (2,4/1,4,4,6)		2.10		Stiff dark brownish grey gravelly to very gravelly CLAY. Gravel is angular to rounded fine to coarse mudstone.	2	
	2.20	D							
					3.00			3	
					4.00			4	
					5.00			5	
							End of Borehole at 5.000m	5	
								6	
								7	
								8	
								9	
								10	

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

- Groundwater not encountered.
- Gas and groundwater monitoring well installed on completion.



Percussion Drilling Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 02/04/2025	
Location:		Contractor:		Co-ords: E375157.00 N441694.00	
Project No. : 1134.02		Crew Name:		Drilling Equipment: Tracked rig	
Borehole Number WS3	Hole Type WS	Level	Logged By KS	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	D		0.30		Grass over dark brown clayey TOPSOIL with rootlets.		
		1.00	SPT	N=11 (1,1/11 for 295mm)			Firm brown and light brown slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse sandstone and mudstone.	1	
		1.20	D				<i>Locally soft between 0.8 and 1.0m bgl.</i>		
		2.00	SPT	N=13 (2,2/2,3,4,4)	1.70		Stiff dark brownish grey gravelly to very gravelly CLAY. Gravel is angular to rounded fine to coarse mudstone.	2	
		3.00	SPT	N=22 (3,4/4,6,6,6)				3	
		4.00	SPT	N=50 (8,6/5,14,14,17)	4.00		End of Borehole at 4.000m	4	
								5	
								6	
								7	
								8	
								9	
								10	

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

- Groundwater not encountered.
- Gas and groundwater monitoring well installed on completion.
- Terminated due to SPT refusal (N>50).



Percussion Drilling Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 02/04/2025	
Location:		Contractor:		Co-ords: E375100.00 N441611.00	
Project No. : 1134.02		Crew Name:		Drilling Equipment: Tracked rig	
Borehole Number WS4	Hole Type WS	Level	Logged By KS	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20		Grass over dark brown clayey TOPSOIL with rootlets.		
		0.80 - 2.30	B		0.80		Firm brown and light brown slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse sandstone and mudstone.	1	
		1.00	SPT	N=8 (1,1/2,2,2,2)			Soft becoming firm dark brownish grey slightly to gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone.	2	
		2.00	SPT	N=11 (5,2/2,2,3,4)	2.30		Stiff dark brownish grey gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone.	3	
		3.00	SPT	N=15 (3,3/3,3,4,5)				4	
		4.00	SPT	N=13 (2,2/2,3,4,4)	5.00		End of Borehole at 5.000m	5	
	5.00	SPT	N=16 (3,3/3,3,4,6)				6		
								7	
								8	
								9	
								10	

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
 1. Groundwater not encountered.
 2. Gas and groundwater monitoring well installed on completion.



Percussion Drilling Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 02/04/2025	
Location:		Contractor:		Co-ords: E375059.00 N441487.00	
Project No. : 1134.02		Crew Name:		Drilling Equipment: Tracked rig	
Borehole Number WS5	Hole Type WS	Level	Logged By KS	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.25		Grass over dark brown clayey TOPSOIL with rootlets.		
		1.00	SPT	N=10 (1,1/2,3,2,3)	1.00		Firm brown and light brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse mudstone. <i>Locally soft between 0.65 and 0.85m bgl.</i>	1	
		2.00 2.10	SPT D	N=11 (2,3/2,2,3,4)	1.90		Stiff dark brownish grey gravelly to very gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone and sandstone with rare subrounded mudstone cobbles.	2	
		3.00	SPT	N=24 (11,7/5,6,7,6)			Dark brownish grey sandy very clayey angular to subrounded fine to coarse GRAVEL of mudstone.	3	
		3.50	SPT	N=50 (25 for 75mm/50 for 50mm)	3.50		End of Borehole at 3.500m	4	
								5	
								6	
								7	
								8	
								9	
								10	

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

- Groundwater not encountered.
- Gas and groundwater monitoring well installed on completion.
- Terminated due to SPT refusal (N>50).



Percussion Drilling Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 02/04/2025	
Location:		Contractor:		Co-ords: E375145.00 N441498.00	
Project No. : 1134.02		Crew Name:		Drilling Equipment: Tracked rig	
Borehole Number WS6	Hole Type WS	Level	Logged By	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
WS6		0.25			0.25		Grass over dark brown clayey TOPSOIL with rootlets.		
		0.50	D				Firm brown and light brown CLAY.		
		1.00	SPT	N=15 (1,1/4,4,3,4)	1.00		Soft dark grey sandy clayey angular to subrounded fine to coarse GRAVEL of mudstone.	1	
		1.20	B		1.20		Stiff dark brownish grey gravelly locally sandy CLAY. Gravel is angular to subrounded fine to coarse mudstone.		
		2.00	SPT	N=50 (4,7/50 for 295mm)	2.00		End of Borehole at 2.000m	2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

- Groundwater not encountered.
- Gas and groundwater monitoring well installed on completion.
- Terminated due to SPT refusal (N>50).



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 10/04/2025	
Location:		Contractor:		Co-ords: E375207.00 N441696.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number SA1	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
Well	Water Strikes				0.30			Grass over brown slightly clayey sandy TOPSOIL.	
								Firm light brown sandy CLAY.	
					1.00			Soft grey slightly sandy gravelly CLAY. Gravel is subangular to rounded fine to coarse mudstone (wet).	1
					1.40			End of Borehole at 1.400m	2
								3	
								4	
								5	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks

1. Trial pit utilised as a soakaway; see separate sheet for details.
2. Groundwater not encountered.
3. Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 10/04/2025	
Location:		Contractor:		Co-ords: E375115.00 N441571.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number SA2	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
[Pattern]					0.25		[Pattern]	Grass over brown slightly clayey sandy TOPSOIL.	
					0.70		[Pattern]	Firm light brown very sandy CLAY.	
					1.50		[Pattern]	Soft grey slightly sandy gravelly CLAY. Gravel is subangular to rounded fine to coarse mudstone (wet).	1
							End of Borehole at 1.500m		2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks

1. Trial pit utilised as a soakaway; see separate sheet for details.
2. Groundwater not encountered.
3. Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 10/04/2025	
Location:		Contractor:		Co-ords: E375060.00 N441509.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number SA3	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
[Pattern]					0.25		[Pattern]	Grass over brown slightly clayey sandy TOPSOIL.	
					0.80		[Pattern]	Firm to stiff light brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse mudstone.	
					1.35		[Pattern]	Soft brownish grey slightly sandy gravelly clay. Gravel is subangular to rounded fine to coarse mudstone (wet).	1
								End of Borehole at 1.350m	2
								3	
								4	
								5	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks

- Trial pit utilised as a soakaway; see separate sheet for details.
- Groundwater not encountered.
- Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 09/04/2025	
Location:		Contractor:		Co-ords: E375151.00 N441761.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number TP01	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
[Pattern]		0.10	ES		0.20		[Pattern]	Grass over brown slightly clayey sandy TOPSOIL.	
					0.80		[Pattern]	Firm Light brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium mudstone.	
		0.70	D		2.10		[Pattern]	Soft brownish grey slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone with rare boulders up to 30cm (wet).	1
							End of Borehole at 2.100m	2	
								3	
								4	
								5	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks
 1. Groundwater not encountered, however, some material recovered wet.
 2. Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 09/04/2025	
Location:		Contractor:		Co-ords: E375268.00 N441626.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number TP02	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.25			Grass over brown slightly clayey sandy TOPSOIL.	
		0.40	ES					Soft to firm brownish grey slightly sandy slightly gravelly CLAY. Gravel is angular to rounded fine to coarse mudstone.	1
		1.00	B						
		1.20	D						
		1.30	D						
		1.50						Soft to firm brownish grey slightly silty sandy gravelly CLAY. Gravel is angular to rounded fine to coarse mudstone with rare boulders up to 20cm.	
		1.80	D	HVP=10 HVP=11 HVP=13	1.90		End of Borehole at 1.900m	2	
		1.80							
		1.80							
		1.80							
								3	
								4	
								5	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks

- Groundwater not encountered.
- Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 09/04/2025	
Location:		Contractor:		Co-ords: E375120.00 N441712.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number TP03	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
[Pattern]					0.30		Grass over brown slightly clayey sand TOPSOIL.		
					0.60		Firm to stiff orangish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to medium mudstone.		
							Soft grey slightly sandy very gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone (wet).	1	
							<u>Rare slate cobbles.</u>		
		1.60	D						
		1.80	D						
					2.10		End of Borehole at 2.100m	2	
								3	
								4	
								5	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks

1. Groundwater not encountered, however, some material recovered wet.
2. Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 09/04/2025	
Location:		Contractor:		Co-ords: E375195.00 N441656.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number TP04	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
			B	HVP=24 HVP=26 HVP=36	0.25			Grass over brown slightly clayey sandy TOPSOIL.	
					0.85			Firm orangish brown slightly gravelly slightly sandy CLAY. Gravel is angular to subangular fine to medium mudstone.	
					1.30			Soft brownish grey slightly sandy gravelly CLAY. Gravel is angular to rounded fine to coarse mudstone (wet).	1
					2.10			Soft to firm brownish grey slightly sandy very gravelly CLAY. Gravel is angular to subrounded fine to coarse with frequent boulders up to 35cm.	
					2.10			<i>Wet material</i>	2
		2.10 2.10 2.10			2.10		End of Borehole at 2.100m		
								3	
								4	
								5	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks
 1. Groundwater not encountered, however, some material recovered wet.
 2. Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 09/04/2025	
Location:		Contractor:		Co-ords: E375211.00 N441608.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number TP05	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
[Pattern]					0.30		[Pattern]	Grass over brown slightly clayey sandy TOPSOIL.	1
					0.70		[Pattern]	Firm orange brown slightly sandy CLAY with rare rounded fine to coarse mudstone gravel.	
					2.00		[Pattern]	Soft greyish brown slightly silty slightly sandy gravelly CLAY. Gravel is angular to rounded fine to coarse with rare cobbles up to 30cm.	
		2.00	D		2.00			End of Borehole at 2.000m	2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks

- Groundwater not encountered.
- Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 09/04/2025	
Location:		Contractor:		Co-ords: E375100.00 N441670.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number TP06	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30			Grass over brown clayey sandy TOPSOIL.	
					0.80	D		Firm light brownish grey sandy CLAY.	
					1.00			Soft light grey slightly sandy gravelly CLAY. Gravel is subangular to rounded fine to coarse mudstone (wet).	1
					1.60	D		Soft grey slightly silty slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse mudstone (wet).	
				2.00			End of Borehole at 2.000m	2	
								3	
								4	
								5	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks
 1. Groundwater not encountered, however, some material recovered wet.
 2. Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 09/04/2025	
Location:		Contractor:		Co-ords: E375112.00 N441621.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number TP07	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
[Pattern]		0.20	ES		0.30		[Pattern]	Brown slightly clayey sandy TOPSOIL.	
					0.65		[Pattern]	Firm light brown slightly gravelly slightly sandy CLAY. Gravel is subangular to rounded fine to coarse mudstone.	
		0.70	B		1.30		[Pattern]	Soft grey slightly sandy gravelly CLAY. Gravel is angular to subangular fine to coarse mudstone with rare boulders up to 25cm.	1
					1.70		[Pattern]	Soft grey slightly silty slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone with rare boulders up to 40cm (wet).	
					2.10		[Pattern]	Firm grey slightly sandy very gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone with cobbles.	2
							End of Borehole at 2.100m	3	
								4	
								5	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks

1. Groundwater not encountered, however, some material recovered wet.
2. Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 09/04/2025	
Location:		Contractor:		Co-ords: E375065.00 N441608.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number TP08	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
[Pattern]					0.20		[Pattern]	Grass over brown slightly clayey sandy TOPSOIL.	
					0.45		[Pattern]	Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium mudstone.	
					1.80		[Pattern]	Soft brownish grey slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone with frequent cobbles.	1
					1.80		End of Borehole at 1.800m	2	
								3	
								4	
								5	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks

1. Groundwater not encountered.
2. Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 09/04/2025	
Location:		Contractor:		Co-ords: E375093.00 N441572.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number TP09	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
[Pattern]		0.70	ES		0.20		[Pattern]	Brown slightly clayey sandy TOPSOIL.	1
					0.85		[Pattern]	Light brown very clayey SAND.	
					1.75		[Pattern]	Brownish grey slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone with rare boulders up to 40cm. <i>Localised coarse gravel sized pockets of light brown SAND.</i>	
					End of Borehole at 1.750m		[Pattern]		

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks
 1. Groundwater not encountered.
 2. Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 10/04/2025	
Location:		Contractor:		Co-ords: E375085.00 N441529.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number TP10	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.25			Grass over brown clayey sandy TOPSOIL.		
		0.40	ES					Firm light brown slightly silty slightly sandy CLAY.		
		0.70	B	HVP=33						
		0.70		HVP=34		0.90			Soft to firm brownish grey slightly sandy very gravelly CLAY. Gravel is subangular to rounded fine to coarse mudstone, with cobbles up to 20cm.	1
		0.70		HVP=37						
		1.40	D		1.70			<i>Recovered material wet from 1.45m.</i>		
		1.80	D		1.90			Soft to firm grey slightly gravelly clayey SILT. Gravel is subangular to subrounded fine to coarse mudstone.		
								End of Borehole at 1.900m	2	
									3	
									4	
									5	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks
 1. Groundwater not encountered.
 2. Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 10/04/2025	
Location:		Contractor:		Co-ords: E375123.00 N441460.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number TP11	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
[Pattern]		0.25	ES		0.30		[Pattern]	Grass over brown clayey sand TOPSOIL.	
					0.60		[Pattern]	Firm light orangish brown slightly gravelly very sandy CLAY. Gravel is subangular to subrounded fine to coarse mudstone.	
					1.10		[Pattern]	Soft to firm light brown slightly gravelly sandy CLAY. Gravel is subangular to rounded fine to coarse mudstone.	1
		1.20	D		1.80		[Pattern]	Soft grey slightly sandy very gravelly CLAY. Gravel is angular to rounded fine to coarse mudstone and slate with rare boulders up to 25cm (wet).	
		1.80	D		2.00			End of Borehole at 2.000m	2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks

- Groundwater not encountered, however, some material recovered wet.
- Backfilled with arisings on completion.



Trial Pit Log

Project Name: High Moor Farm, Clitheroe		Client: VH Land Partnerships Limited		Date: 10/04/2025	
Location:		Contractor:		Co-ords: E375127.00 N441505.00	
Project No. : 1134.02		Crew Name:		Equipment: 1.7 Tonne Tracked Excavator	
Location Number TP12	Location Type TP	Level	Logged By LH	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
[Pattern]					0.25		Grass over brown slightly clayey sandy TOPSOIL.		
					0.70		Light brown slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse mudstone.		
							Soft grey slightly sandy very gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone.	1	
		1.50 1.50 1.50 1.50	B	HVP=16 HVP=17 HVP=19					
		1.90	D		1.90		End of Borehole at 1.900m	2	
								3	
								4	
								5	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
		Pit sides stable.					

Remarks

- Groundwater not encountered.
- Backfilled with arisings on completion.



APPENDIX A

SPT Hammer Energy Test Certificate



SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Socotec uk
Progress close
Binley
Coventry
CV3 2TF

SPT Hammer Ref: 110.24
Test Date: 30/01/2025
Report Date: 30/01/2025
File Name: 110.24.spt
Test Operator: DP

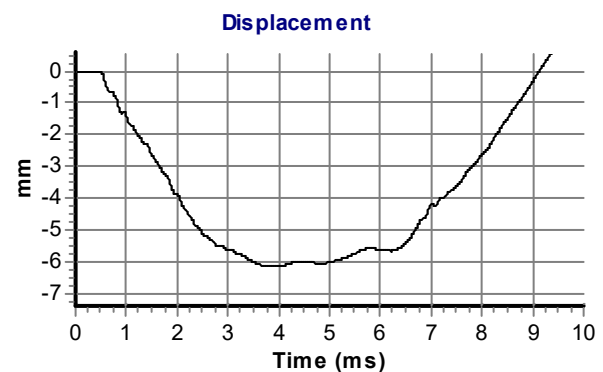
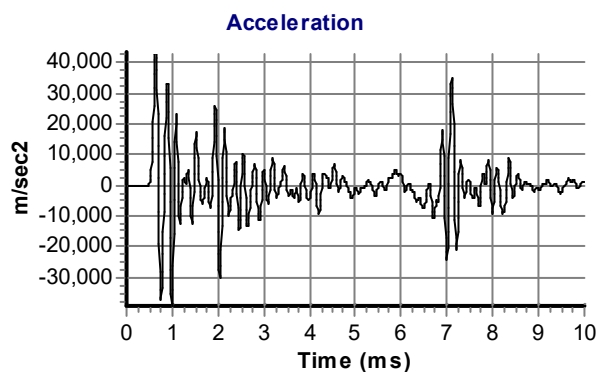
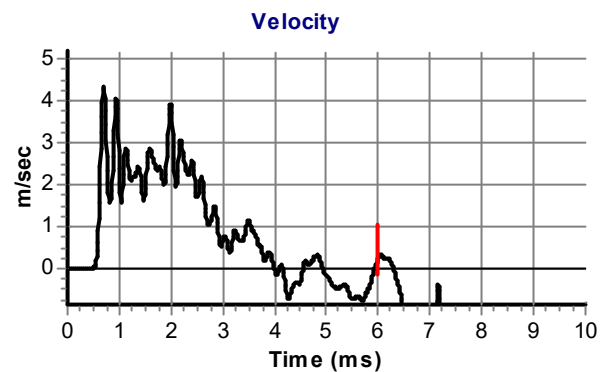
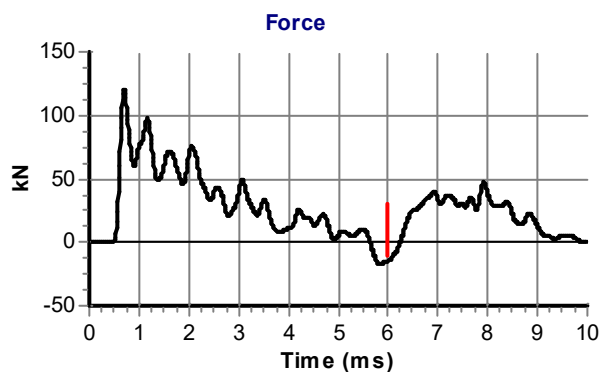
Instrumented Rod Data

Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.0
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 72570
Accelerometer No.2: 72571

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 12.6

Comments / Location



Calculations

Area of Rod A (mm²): 905
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 417

Energy Ratio E_r (%):

88

Signed: D Perrett
Title: Drilling Supervisor

APPENDIX B

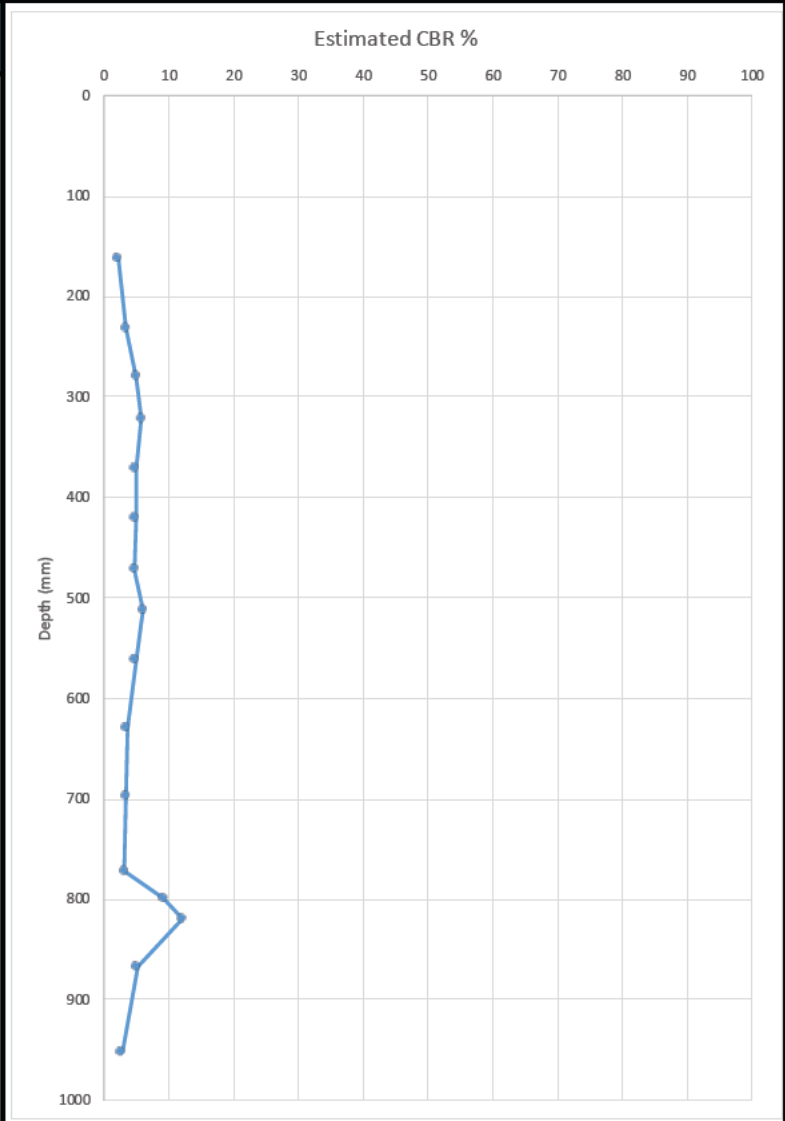
Dynamic Cone Penetrometer (DCP) Test Results

TRL Dynamic Cone Penetrometer Test Results



Client:	VH Land Partnerships Ltd	Site Location:	High Moor Farm, Clitheroe	Test No:	CBR1	Location:	375106, 441497
Project No:	1134.02	Date:	10.4.2025	Start Depth:	Surface	Test Strata:	Topsoil
$\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm}/\text{blow})$						Weather:	Dry Sunny

No of Blows	Depth Reading mm	Penetration/ Blow mm	CBR %
0	57	0	
1	162	105.0	2.2
2	232	70.0	3.4
3	280	48.0	5.0
4	322	42.0	5.8
5	372	50.0	4.8
6	421	49.0	4.9
7	472	51.0	4.7
8	512	40.0	6.1
9	562	50.0	4.8
10	629	67.0	3.5
11	697	68.0	3.5
12	772	75.0	3.1
13	799	27.0	9.3
14	820	21.0	12.1
15	867	47.0	5.2
16	952	85.0	2.8



Notes:

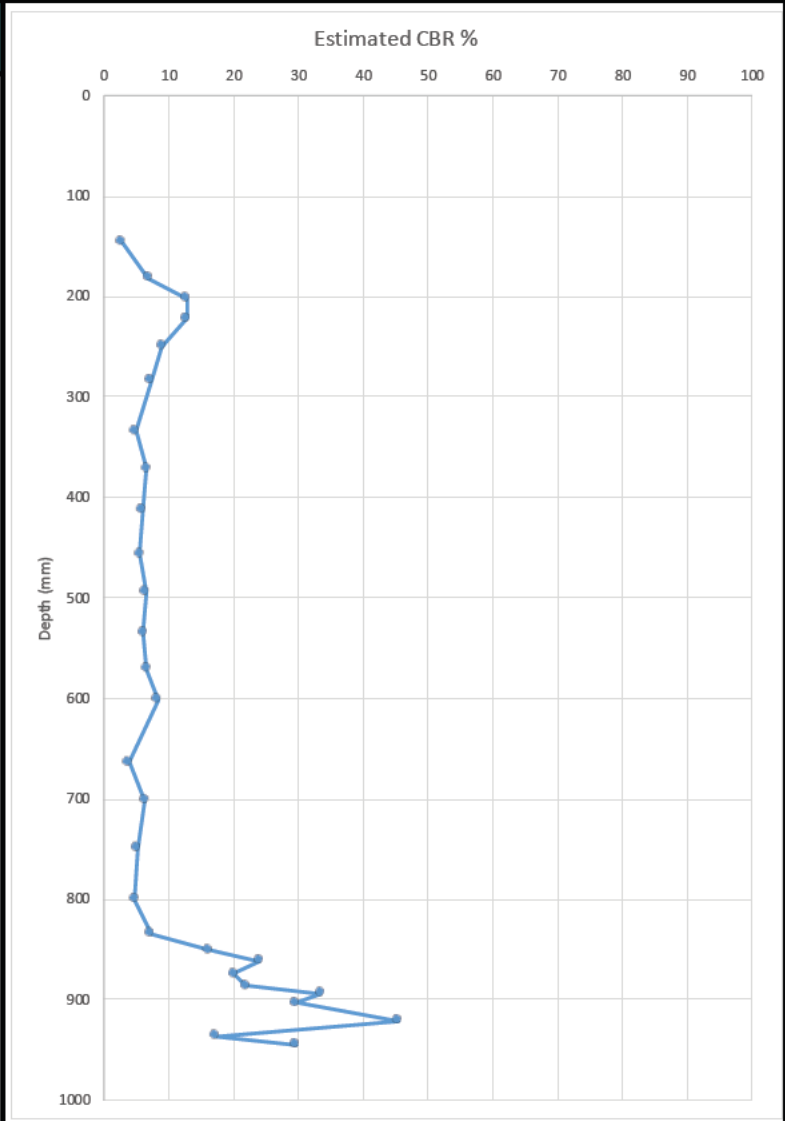
Tested by: L Hillman Date: 10.04.25	Checked by: K Szybut Date: 02.05.25
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TRL Dynamic Cone Penetrometer Test Results



Client:	VH Land Partnerships Ltd	Site Location:	High Moor Farm, Clitheroe	Test No:	CBR2	Location:	375063, 441549	
Project No:	1134.02	Date:	10.4.2025	Start Depth:	Surface	Test Strata:	Topsoil	
$\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$							Weather:	Dry Sunny

No of Blows	Depth Reading mm	Penetration/ Blow mm	CBR %
0	62	0	
1	146	84.0	2.8
2	182	36.0	6.8
3	202	20.0	12.7
4	222	20.0	12.7
5	250	28.0	8.9
6	284	34.0	7.3
7	334	50.0	4.8
8	371	37.0	6.6
9	412	41.0	6.0
10	456	44.0	5.5
11	494	38.0	6.5
12	534	40.0	6.1
13	571	37.0	6.6
14	601	30.0	8.3
15	663	62.0	3.8
16	702	39.0	6.3
17	749	47.0	5.2
18	800	51.0	4.7
19	834	34.0	7.3
20	850	16.0	16.1
21	861	11.0	23.9
22	874	13.0	20.1
23	886	12.0	21.8
24	894	8.0	33.5
25	903	9.0	29.6
28	921	6.0	45.4
29	936	15.0	17.3
30	945	9.0	29.6



Notes:

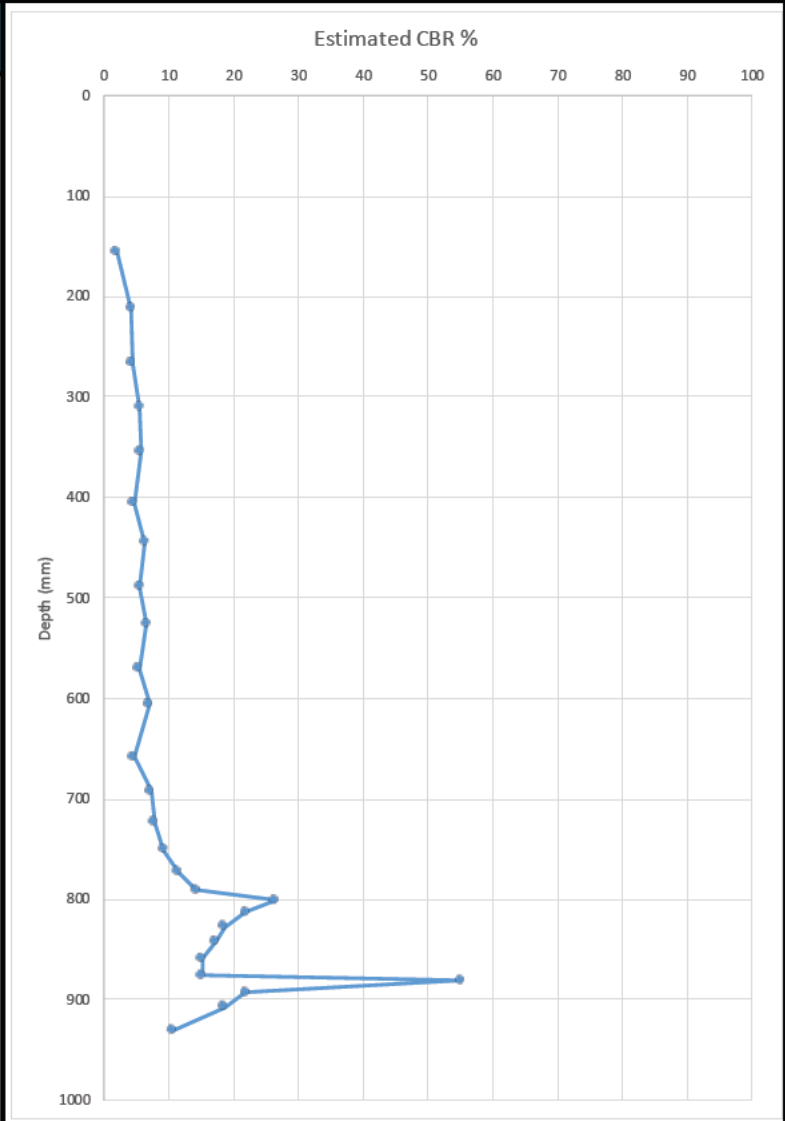
Tested by: L Hillman Date: 10.04.25	Checked by: K Szybut Date: 02.05.25
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TRL Dynamic Cone Penetrometer Test Results



Client:	VH Land Partnerships Ltd	Site Location:	High Moor Farm, Clitheroe	Test No:	CBR3	Location:	375237, 441662
Project No:	1134.02	Date:	10.4.2025	Start Depth:	Surface	Test Strata:	Topsoil
$\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm}/\text{blow})$						Weather:	Dry Sunny

No of Blows	Depth Reading mm	Penetration/ Blow mm	CBR %
0	42	0	
1	156	114.0	2.0
2	212	56.0	4.3
3	267	55.0	4.4
4	311	44.0	5.5
5	354	43.0	5.7
6	406	52.0	4.6
7	445	39.0	6.3
8	489	44.0	5.5
9	526	37.0	6.6
10	571	45.0	5.4
11	606	35.0	7.0
12	658	52.0	4.6
13	692	34.0	7.3
14	724	32.0	7.7
15	751	27.0	9.3
16	773	22.0	11.5
17	791	18.0	14.2
18	801	10.0	26.5
19	813	12.0	21.8
20	827	14.0	18.6
21	842	15.0	17.3
22	859	17.0	15.1
23	876	17.0	15.1
24	881	5.0	55.1
25	893	12.0	21.8
26	907	14.0	18.6
27	931	24.0	10.5



Notes:

Tested by: L Hillman
Date: 10.04.25

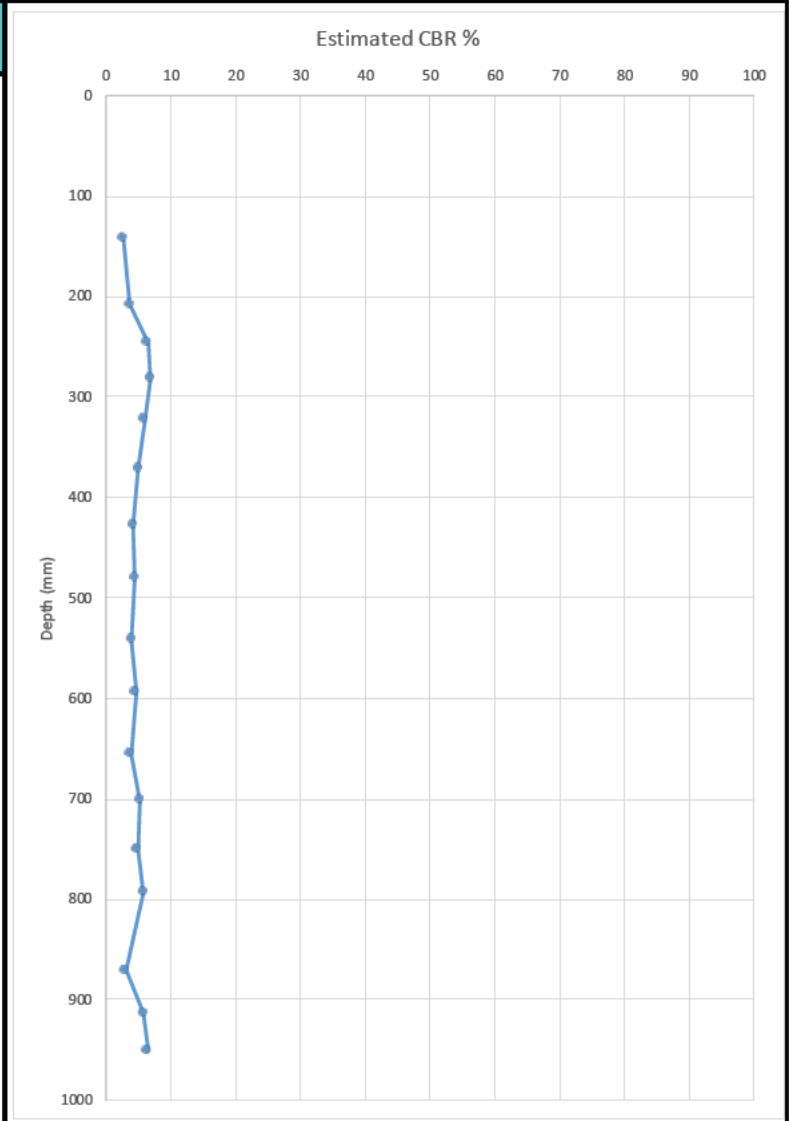
Checked by: K Szybut
Date: 02.05.25

TRL Dynamic Cone Penetrometer Test Results



Client:	VH Land Partnerships Ltd	Site Location:	High Moor Farm, Clitheroe	Test No:	CBR4	Location:	375165, 441727	
Project No:	1134.02	Date:	10.4.2025	Start Depth:	Surface	Test Strata:	Topsoil	
$\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm}/\text{blow})$							Weather:	Dry Sunny

No of Blows	Depth Reading mm	Penetration/ Blow mm	CBR %
0	56	0	
1	143	87.0	2.7
2	208	65.0	3.7
3	246	38.0	6.5
4	282	36.0	6.8
5	323	41.0	6.0
6	371	48.0	5.0
7	428	57.0	4.2
8	481	53.0	4.5
9	542	61.0	3.9
10	594	52.0	4.6
11	656	62.0	3.8
12	702	46.0	5.3
13	751	49.0	4.9
14	793	42.0	5.8
15	871	78.0	3.0
16	913	42.0	5.8
17	951	38.0	6.5



Notes:

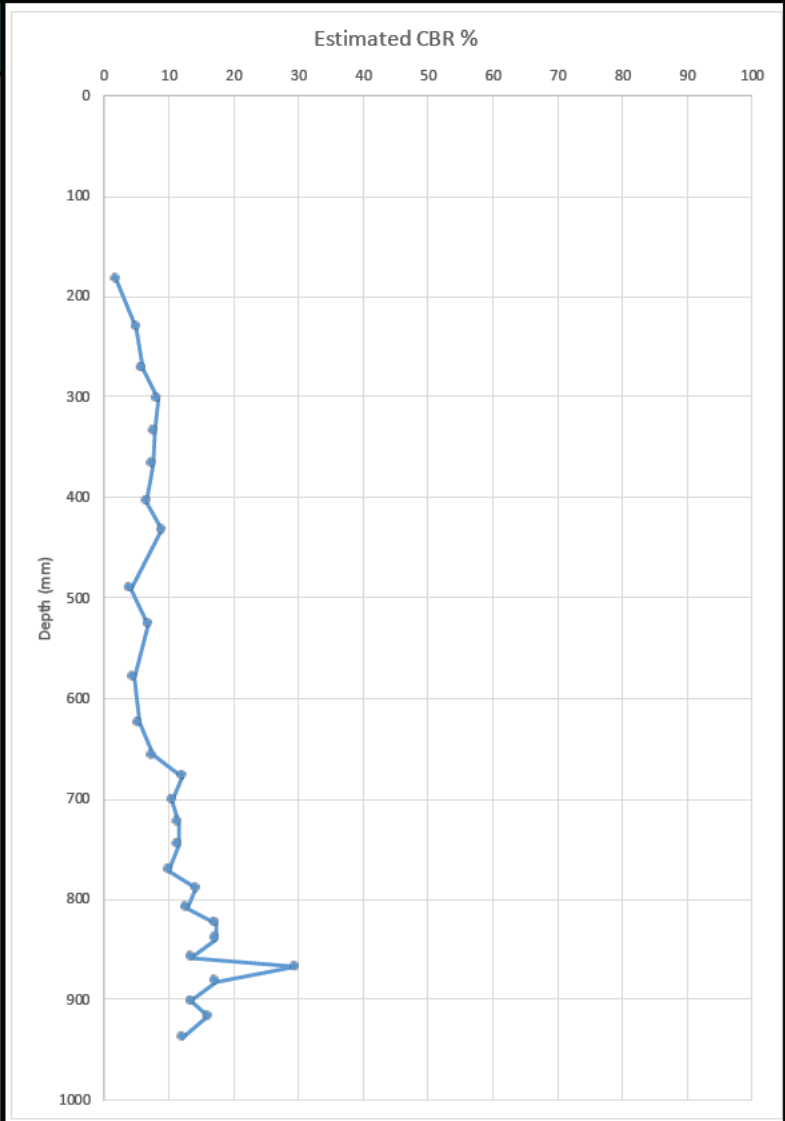
Tested by: L Hillman Date: 10.04.25	Checked by: K Szybut Date: 02.05.25
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TRL Dynamic Cone Penetrometer Test Results



Client:	VH Land Partnerships Ltd	Site Location:	High Moor Farm, Clitheroe	Test No:	CBR5	Location:	375097, 441718
Project No:	1134.02	Date:	10.4.2025	Start Depth:	Surface	Test Strata:	Topsoil
$Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(mm/blow)$						Weather:	Dry Sunny

No of Blows	Depth Reading mm	Penetration/ Blow mm	CBR %
0	60	0	
1	183	123.0	1.9
2	231	48.0	5.0
3	272	41.0	6.0
4	302	30.0	8.3
5	334	32.0	7.7
6	367	33.0	7.5
7	404	37.0	6.6
8	432	28.0	8.9
9	491	59.0	4.1
10	527	36.0	6.8
11	579	52.0	4.6
12	624	45.0	5.4
13	657	33.0	7.5
14	678	21.0	12.1
15	702	24.0	10.5
16	724	22.0	11.5
17	746	22.0	11.5
18	771	25.0	10.1
19	789	18.0	14.2
20	809	20.0	12.7
21	824	15.0	17.3
22	839	15.0	17.3
23	858	19.0	13.4
24	867	9.0	29.6
25	882	15.0	17.3
26	901	19.0	13.4
27	917	16.0	16.1
28	938	21.0	12.1



Notes:

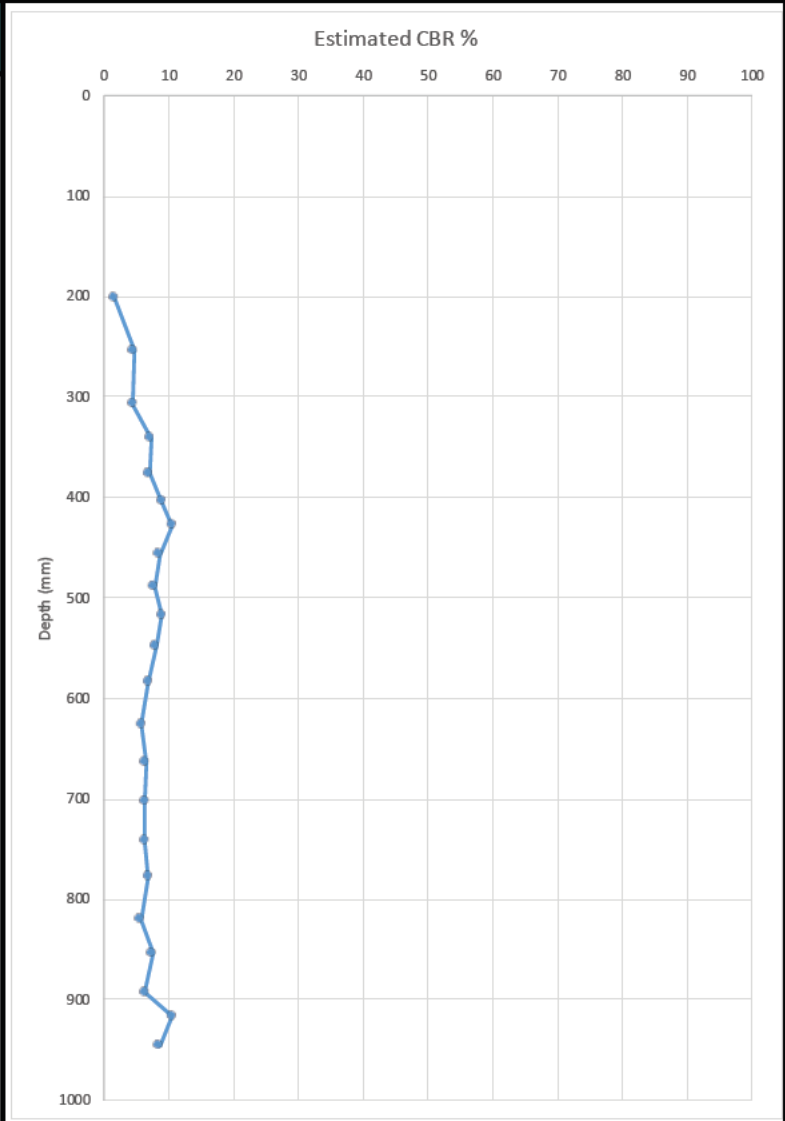
Tested by: L Hillman	Checked by: K Szybut
Date: 10.04.25	Date: 02.05.25

TRL Dynamic Cone Penetrometer Test Results



Client:	VH Land Partnerships Ltd	Site Location:	High Moor Farm, Clitheroe	Test No:	CBR6	Location:	375083, 441644
Project No:	1134.02	Date:	10.4.2025	Start Depth:	Surface	Test Strata:	Topsoil
$\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm}/\text{blow})$						Weather:	Dry Sunny

No of Blows	Depth Reading mm	Penetration/ Blow mm	CBR %
0	63	0	
1	202	139.0	1.6
2	254	52.0	4.6
3	307	53.0	4.5
4	341	34.0	7.3
5	376	35.0	7.0
6	404	28.0	8.9
7	428	24.0	10.5
8	457	29.0	8.6
9	489	32.0	7.7
10	517	28.0	8.9
11	548	31.0	8.0
12	584	36.0	6.8
13	626	42.0	5.8
14	664	38.0	6.5
15	703	39.0	6.3
16	742	39.0	6.3
17	778	36.0	6.8
18	821	43.0	5.7
19	854	33.0	7.5
20	893	39.0	6.3
21	917	24.0	10.5
22	946	29.0	8.6



Notes:

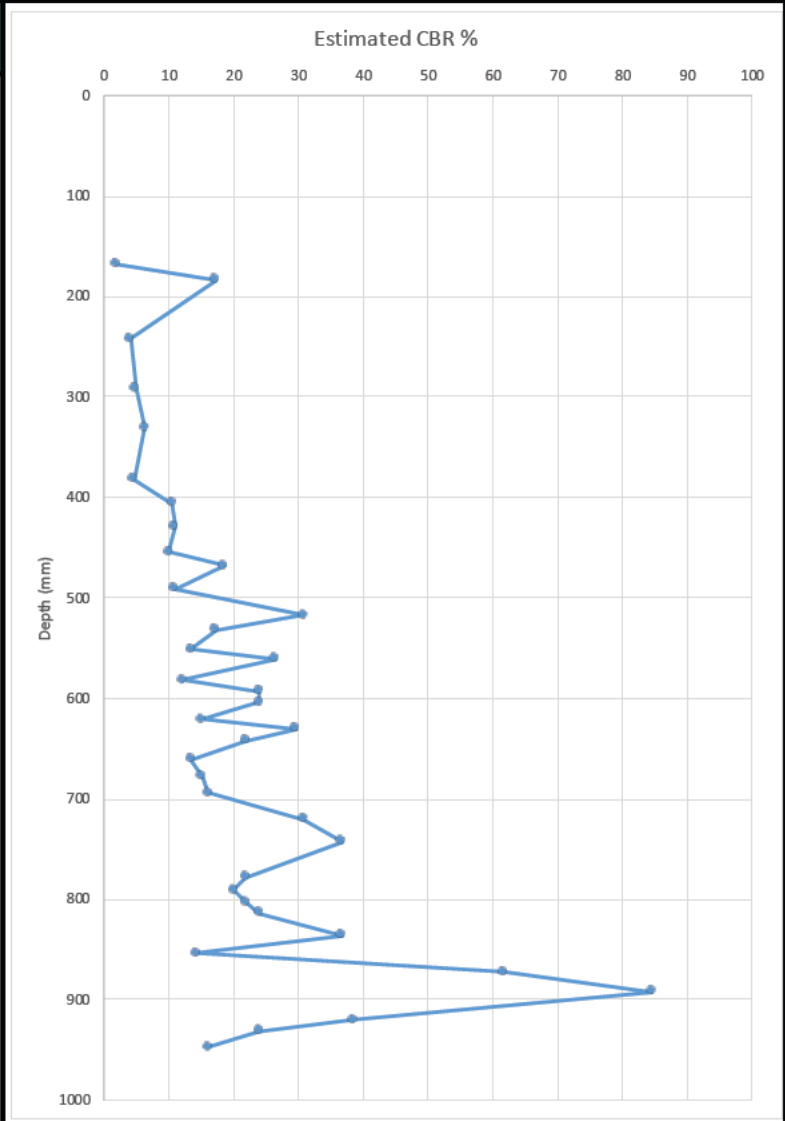
Tested by: L Hillman Date: 10.04.25	Checked by: K Szybut Date: 02.05.25
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TRL Dynamic Cone Penetrometer Test Results



Client:	VH Land Partnerships Ltd	Site Location:	High Moor Farm, Clitheroe	Test No:	CBR7	Location:	375137, 441582
Project No:	1134.02	Date:	10.4.2025	Start Depth:	Surface	Test Strata:	Topsoil
$Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(mm/blow)$						Weather:	Dry Sunny

No of Blows	Depth Reading mm	Penetration/ Blow mm	CBR %
0	53	0	
1	168	115.0	2.0
2	183	15.0	17.3
3	242	59.0	4.1
4	291	49.0	4.9
5	330	39.0	6.3
6	382	52.0	4.6
7	406	24.0	10.5
8	429	23.0	11.0
9	454	25.0	10.1
10	468	14.0	18.6
11	491	23.0	11.0
14	517	8.7	30.8
15	532	15.0	17.3
16	551	19.0	13.4
17	561	10.0	26.5
18	582	21.0	12.1
19	593	11.0	23.9
20	604	11.0	23.9
21	621	17.0	15.1
22	630	9.0	29.6
23	642	12.0	21.8
24	661	19.0	13.4
25	678	17.0	15.1
26	694	16.0	16.1
29	720	8.7	30.8
32	742	7.3	36.8
35	778	12.0	21.8
36	791	13.0	20.1
37	803	12.0	21.8
38	814	11.0	23.9
41	836	7.3	36.8
42	854	18.0	14.2
46	872	4.5	61.6
52	892	3.3	84.6
56	920	7.0	38.6
57	931	11.0	23.9
58	947	16.0	16.1



Notes:

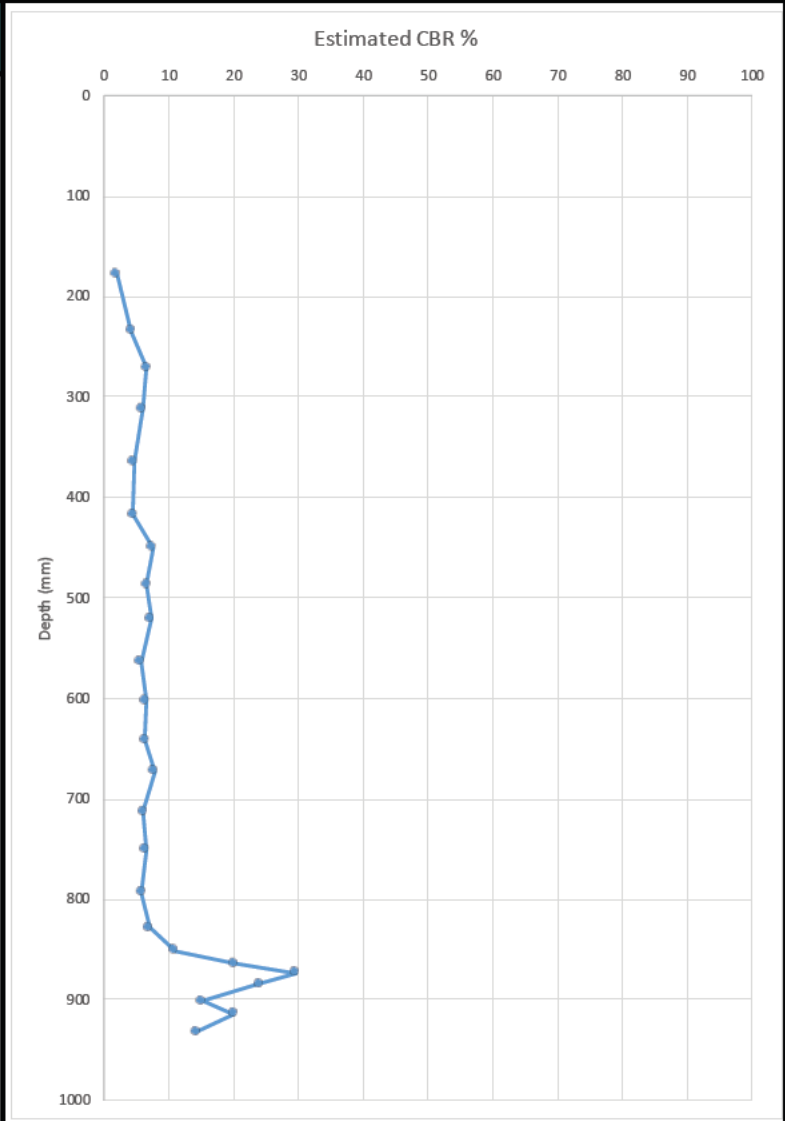
Tested by: L Hillman Date: 10.04.25	Checked by: K Szybut Date: 02.05.25
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TRL Dynamic Cone Penetrometer Test Results



Client:	VH Land Partnerships Ltd	Site Location:	High Moor Farm, Clitheroe	Test No:	CBR8	Location:	375136, 441660	
Project No:	1134.02	Date:	10.4.2025	Start Depth:	Surface	Test Strata:	Topsoil	
$\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$							Weather:	Dry Sunny

No of Blows	Depth Reading mm	Penetration/ Blow mm	CBR %
0	64	0	
1	178	114.0	2.0
2	234	56.0	4.3
3	271	37.0	6.6
4	312	41.0	6.0
5	364	52.0	4.6
6	417	53.0	4.5
7	450	33.0	7.5
8	487	37.0	6.6
9	521	34.0	7.3
10	564	43.0	5.7
11	602	38.0	6.5
12	641	39.0	6.3
13	673	32.0	7.7
14	713	40.0	6.1
15	751	38.0	6.5
16	793	42.0	5.8
17	828	35.0	7.0
18	851	23.0	11.0
19	864	13.0	20.1
20	873	9.0	29.6
21	884	11.0	23.9
22	901	17.0	15.1
23	914	13.0	20.1
24	932	18.0	14.2



Notes:

Tested by: L Hillman Date: 10.04.25	Checked by: K Szybut Date: 02.05.25
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APPENDIX C

Soakaway Test Results

Soakaway Test Report

Client: VH Land Partnerships Limited
Job Name: High Moor Farm, Clitheroe
Job No.: 1134.02

Test Date: 10.04.25

Trial Pit No.	SA1
Test No.	1
Coordinates:	375207, 441696

Soil Description: 0-0.25m TOPSOIL,
 0.25- 1.0m Firm very sandy CLAY,
 1.0 to 1.4m Soft slightly sandy gravelly CLAY.
Weather Conditions: Dry & sunny

Time	Elapsed Time (min)	Depth to water from ground level	
		(m)	(mm)
09:12	0	0.410	410
09:13	1	0.430	430
09:14	2	0.435	435
09:15	3	0.440	440
09:16	4	0.450	450
09:17	5	0.450	460
09:22	10	0.460	470
09:27	15	0.470	475
09:32	20	0.475	475
10:03	51	0.490	490
10:52	100	0.560	560
12:15	183	0.650	650
13:44	272	0.720	720
15:06	354	0.76	760

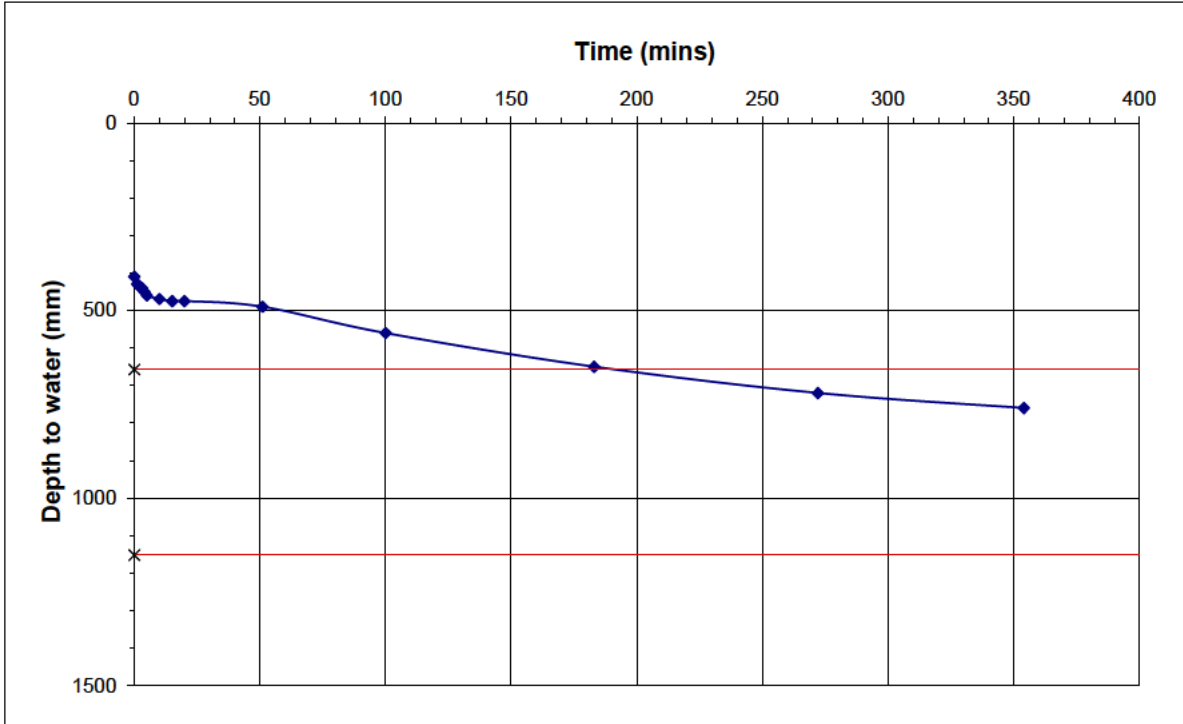
Soakaway Dimensions		(m)	(mm)
Length	=	1.60	1600
Width	=	0.40	400
Depth	=	1.40	1400

Effective depth (empty)		m	mm
25%	=	1.15	1152.5
50%	=	0.91	905.0
75%	=	0.66	657.5

Depth at start of test (mm)	=	410
Depth at end of test (mm)	=	760

Base area of pit	=	0.640
a_{p50} - 50% internal surface area inc. base	=	2.620
V_{p75-25} - Volume 75 - 25%	=	0.317

t_{p75} (min) = (Read from graph)	190
t_{p25} (min) = (Read from graph)	N/A
t_p values extrapolated from graph data	#VALUE!
t_p value (seconds) =	#VALUE!



Soil infiltration rate, f , (m/s) = #VALUE! **(normal test)**
Soil infiltration rate, f , (m/s) = #VALUE! **(pit filled with stone)**

Notes: Insufficient infiltration

Logged By	LH	Checked by	KS
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Soakaway Test Report

Client: VH Land Partnerships Limited
Job Name: High Moor Farm, Clitheroe
Job No.: 1134.02

Test Date: 10.04.25

Trial Pit No.	SA3
Test No.	1
Coordinates:	375060, 441509

Soil Description: 0-0.25m TOPSOIL,
 0.25- 0.8m Firm to stiff slightly sandy gravelly CLAY,
 0.8 to 1.35m Soft slightly sandy gravelly CLAY.
Weather Conditions: Dry & sunny

Time	Elapsed Time (min)	Depth to water from ground level	
		(m)	(mm)
10:25	0	0.28	280
10:26	1	0.28	280
10:27	2	0.285	285
10:28	3	0.285	285
10:29	4	0.29	290
10:30	5	0.29	290
10:35	10	0.29	290
10:45	20	0.295	295
10:55	30	0.31	310
12:10	105	0.33	330
13:03	158	0.34	340
13:46	201	0.36	360
14:52	267	0.37	370

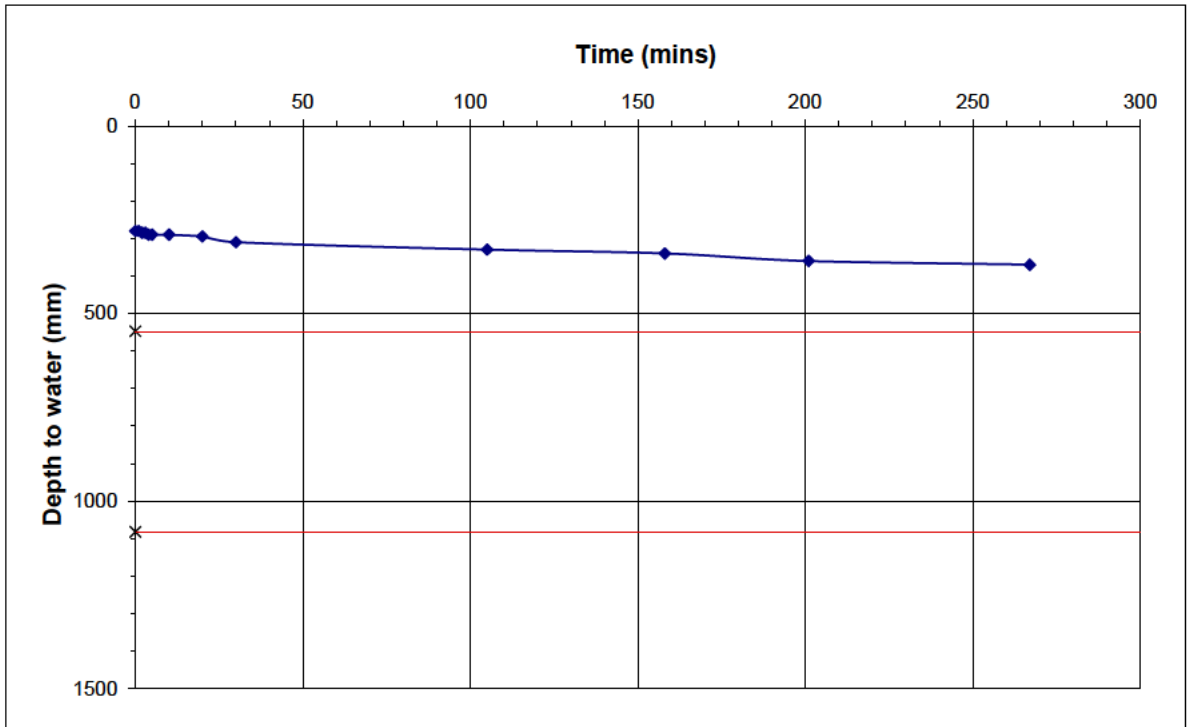
Soakaway Dimensions		(m)	(mm)
Length	=	1.20	1200
Width	=	0.40	400
Depth	=	1.35	1350

Effective depth (empty)		m	mm
25%	=	1.08	1082.5
50%	=	0.82	815.0
75%	=	0.55	547.5

Depth at start of test (mm)	=	280
Depth at end of test (mm)	=	370

Base area of pit	=	0.480
a_{p50} - 50% internal surface area inc. base	=	2.192
V_{p75-25} - Volume 75 - 25%	=	0.257

t_{p75} (min) = (Read from graph)	N/A
t_{p25} (min) = (Read from graph)	N/A
t_p values extrapolated from graph data	#VALUE!
t_p value (seconds) =	#VALUE!



Soil infiltration rate, f , (m/s) = #VALUE! **(normal test)**
Soil infiltration rate, f , (m/s) = #VALUE! **(pit filled with stone)**

Notes: Insufficient infiltration

Logged By	LH	Checked by	KS
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APPENDIX D

Gas Analyser Calibration Certificate



SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Socotec uk
Progress close
Binley
Coventry
CV3 2TF

SPT Hammer Ref: 110.24
Test Date: 30/01/2025
Report Date: 30/01/2025
File Name: 110.24.spt
Test Operator: DP

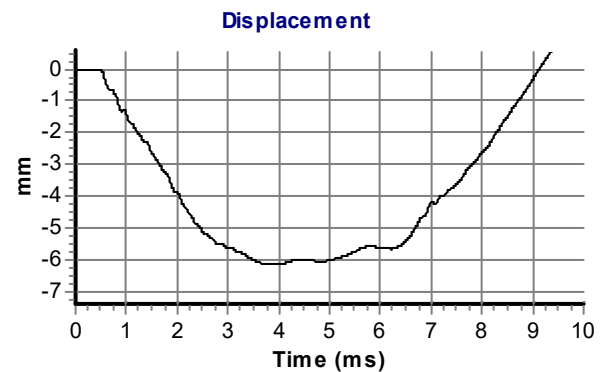
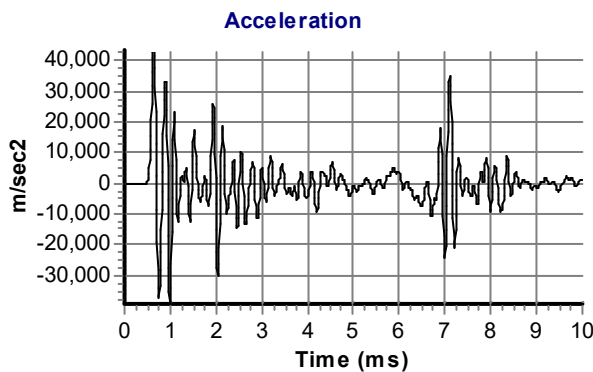
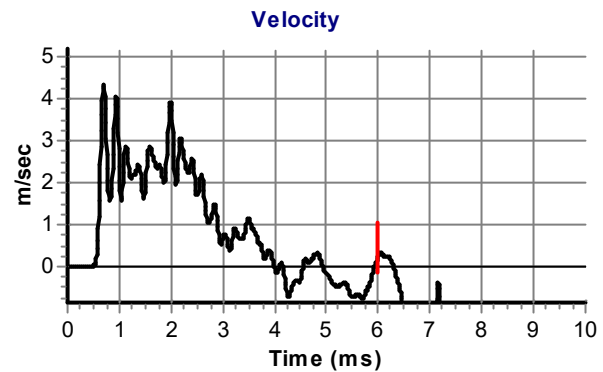
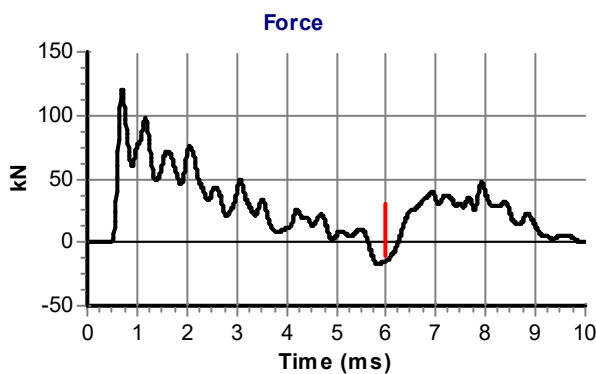
Instrumented Rod Data

Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.0
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 72570
Accelerometer No.2: 72571

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 12.6

Comments / Location



Calculations

Area of Rod A (mm²): 905
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 417

Energy Ratio E_r (%):

88

Signed: D Perrett
Title: Drilling Supervisor

TEST DATE AND CONDITIONS		
Date	26/11/2024	
Atmospheric Pressure	996	mB
Ambient Temperature	21.5	°C
EnviroNics Serial No.	5089	

**GFM436 Final Inspection & Calibration
Check Certificate**

GAS DATA LTD

Unit D
Earlplace Business Park
Fletchamstead Highway
Coventry
CV4 9XL



GAS DATA
CALIBRATION • SERVICE • TRAINING

Tel 02476303311 Fax 02476307711

Customer	Dunelm Geotechnical & Environmental Ltd
Certificate Number	125731
Order Number	340258

Serial Number	13121
Software Version	G436-00.0029/0010

Recalibration DUE Date
26/11/25

Instrument Checks				
Keyboard	✓		Display Contrast	✓
Pump Flow In	500	Accept > 200 cc/min	Pump Flow @ -200mB	300
				Accept > 200 cc/min
Clock Set / Running	✓		Labels Fitted	✓

Gas Checks						
Sensor	CH ₄		CO ₂		O ₂	
	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %
	60.0	60	40.1	40	20.9	20.9
Accept ±3.0	Accept ±3.0		Accept ±0.5			
5.1	5	5.0	5	6.0	6	
Accept ±0.3		Accept ±0.3		Accept ±0.3		
Zero Reading 100% N ₂	0.0	0.0	0	0.0	0	
Accept ±0.0		Accept ±0.0		Accept ±0.1		

Optional Gas Checks						
Applied Gas & Range		Concentration Tested @ (ppm)	Instrument Readings (ppm)			
Gas Type	Range (ppm)		Zero Reading		Instrument Gas Reading	
H ₂ S	5000	1500	0	Accept ±0.0	1500	Accept ±5.0%
CO	2000	1000	0	Accept ±0.0	1001	Accept ±5.0%
Hexane	2.0%	2.0%	0	Accept ±0.0	1.99	Accept ±10.0%

Cross Gas Effects									
Applied Gas (ppm)		Instrument Readings (ppm)							
Gas Type	Concentration	Toxic 1:	H2S	Toxic 2:	CO	Toxic 3:	HEX		
H2S	1500	1500		0		0			
CO	1000	130		1001		0			
Hexane	2.0%	0		0		1.99			

Pressure Checks			
Atmospheric Pressure [AP] (mB)			
Current Atmospheric Pressure (mB)		Instrument Atmospheric Pressure Reading (mB)	
AP Open Ports		995	Accept ± 2.0
AP Port (Internal)	+800 mB	800	Accept ± 5.0
	+1200mB	1200	Accept ± 5.0

Flow Checks					
Borehole Flow			Differential Pressure		
Applied Reading (l/h)	Instrument Reading (l/h)		Applied Pressure (Pa)	Instrument Reading (Pa)	
-30	-30.0	Accept ± 3.0	-495	-497	Accept ± 50
-3	-3.0	Accept ± 1.0	-19	-19	Accept ± 6.0
0	0.0	Accept ± 0.0	0	0	Accept ± 0.5
3	3.0	Accept ± 0.5	16	15	Accept ± 3.0
30	29.9	Accept ± 3.0	388	385	Accept ± 50
60	60.0	Accept ± 6.0	1189	1185	Accept ± 110
90	91.0	Accept ± 9.0	2354	2424	Accept ± 250

Temperature Checks		
Calibration Temperature	Instrument Temperature Reading $^{\circ}\text{C}$	
Applied Temperature $^{\circ}\text{C}$		
-10	-10.0	Accept ± 2.0
0	0.0	Accept ± 1.0
30	30.0	Accept ± 1.0
60	60.0	Accept ± 1.0
100	100.0	Accept ± 1.0

Technician:
Jack Rutland

Date Tested:
26/11/2024

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015, BS EN ISO14001:2015, BS EN ISO45001:2018 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated.

The results displayed on the instrument at each stage are recorded above.

TEST DATE AND CONDITIONS		
Date	26.11.24	
Atmospheric Pressure	096	mB
Ambient Temperature	21.5	°C
Enviroics Serial No.	5089	

GAS DATA LTD Unit D Earplace Business Park Fletchamstead Highway Coventry CV4 9XL UK +44 (0) 24 7630 3311	 GAS DATA <small>TESTING ANALYSIS TRAINING</small>
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GFM436-1 OUTWARD INSPECTION & QUALITY CHECK SHEET

INSTRUMENT DETAILS			
SO Number	Instrument Type	Instrument Serial Number + SW Version	Job Number(s)
340252	GFM436	15171 G436-29/10	125731

Calibration Technician [REDACTED] Date 26.11.24
 Inspection Technician [REDACTED] Date 27.11.24

INSTRUMENT CHECKS		Pass (P), Fail (F) or not applicable (NA)	INSTRUMENT PACKING LIST		Tick if included	
Function Tests	Dust Caps Fitted	P	Instrument		✓	
	Keyboard Test (All Keys)	P	Leather Case		✓	
	Backlight	P	Instrument Strap		✓	
	Clock Set / Running	P	AC Battery Charger (UK)		✓	
	Comms Test	P	AC Battery Charger (EURO)		X	
	Pump Flow Test (In & Out)	P	AC Battery Charger (US)		X	
	Overall Leak Test (30mB)	n/a	AC Battery Charger (AUS)		X	
	Battery Charge Test	P	Gas Sample Pipe - (new issue)		✓	
	Service Date set to?	26.11.25	Flow Sample Pipe - (new issue)		✓	
Channel Tests	Data Logging Enabled?	P	Hard Carry Case		✓	
	Verify CH4/LEL/Hexane/PID	P	Spares Pot		X	
	Verify CO2	P	Allen Key		X	
	Verify O2	P	Temperature Probe		X	
	Verify H2S	P	Vane Anemometer		X	
	Verify CO	P	USB Cable		X	
	Verify LEL	P	USB Memory stick		X	
	Verify 1 st Option Gas	N/A	SM V5 Software	Ver	605	X
	Verify Atmospheric pressure	P	Internal Filter Pack	Qty		X
	Verify differential pressure	P	External Filter Pack	Qty		X
	Verify flow	P	Field Guide		X	
	Verify temperature probe input	P	Extra Items: <i>Sample Tubes</i>			
	Verify vane anemometer input	P				
DataBase Checks	Jobcard(s) completed and signed	P	Comments:			
	Jobcard(s) booked off database	P				
	Calibration certificate completed	P				
	Complete & print QI record	n/a				
Label Checks	No. of Calibration label fitted	GDC 13629				
	MCERTS label displayed	N/A				
	Warranty label fitted					
H2S Range	H2S Range from Sales Order	5000 ppm				
	H2S Range from Cal Cert	5000 ppm				
	Over-range value correct?	P				
QA Cylinders Used	No. of High Range CH4/CO2	60194				
	No. of Low Range CH4/CO2/O2	56840				
	No. of H2S	6037292				
	No. of CO	56836				
	No. of Optional Cylinder	N/A				

APPENDIX E

Laboratory Chemical Analysis



Remada Ltd
Forward House
17 High Street
Henley-in-Arden
Warwickshire
B955AA

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 25-017782

Project / Site name:	High Moor Farm Clitheroe	Samples received on:	09/04/2025
Your job number:	1134 02	Samples instructed on/ Analysis started on:	09/04/2025
Your order number:	1134 02	Analysis completed by:	16/04/2025
Report Issue Number:	1	Report issued on:	16/04/2025
Samples Analysed:	4 soil samples		

Signed: 

Joanna Wawrzeczko
Senior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting
	air	- once the analysis is complete

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 25-017782
 Project / Site name: High Moor Farm Clitheroe
 Your Order No: 1134 02

Lab Sample Number	507208	507209	507210	507211
Sample Reference	WS1	WS3	WS5	WS6
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A	N/A
Depth (m)	0.20	0.10	0.10	0.50
Date Sampled	02/04/2025	02/04/2025	02/04/2025	02/04/2025
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	47.4	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	18	34	32	20
Total mass of sample received	kg	0.1	NONE	1.1	1.1	1.1	2

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KWB	KWB	MUA	KWB
Analysis completed	N/A	N/A	N/A	15/04/2025	15/04/2025	16/04/2025	15/04/2025

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.6	6.6	6.5	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.027	0.044	0.036	0.0086

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.1	0.06	0.08	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.22	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.07	0.11	0.45	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.18	0.08	0.29	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	2.2	0.86	3.4	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.59	0.16	0.73	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	4.6	1.7	5.3	< 0.05
Pyrene	mg/kg	0.05	MCERTS	4	1.4	4.5	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2	0.74	2.1	< 0.05
Chrysene	mg/kg	0.05	MCERTS	2.1	0.8	2.3	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2.5	0.89	2.4	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.1	0.43	1	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.3	0.83	2.2	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	0.38	1	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.29	0.11	0.27	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.2	0.4	1.1	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	24.5	8.91	27.2	< 0.80
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Analytical Report Number: 25-017782
 Project / Site name: High Moor Farm Clitheroe
 Your Order No: 1134 02

Lab Sample Number	507208			507209			507210			507211		
Sample Reference	WS1			WS3			WS5			WS6		
Sample Number	None Supplied			None Supplied			None Supplied			None Supplied		
Water Matrix	N/A			N/A			N/A			N/A		
Depth (m)	0.20			0.10			0.10			0.50		
Date Sampled	02/04/2025			02/04/2025			02/04/2025			02/04/2025		
Time Taken	None Supplied			None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status									

Heavy Metals / Metalloids

Element	Units	Test Limit of detection	Test Accreditation Status	507208	507209	507210	507211
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.4	14	15	13
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.99	1.2	1.1	1.5
Boron (water soluble)	mg/kg	0.2	MCERTS	2	2	0.6	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.8	1.2	0.7	0.6
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	13	35	26	34
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	36	27	35
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	21	27	21
Lead (aqua regia extractable)	mg/kg	1	MCERTS	42	72	64	26
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	21	23	46
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.3	1.3	1.2
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	23	54	42	43
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	140	130	85

Petroleum Hydrocarbons

Parameter	Units	Test Limit of detection	Test Accreditation Status	507208	507209	507210	507211
TPHCWG - Aliphatic >EC5 - EC6 _{HS_ID_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC6 - EC8 _{HS_ID_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC8 - EC10 _{HS_ID_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_ID_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_ID_AL}	mg/kg	2	MCERTS	2	< 2.0	< 2.0	< 2.0
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_ID_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_ID_AL}	mg/kg	8	MCERTS	11	< 8.0	< 8.0	< 8.0
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_ID_AL}	mg/kg	10	NONE	13	< 10	< 10	< 10

Parameter	Units	Test Limit of detection	Test Accreditation Status	507208	507209	507210	507211
TPHCWG - Aromatic >EC5 - EC7 _{HS_ID_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 _{HS_ID_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 _{HS_ID_AR}	mg/kg	0.02	MCERTS	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_ID_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_ID_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_ID_AR}	mg/kg	10	MCERTS	11	< 10	11	< 10
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_ID_AR}	mg/kg	10	MCERTS	21	< 10	14	< 10
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_ID_AR}	mg/kg	10	NONE	32	< 10	25	< 10

VOCs

Parameter	Units	Test Limit of detection	Test Accreditation Status	507208	507209	507210	507211
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number : 25-017782

Project / Site name: High Moor Farm Clitheroe

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
507208	WS1	None Supplied	0.2	Brown loam with stones
507209	WS3	None Supplied	0.1	Brown loam and clay with gravel
507210	WS5	None Supplied	0.1	Brown loam and clay with gravel
507211	WS6	None Supplied	0.5	Brown clay

Analytical Report Number : 25-017782

Project / Site name: High Moor Farm Clitheroe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
TPH Chromatogram in soil	TPH Chromatogram in soil	In-house method	L064B	D	NONE
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	MCERTS
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL/L130B	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L009B	D	MCERTS



Analytical Report Number : 25-017782
Project / Site name: High Moor Farm Clitheroe

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)
Final Sewage Effluent (FSE) Landfill Leachate (LL)

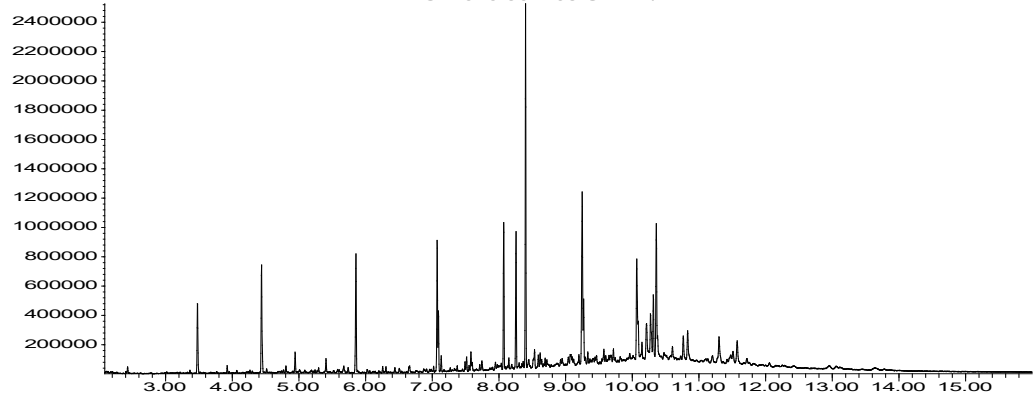
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
 For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
 For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
 Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
 Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
 The result for sum should be interpreted with caution

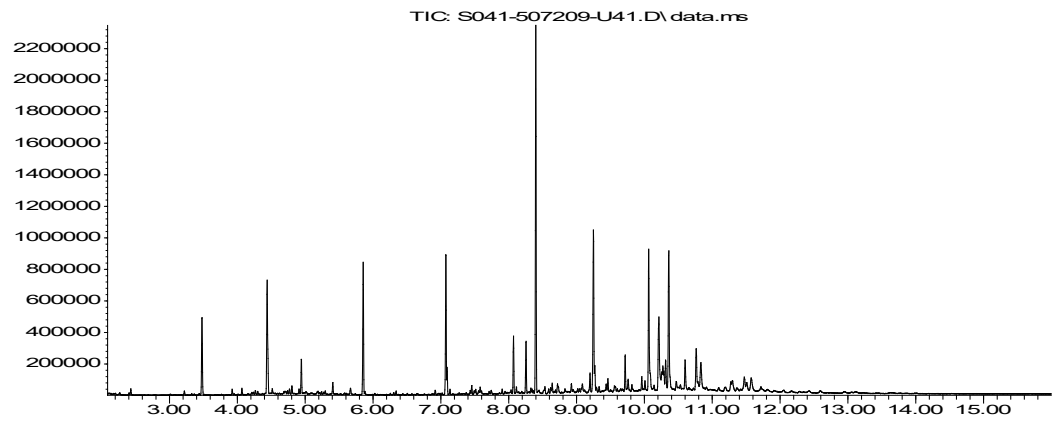
Abundance

TIC: S040-507208-U41.D\data.ms



Time-->

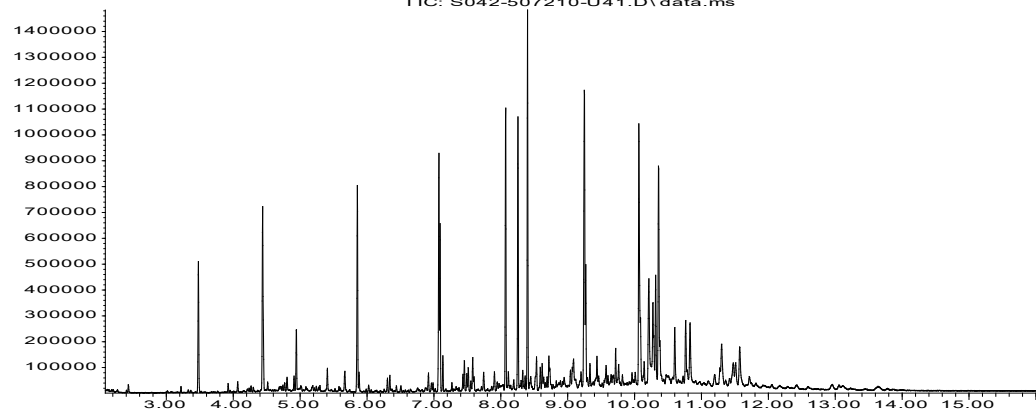
Abundance



Time→

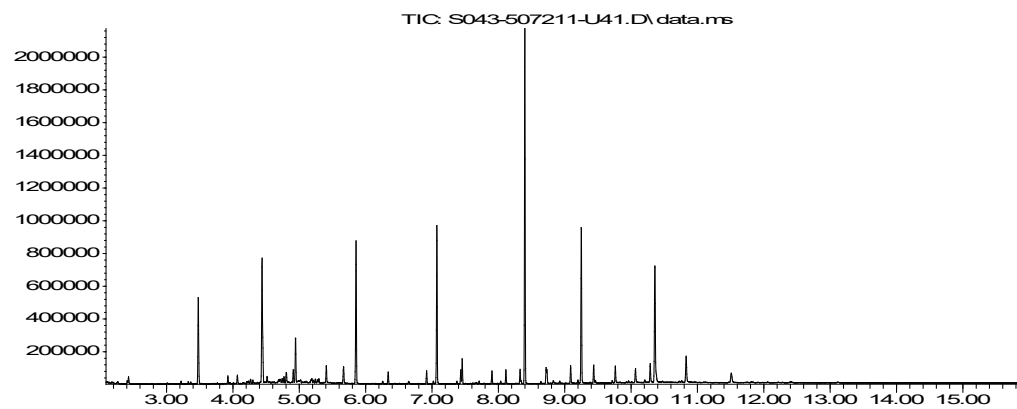
Abundance

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Time-->

Abundance



Time→



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Preliminary Report Number : 25-018494

Project / Site name:	High Moor Farm, Clitheroe	Samples received on:	11/04/2025
Your job number:	1134 02	Samples instructed on/ Analysis started on:	11/04/2025
Your order number:	1134 02	Analysis completed by:	not complete
Report Issue Number:	0	Report issued on:	24/04/2025
Samples Analysed:	8 soil samples		

Signed

Trevor Hill
Customer Service Advisor
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

Excel copies of reports are only valid when accompanied by this PDF certificate.

Preliminary reports provided at the request of the client should be considered as incomplete and have not been through the complete quality control procedure.

Results contained in preliminary reports may be subject to change and therefore should not be used as a basis for decision making, except at the risk of the

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.

Application of uncertainty of measurement would provide a range within which the true result lies.

An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 25-018494
 Project / Site name: High Moor Farm, Clitheroe
 Your Order No: 1134 02

Lab Sample Number	510619			510620			510621			510622			510623		
Sample Reference	TP1			TP2			TP7			TP10			TP2		
Sample Number	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Water Matrix	N/A			N/A			N/A			N/A			N/A		
Depth (m)	0.10			0.40			0.20			0.40			1.20		
Date Sampled	10/04/2025			10/04/2025			10/04/2025			10/04/2025			10/04/2025		
Time Taken	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status												

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	18.8
Moisture Content	%	0.01	NONE	27	20	38	21	13	
Total mass of sample received	kg	0.1	NONE	2	2	1.1	1.1	1	

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	SPU	SPU	PDO	SPU	SPU	-
Analysis completed	N/A	N/A	N/A	23/04/2025	23/04/2025	23/04/2025	23/04/2025	23/04/2025	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	6.3	7.7	6.5	7.2	8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	-	-	0.051
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	-	-	-	34
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	-	16.9
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	-	-	1.4
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	450
Total Sulphur	%	0.005	MCERTS	-	-	-	-	0.045
Ammoniacal Nitrogen as NH ₄ ⁺	mg/kg	0.5	MCERTS	-	-	-	-	< 0.5
Ammonium as NH ₄ ⁺ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	-	-	-	< 0.05
Organic Matter	%	0.1	MCERTS	-	-	19	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.046	0.0092	-	0.018	-
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	-	0.11	-	-
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	2	NONE	-	-	-	-	< 2.0
Water Soluble Nitrate (2:1) as NO ₃ (leachate equivalent)	mg/l	5	NONE	-	-	-	-	< 5.0

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.1	< 1.0	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	0.19	< 0.05	0.29	< 0.05	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	0.44	< 0.05	0.73	< 0.05	-
Pyrene	mg/kg	0.05	MCERTS	0.42	< 0.05	0.68	< 0.05	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.18	< 0.05	0.35	< 0.05	-
Chrysene	mg/kg	0.05	MCERTS	0.28	< 0.05	0.42	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.33	< 0.05	0.55	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.12	< 0.05	0.26	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.23	< 0.05	0.49	< 0.05	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.12	< 0.05	0.22	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.15	< 0.05	0.25	< 0.05	-

Analytical Report Number: 25-018494
 Project / Site name: High Moor Farm, Clitheroe
 Your Order No: 1134 02

Lab Sample Number				510619	510620	510621	510622	510623
Sample Reference				TP1	TP2	TP7	TP10	TP2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.10	0.40	0.20	0.40	1.20
Date Sampled				10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	2.44	< 0.80	4.23	< 0.80	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	15	15	12	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.84	1.3	1.1	1.4	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	0.6	2.7	0.9	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.8	1.2	1.2	0.8	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	-
Chromium (III)	mg/kg	1	NONE	33	25	35	28	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	26	37	30	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	16	35	21	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	64	30	78	37	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	44	21	32	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.7	< 1.0	1.3	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	50	33	56	38	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	150	170	170	-
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	-	-	3.7
Magnesium (water soluble)	mg/kg	5	NONE	-	-	-	-	7.3

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	-
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	-
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	-
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	To follow	< 1.0	To follow	< 1.0	-
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	To follow	< 2.0	To follow	< 2.0	-
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	To follow	< 8.0	To follow	< 8.0	-
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	To follow	< 8.0	To follow	< 8.0	-
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	To follow	< 10	To follow	< 10	-

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	-
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	-
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	< 0.020	< 0.020	< 0.020	< 0.020	-
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	To follow	< 1.0	To follow	< 1.0	-
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	To follow	< 2.0	To follow	< 2.0	-
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	To follow	< 10	To follow	< 10	-
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	To follow	< 10	To follow	< 10	-
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	To follow	< 10	To follow	< 10	-

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	-
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	-
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	-
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	-
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 25-018494
 Project / Site name: High Moor Farm, Clitheroe
 Your Order No: 1134 02

Lab Sample Number	510624			510625			510626		
Sample Reference	TP3			TP6			TP10		
Sample Number	None Supplied			None Supplied			None Supplied		
Water Matrix	N/A			N/A			N/A		
Depth (m)	1.80			1.60			1.40		
Date Sampled	10/04/2025			10/04/2025			10/04/2025		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status						

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	8.1	11	15
Total mass of sample received	kg	0.1	NONE	1	1	1

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	-	-	-
Analysis completed	N/A	N/A	N/A	-	-	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.3	8.5	8.3
Total Cyanide	mg/kg	1	MCERTS	-	-	-
Total Sulphate as SO ₄	%	0.005	MCERTS	0.095	0.047	0.043
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	230	23	25
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	114	11.3	12.7
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	6.6	1.4	1
Total Sulphur	mg/kg	50	MCERTS	4800	430	320
Total Sulphur	%	0.005	MCERTS	0.485	0.043	0.032
Ammoniacal Nitrogen as NH ₄ ⁺	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5
Ammonium as NH ₄ ⁺ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Organic Matter	%	0.1	MCERTS	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	-	-	-
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	-	-
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as NO ₃ (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	< 5.0

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-

Analytical Report Number: 25-018494
 Project / Site name: High Moor Farm, Clitheroe
 Your Order No: 1134 02

Lab Sample Number	510624			510625			510626		
Sample Reference	TP3			TP6			TP10		
Sample Number	None Supplied			None Supplied			None Supplied		
Water Matrix	N/A			N/A			N/A		
Depth (m)	1.80			1.60			1.40		
Date Sampled	10/04/2025			10/04/2025			10/04/2025		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status						

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	-	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	-	-
Chromium (III)	mg/kg	1	NONE	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-

Magnesium (leachate equivalent)	mg/l	2.5	NONE	5.8	< 2.5	< 2.5
Magnesium (water soluble)	mg/kg	5	NONE	12	< 5.0	< 5.0

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	-
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	-
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	-
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	-	-	-
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	-	-	-
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	-	-
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	-	-
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	-	-	-

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	-	-
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	-	-
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	-	-	-
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	-	-	-
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	-	-	-
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-	-
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-	-
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	-	-	-

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	-	-	-
Benzene	µg/kg	5	MCERTS	-	-	-
Toluene	µg/kg	5	MCERTS	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	-
p & m-Xylene	µg/kg	8	MCERTS	-	-	-
o-Xylene	µg/kg	5	MCERTS	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number : 25-018494

Project / Site name: High Moor Farm, Clitheroe

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
510619	TP1	None Supplied	0.1	Brown loam and clay with gravel and vegetation
510620	TP2	None Supplied	0.4	Brown clay and sand with gravel and vegetation
510621	TP7	None Supplied	0.2	Brown loam and clay with gravel and vegetation
510622	TP10	None Supplied	0.4	Brown loam and clay with gravel and vegetation
510623	TP2	None Supplied	1.2	Brown clay and sand with gravel and stones
510624	TP3	None Supplied	1.8	Brown clay and sand with gravel
510625	TP6	None Supplied	1.6	Brown clay and sand with gravel
510626	TP10	None Supplied	1.4	Brown clay and loam with vegetation and gravel

Analytical Report Number : 25-018494

Project / Site name: High Moor Farm, Clitheroe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L023B	D	MCERTS
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L023B	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
TPH Chromatogram in soil	TPH Chromatogram in soil	In-house method	L064B	D	NONE
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	MCERTS
Water Soluble Nitrate (leachate equivalent)	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-B2/C-04579.08, 2:1 extraction	L078-PL	W	NONE

Analytical Report Number : 25-018494

Project / Site name: High Moor Farm, Clitheroe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Nitrate, water soluble, in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL/L130B	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L009B	D	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

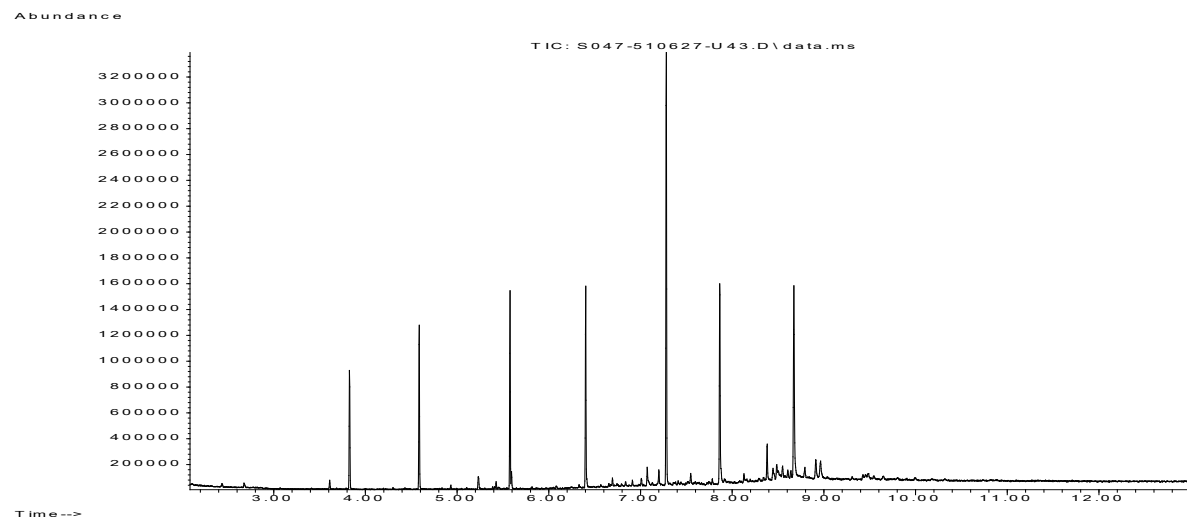
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

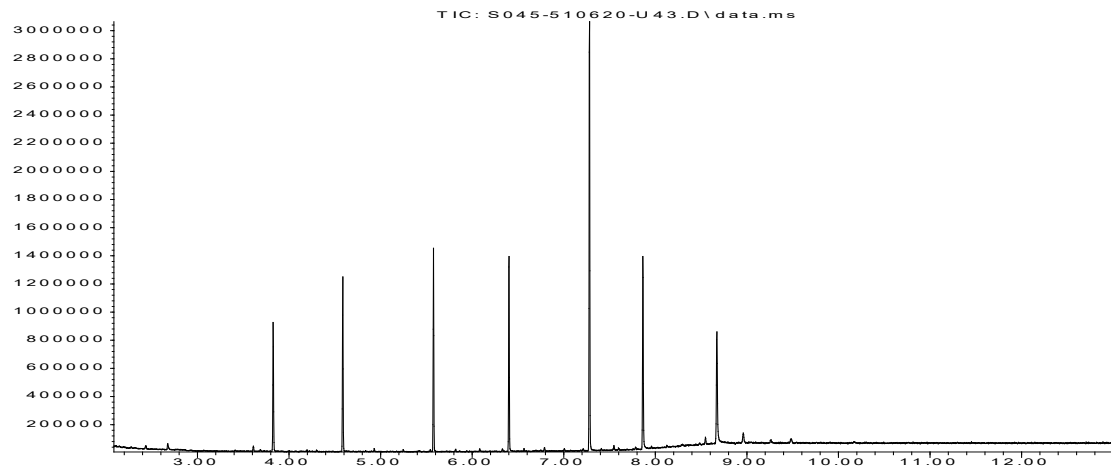
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The result for sum should be interpreted with caution

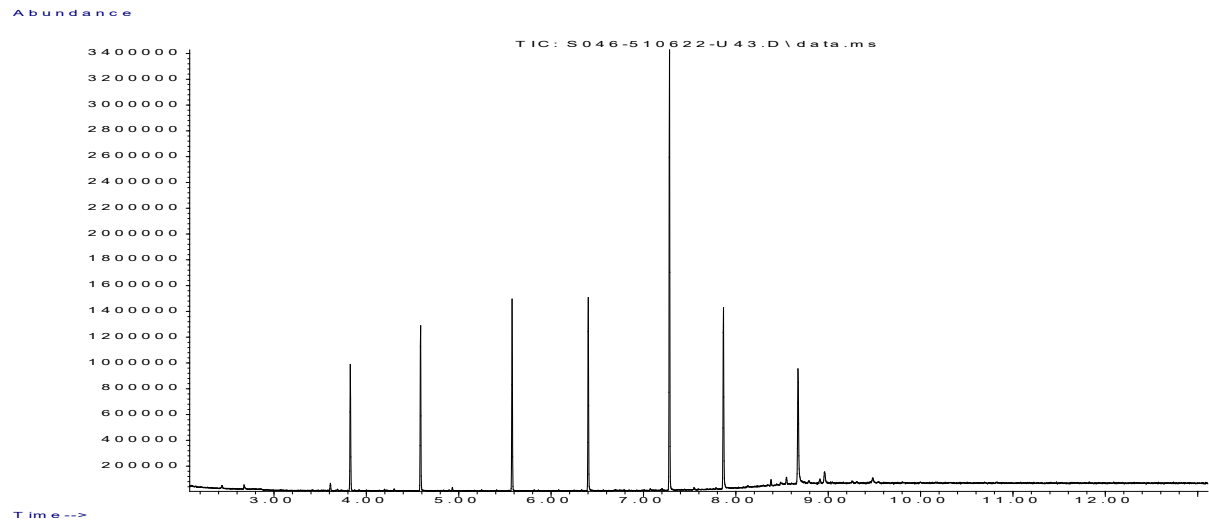


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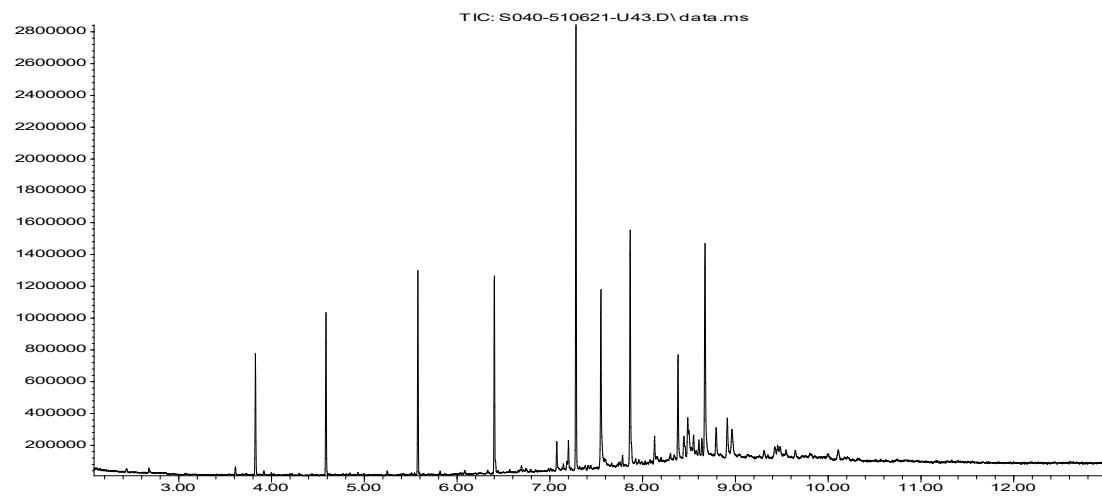
Abundance



Time-->



Abundance



Time-->



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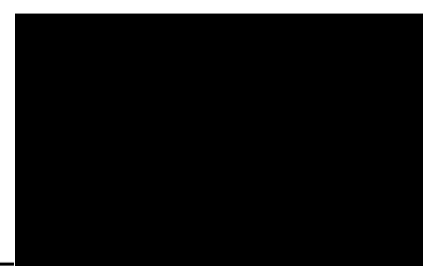
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Analytical Report Number : 25-017783

Project / Site name:	High Moor Farm Clitheroe	Samples received on:	09/04/2025
Your job number:	1134 02	Samples instructed on/ Analysis started on:	09/04/2025
Your order number:	1134 02	Analysis completed by:	15/04/2025
Report Issue Number:	1	Report issued on:	15/04/2025
Samples Analysed:	10:1 WAC sample		

Signe



Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

Excel copies of reports are only valid when accompanied by this PDF certificate.

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 25-017783
Project / Site name: High Moor Farm Clitheroe
Your Order No: 1134 02

Lab Sample Number	507227			
Sample Reference	WS6			
Sample Number	None Supplied			
Water Matrix	N/A			
Depth (m)	0.50			
Date Sampled	02/04/2025			
Time Taken	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	20
Total mass of sample received	kg	0.1	NONE	2

General Inorganics

pH (L005B)	pH Units	N/A	MCERTS	7.4
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.9
Loss on Ignition @ 450°C	%	0.2	MCERTS	4.4
Acid Neutralisation Capacity	+/- mmol/kg	-9999	NONE	1.7

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05
Coronene	mg/kg	0.05	NONE	< 0.05

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.85
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Petroleum Hydrocarbons

Mineral Oil (EC10 - EC40) <small>EH_CU_1D_AL</small>	mg/kg	10	NONE	< 10
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VOCs

Benzene	µg/kg	5	MCERTS	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0
o-Xylene	µg/kg	5	MCERTS	< 5.0

Total BTEX	µg/kg	10	MCERTS	< 10
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Analytical Report Number: 25-017783
Project / Site name: High Moor Farm Clitheroe
Your Order No: 1134 02

Lab Sample Number	507227			
Sample Reference	WS6			
Sample Number	None Supplied			
Water Matrix	N/A			
Depth (m)	0.50			
Date Sampled	02/04/2025			
Time Taken	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001
Total PCBs	mg/kg	0.007	MCERTS	< 0.007

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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Waste Acceptance Criteria Analytical Results							
Report No:	25-017783						
				Client: REMADALT			
Location	High Moor Farm Clitheroe						
Lab Reference (Sample Number)	507227			Landfill Waste Acceptance Criteria			
Sampling Date	02/04/2025			Limits			
Sample ID	WS6			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)	0.50						
Solid Waste Analysis							
TOC (%)**	0.9			3%	5%	6%	
Loss on Ignition (%) **	4.4			--	--	10%	
BTEX (µg/kg) **	< 10			6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007			1	--	--	
Mineral Oil (mg/kg) <small>EH_1D_CU_AL</small>	< 10			500	--	--	
Total PAH (WAC-17) (mg/kg)	< 0.85			100	--	--	
pH (units)**	7.4			--	>6	--	
Acid Neutralisation Capacity (mmol / kg)	1.7			--	To be evaluated	To be evaluated	
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.00100			< 0.0100	0.5	2	25
Barium *	0.0198			0.198	20	100	300
Cadmium *	< 0.000100			< 0.00100	0.04	1	5
Chromium *	0.0049			0.049	0.5	10	70
Copper *	< 0.00070			< 0.0070	2	50	100
Mercury *	< 0.000500			< 0.00500	0.01	0.2	2
Molybdenum *	< 0.000400			< 0.00400	0.5	10	30
Nickel *	0.0046			0.046	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0090			0.090	4	50	200
Chloride *	0.44			4.4	800	15000	25000
Fluoride*	0.29			2.9	10	150	500
Sulphate *	0.74			7.4	1000	20000	50000
TDS*	9.8			98	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	5.04			50.4	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	80						
Moisture (%)	20						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.				* = UKAS accredited (liquid eluate analysis only)			
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation				** = MCERTS accredited			

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Where colour coding is used on this report, this is for guidance purposes only. This does not constitute a statement of conformity of pass or fail.

Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.



Analytical Report Number : 25-017783

Project / Site name: High Moor Farm Clitheroe

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
507227	WS6	None Supplied	0.5	Brown clay

Analytical Report Number : 25-017783

Project / Site name: High Moor Farm Clitheroe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH at 20°C in soil	Determination of pH in soil by addition of water followed by electrometric measurement	In-house method	L005B	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with hexane followed by GC-MS	In-house method based on USEPA 8082	L027B	D	MCERTS
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1 ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	NONE
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Sample Preparation		In-house method	L043B	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe	In-house method based on Guidance on Sampling and Testing of Wastes to Meet Landfill Waste Acceptance	L046B	W	NONE
Loss on ignition of soil @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	In-house method	L047-PL	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088-PL	D/W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025



Analytical Report Number : 25-017783

Project / Site name: High Moor Farm Clitheroe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution



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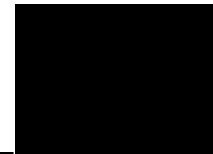
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Analytical Report Number : 25-018496

Project / Site name:	High Moor Farm, Clitheroe	Samples received on:	11/04/2025
Your job number:	1134 02	Samples instructed on/ Analysis started on:	11/04/2025
Your order number:	1134 02	Analysis completed by:	25/04/2025
Report Issue Number:	1	Report issued on:	25/04/2025
Samples Analysed:	2 10:1 WAC samples		

Signed:



Rafał Szczepańczyk
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

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Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 25-018496
 Project / Site name: High Moor Farm, Clitheroe
 Your Order No: 1134 02

Lab Sample Number				510627	510628
Sample Reference				TP1	TP2
Sample Number				None Supplied	None Supplied
Water Matrix				N/A	N/A
Depth (m)				0.10	0.40
Date Sampled				10/04/2025	10/04/2025
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	27	20
Total mass of sample received	kg	0.1	NONE	2	2

General Inorganics

pH (L005B)	pH Units	N/A	MCERTS	6.4	7.8
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	4.6	0.9
Loss on Ignition @ 450°C	%	0.2	MCERTS	11	3.5
Acid Neutralisation Capacity	mmol/kg +/-	-9999	NONE	-3.3	7

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.19	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.44	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.42	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.18	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.28	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.33	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.12	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.23	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.12	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.15	< 0.05
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	2.44	< 0.85
-------------------	-------	------	------	------	--------

Petroleum Hydrocarbons

Mineral Oil (EC10 - EC40) EH_CU_1D_AL	mg/kg	10	NONE	< 10	< 10
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VOCs

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0

Total BTEX	µg/kg	10	MCERTS	< 10	< 10
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Analytical Report Number: 25-018496
 Project / Site name: High Moor Farm, Clitheroe
 Your Order No: 1134 02

Lab Sample Number				510627	510628
Sample Reference				TP1	TP2
Sample Number				None Supplied	None Supplied
Water Matrix				N/A	N/A
Depth (m)				0.10	0.40
Date Sampled				10/04/2025	10/04/2025
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	< 0.001
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	< 0.007

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

i2 Analytical

7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	25-018496					
	Client: REMADALT					
Location	High Moor Farm, Clitheroe					
Lab Reference (Sample Number)	510627					
Sampling Date	10/04/2025					
Sample ID	TP1					
Depth (m)	0.10					
				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Solid Waste Analysis						
TOC (%)**	4.6			3%	5%	6%
Loss on Ignition (%) **	11			--	--	10%
BTEX (µg/kg) **	< 10			6000	--	--
Sum of PCBs (mg/kg) **	< 0.007			1	--	--
Mineral Oil (mg/kg) <small>EH, LD, CU, AL</small>	< 10			500	--	--
Total PAH (WAC-17) (mg/kg)	2.44			100	--	--
pH (units)**	6.4			--	>6	--
Acid Neutralisation Capacity (mmol / kg)	-3.3			--	To be evaluated	To be evaluated
Eluate Analysis	10:1		10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.00377		0.0377	0.5	2	25
Barium *	0.00571		0.0571	20	100	300
Cadmium *	< 0.000100		< 0.00100	0.04	1	5
Chromium *	0.0017		0.017	0.5	10	70
Copper *	0.0082		0.082	2	50	100
Mercury *	< 0.000500		< 0.00500	0.01	0.2	2
Molybdenum *	< 0.000400		< 0.00400	0.5	10	30
Nickel *	0.0038		0.038	0.4	10	40
Lead *	0.0015		0.015	0.5	10	50
Antimony *	0.0020		0.020	0.06	0.7	5
Selenium *	< 0.0040		< 0.040	0.1	0.5	7
Zinc *	0.0083		0.083	4	50	200
Chloride *	0.98		9.8	800	15000	25000
Fluoride*	0.27		2.7	10	150	500
Sulphate *	1.9		19	1000	20000	50000
TDS*	18		180	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-
DOC	12.2		122	500	800	1000
Leach Test Information						
Stone Content (%)	< 0.1					
Sample Mass (kg)	2.0					
Dry Matter (%)	73					
Moisture (%)	27					
Results are expressed on a dry weight basis, after correction for moisture content where applicable.				* = UKAS accredited (liquid eluate analysis only)		
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation				** = MCERTS accredited		

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Where colour coding is used on this report, this is for guidance purposes only. This does not constitute a statement of conformity of pass or fail.
Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

i2 Analytical

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Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	25-018496					
	Client: REMADALT					
Location	High Moor Farm, Clitheroe					
Lab Reference (Sample Number)	510628			Landfill Waste Acceptance Criteria		
Sampling Date	10/04/2025			Limits		
Sample ID	TP2			Inert Waste Landfill	Stable Non- reactive HAZARDOUS waste in non- hazardous Landfill	Hazardous Waste Landfill
Depth (m)	0.40					
Solid Waste Analysis						
TOC (%)**	0.9			3%	5%	6%
Loss on Ignition (%) **	3.5			--	--	10%
BTEX (µg/kg) **	< 10			6000	--	--
Sum of PCBs (mg/kg) **	< 0.007			1	--	--
Mineral Oil (mg/kg) <small>EH, LD, CU, AL</small>	< 10			500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.85			100	--	--
pH (units)**	7.8			--	>6	--
Acid Neutralisation Capacity (mmol / kg)	7.0			--	To be evaluated	To be evaluated
Eluate Analysis						
	10:1			10:1	Limit values for compliance leaching test	
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg		using BS EN 12457-2 at L/S 10 l/kg (mg/kg)	
Arsenic *	0.00181			0.0181	0.5	2
Barium *	0.0149			0.149	20	100
Cadmium *	0.000151			0.00151	0.04	1
Chromium *	0.0031			0.031	0.5	10
Copper *	0.0017			0.017	2	50
Mercury *	< 0.000500			< 0.00500	0.01	0.2
Molybdenum *	< 0.000400			< 0.00400	0.5	10
Nickel *	0.0033			0.033	0.4	10
Lead *	< 0.0010			< 0.010	0.5	10
Antimony *	< 0.0017			< 0.017	0.06	0.7
Selenium *	< 0.0040			< 0.040	0.1	0.5
Zinc *	0.012			0.12	4	50
Chloride *	0.64			6.4	800	15000
Fluoride*	0.50			5.0	10	150
Sulphate *	1.6			16	1000	20000
TDS*	38			380	4000	60000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-
DOC	5.57			55.7	500	800
Leach Test Information						
Stone Content (%)	< 0.1					
Sample Mass (kg)	2.0					
Dry Matter (%)	80					
Moisture (%)	20					
Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)						
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited						

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Where colour coding is used on this report, this is for guidance purposes only. This does not constitute a statement of conformity of pass or fail.
Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.



Analytical Report Number : 25-018496

Project / Site name: High Moor Farm, Clitheroe

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
510627	TP1	None Supplied	0.1	Brown loam and clay with gravel and vegetation
510628	TP2	None Supplied	0.4	Brown clay and sand with gravel and vegetation

Analytical Report Number : 25-018496

Project / Site name: High Moor Farm, Clitheroe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH at 20°C in soil	Determination of pH in soil by addition of water followed by electrometric measurement	In-house method	L005B	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with hexane followed by GC-MS	In-house method based on USEPA 8082	L027B	D	MCERTS
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	NONE
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Sample Preparation		In-house method	L043B	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance	L046B	W	NONE
Loss on ignition of soil @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	In-house method	L047-PL	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088-PL	D/W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025



Analytical Report Number : 25-018496

Project / Site name: High Moor Farm, Clitheroe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

APPENDIX F

Laboratory Geotechnical Tests



Laboratory Report



Contract Number: 78340

Client Ref: 1373.02

Client PO: 1373.02

Date Received: 22-04-2025

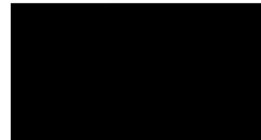
Date Completed: 02-05-2025

Report Date: 02-05-2025

Client: **Remada Limited**

This report has been checked and approved by:

Contract Title: **High Moor Farm, Clitheroe**
For the attention of: **Krysia Szybut**



Brendan Evans
Senior Office Administrator

Description	Qty
Determination of water content BS EN ISO 17892-1:2014 - @ Non Accredited Test	8
4 Point Liquid & Plastic Limit.. BS EN ISO 17892-12 - * UKAS	8
Particle Size Distribution BS EN ISO 17892-4 : 5.1 - * UKAS	2

Notes: Observations and Interpretations are outside the UKAS Accreditation

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:

Brendan Evans (Senior Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)

Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)

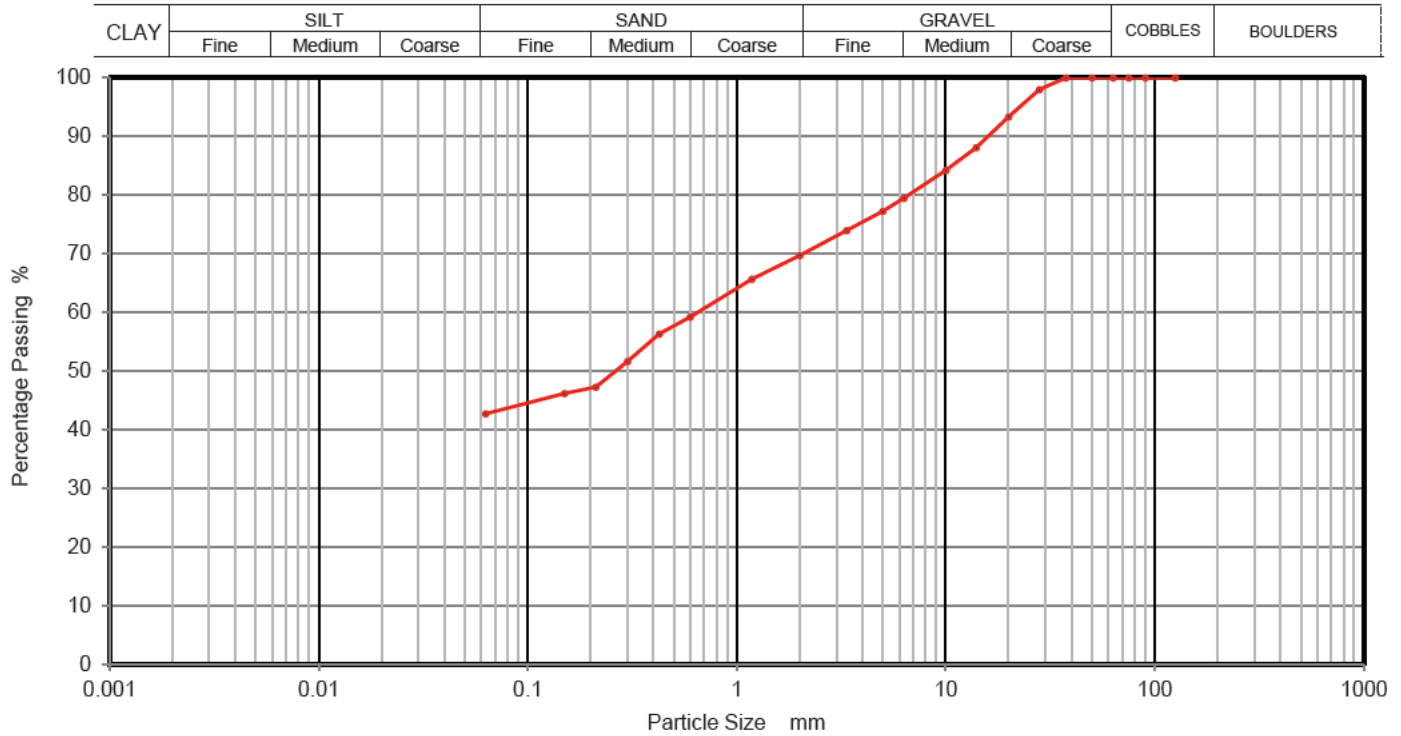
Wayne Honey (HR & HSE Manager)



PARTICLE SIZE DISTRIBUTION
BS EN ISO 17892-4:2016
Wet Sieve, Clause 5.2

Contract Number	78340
Borehole/Pit No.	TP4
Sample No.	
Depth Top	2.10
Depth Base	
Sample Type	B

Project Name	High Moor Farm, Clitheroe
Sample Description	Grey fine to coarse sandy fine to coarse gravelly SILT/ CLAY
Date Tested	18/04/2025



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	98		
20	93		
14	88		
10	84		
6.3	79		
5	77		
3.35	74		
2	70		
1.18	66		
0.63	59		
0.425	56		
0.30	52		
0.20	47		
0.15	46		
0.063	43		

Sample Proportions	% dry mass
Cobbles	0
Gravel	30
Sand	27
Silt and Clay	43

Remarks
 Preparation and testing in accordance with BS17892 unless noted below

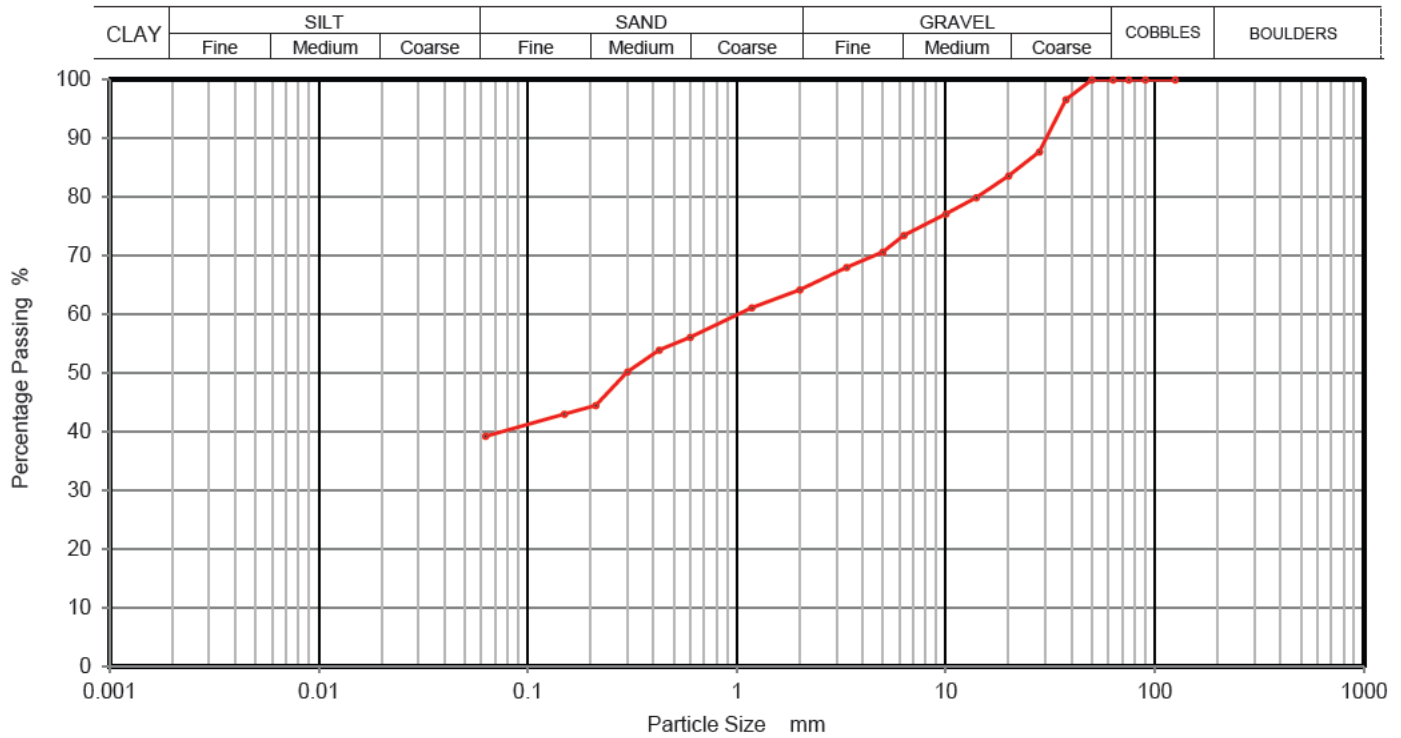
Operator
Jordan. W



PARTICLE SIZE DISTRIBUTION
BS EN ISO 17892-4:2016
Wet Sieve, Clause 5.2

Contract Number	78340
Borehole/Pit No.	TP12
Sample No.	
Depth Top	1.50
Depth Base	
Sample Type	B

Project Name	High Moor Farm, Clitheroe
Sample Description	Grey fine to coarse sandy fine to coarse gravelly SILT/ CLAY
Date Tested	18/04/2025



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	97		
28	88		
20	84		
14	80		
10	77		
6.3	73		
5	71		
3.35	68		
2	64		
1.18	61		
0.63	56		
0.425	54		
0.30	50		
0.20	44		
0.15	43		
0.063	39		

Sample Proportions	% dry mass
Cobbles	0
Gravel	36
Sand	25
Silt and Clay	39

Remarks
 Preparation and testing in accordance with BS17892 unless noted below

Operator
Jordan. W



20.0 APPENDIX G – EA FLOOD MAP FOR PLANNING

Flood map for planning

Your reference	Location (easting/northing)	Created
Unspecified	375144/441622	10 December 2025 15:32

Your selected location is in flood zone 3, an area with a high probability of flooding.

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see <https://www.gov.uk/guidance/flood-risk-assessment-standing-advice>)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2025 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

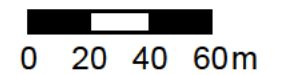
Your reference
Unspecified

Location (easting/northing)
375144/441622

Scale
1:2,500

Created
10 Dec 2025 15:32

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area





21.0 APPENDIX H – UNITED UTILITIES CORRESPONDENCE



**United Utilities Water Limited
Planning, Landscape and Ecology**
2nd Floor, Grasmere House
Lingley Mere Business Park
Lingley Green Avenue
Warrington
WA5 3LP

Planning.liaison@uuplc.co.uk

Ribble Valley Borough Council
Council Officers, Church Walk
Clitheroe
BB7 2RA

Your ref: 3/2020/0601
Our ref: DC/20/2992V2
Date: 15-FEB-21

Dear Sir/Madam,

Location: Land at Highmoor Farm Clitheroe BB7 1PN

Proposal: Outline planning application for the construction of up to 125 dwellings

With regards to the above development proposal, United Utilities Water Limited ('United Utilities') wishes to provide the following comments.

Drainage

In accordance with the National Planning Policy Framework (NPPF) and the National Planning Practice Guidance (NPPG), the site should be drained on a separate system with foul water draining to the public sewer and surface water draining in the most sustainable way.

Following our review of the submitted Flood Risk Assessment, we can confirm the proposals are acceptable in principle to United Utilities and therefore should planning permission be granted we request the following condition is attached to any subsequent Decision Notice:

Condition 1 – Surface water

The drainage for the development hereby approved, shall be carried out in accordance with principles set out in the submitted Flood Risk Assessment (Ref No.: 18522, Dated: Jan 2021) which was prepared by Topping Engineers. No surface water will be permitted to drain directly or indirectly into the public sewer. Any variation to the discharge of foul shall be agreed in writing by the Local Planning Authority prior to the commencement of the development. The development shall be completed in accordance with the approved details.

Reason: To ensure a satisfactory form of development and to prevent an undue increase in surface water run-off and to reduce the risk of flooding.

Condition 2 – Foul water

Foul and surface water shall be drained on separate systems.

Reason: To secure proper drainage and to manage the risk of flooding and pollution.

The applicant can discuss any of the above with Developer Engineer, **Rob Brenton**, by email at wastewaterdeveloperservices@uuplc.co.uk.

Please note, United Utilities are not responsible for advising on rates of discharge to the local watercourse system. This is a matter for discussion with the Lead Local Flood Authority and / or the Environment Agency (if the watercourse is classified as main river).

If the applicant intends to offer wastewater assets forward for adoption by United Utilities, the proposed detailed design will be subject to a technical appraisal by an Adoptions Engineer as we need to be sure that the proposal meets the requirements of Sewers for Adoption and United Utilities' Asset Standards. The detailed layout should be prepared with consideration of what is necessary to secure a development to an adoptable standard. This is important as drainage design can be a key determining factor of site levels and layout. The proposed design should give consideration to long term operability and give United Utilities a cost effective proposal for the life of the assets. Therefore, should this application be approved and the applicant wishes to progress a Section 104 agreement, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 agreement, has been assessed and accepted in writing by United Utilities. Any works carried out prior to the technical assessment being approved is done entirely at the developers own risk and could be subject to change.

Management and Maintenance of Sustainable Drainage Systems

Without effective management and maintenance, sustainable drainage systems can fail or become ineffective. As a provider of wastewater services, we believe we have a duty to advise the Local Planning Authority of this potential risk to ensure the longevity of the surface water drainage system and the service it provides to people. We also wish to minimise the risk of a sustainable drainage system having a detrimental impact on the public sewer network should the two systems interact. We therefore recommend the Local Planning Authority include a condition in their Decision Notice regarding a management and maintenance regime for any sustainable drainage system that is included as part of the proposed development.

For schemes of 10 or more units and other major development, we recommend the Local

Planning Authority consults with the Lead Local Flood Authority regarding the exact wording of any condition. You may find the below a useful example:

Prior to occupation of the development a sustainable drainage management and maintenance plan for the lifetime of the development shall be submitted to the local planning authority and agreed in writing. The sustainable drainage management and maintenance plan shall include as a minimum:

- a. Arrangements for adoption by an appropriate public body or statutory undertaker, or, management and maintenance by a resident's management company; and*
- b. Arrangements for inspection and ongoing maintenance of all elements of the sustainable drainage system to secure the operation of the surface water drainage scheme throughout its lifetime.*

The development shall subsequently be completed, maintained and managed in accordance with the approved plan.

Reason: To ensure that management arrangements are in place for the sustainable drainage system in order to manage the risk of flooding and pollution during the lifetime of the development.

Please note United Utilities cannot provide comment on the management and maintenance of an asset that is owned by a third party management and maintenance company. We would not be involved in the discharge of the management and maintenance condition in these circumstances.

Water Supply

Our water mains may need extending to serve any development on this site and the applicant may be required to pay a contribution.

If the applicant intends to obtain a water supply from United Utilities for the proposed development, we strongly recommend they engage with us at the earliest opportunity. If reinforcement of the water network is required to meet the demand, this could be a significant project and the design and construction period should be accounted for.

To discuss a potential water supply or any of the water comments detailed above, the applicant can contact the team at [**DeveloperServicesWater@uuplc.co.uk**](mailto:DeveloperServicesWater@uuplc.co.uk).

Please note, all internal pipework must comply with current Water Supply (water fittings) Regulations 1999.

United Utilities' Property, Assets and Infrastructure

Where United Utilities' assets exist, the level of cover to the water mains and public sewers must not be compromised either during or after construction.

For advice regarding protection of United Utilities assets, the applicant should contact the teams as follows:

Water assets – DeveloperServicesWater@uuplc.co.uk

Wastewater assets – WastewaterDeveloperServices@uuplc.co.uk

It is the applicant's responsibility to investigate the possibility of any United Utilities' assets potentially impacted by their proposals and to demonstrate the exact relationship between any United Utilities' assets and the proposed development.

A number of providers offer a paid for mapping service including United Utilities. To find out how to purchase a sewer and water plan from United Utilities, please visit the Property Searches website; <https://www.unitedutilities.com/property-searches/>

You can also view the plans for free. To make an appointment to view our sewer records at your local authority please contact them direct, alternatively if you wish to view the water and the sewer records at our Lingley Mere offices based in Warrington please ring [0370 751 0101](tel:03707510101) to book an appointment.

Due to the public sewer transfer in 2011, not all sewers are currently shown on the statutory sewer records and we do not always show private pipes on our plans. If a sewer is discovered during construction; please contact a Building Control Body to discuss the matter further.

Should this planning application be approved the applicant should contact United Utilities regarding a potential water supply or connection to public sewers. Additional information is available on our website <http://www.unitedutilities.com/builders-developers.aspx>

Yours faithfully

Tracy Churchman
United Utilities
Planning, Landscape and Ecology



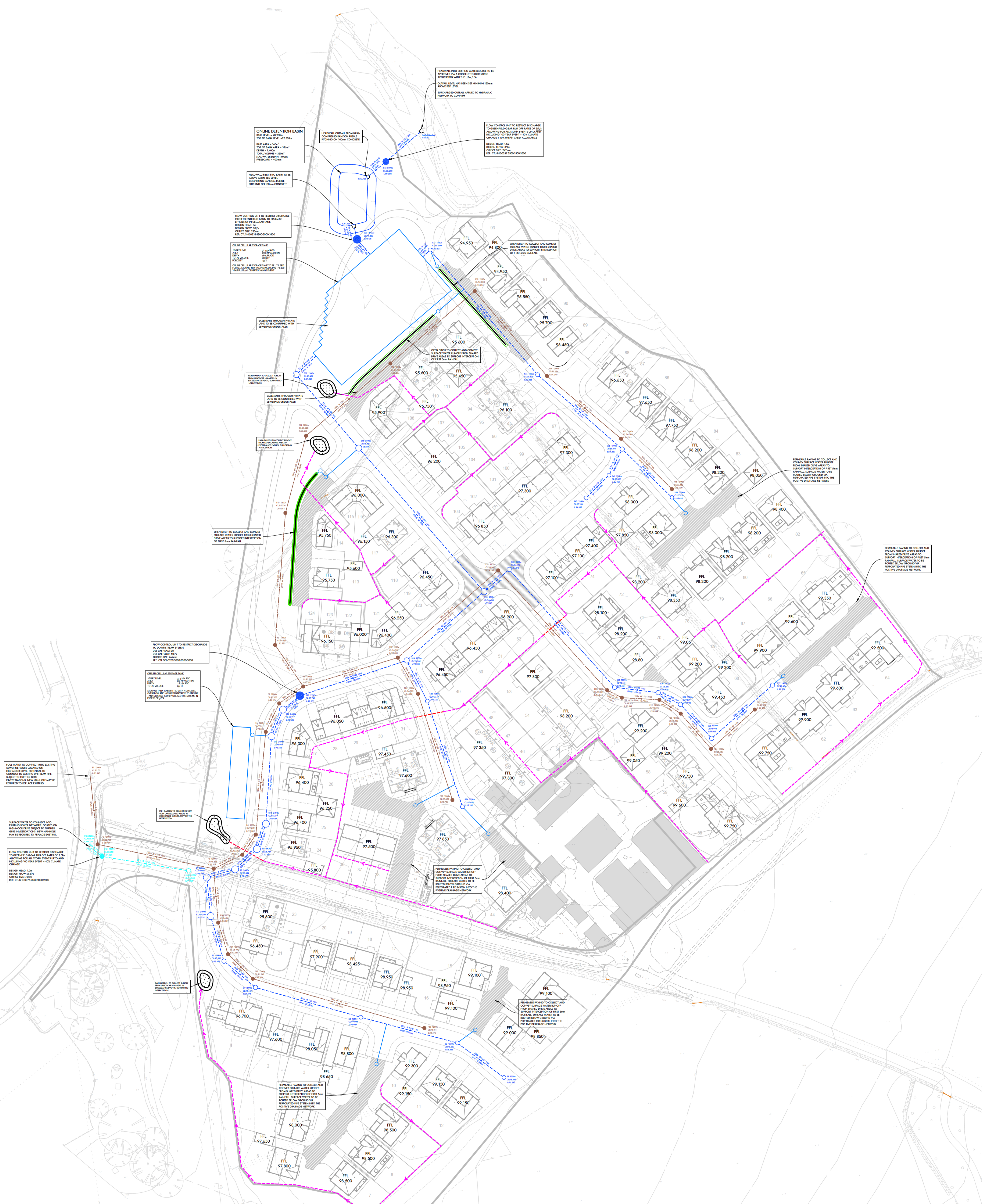
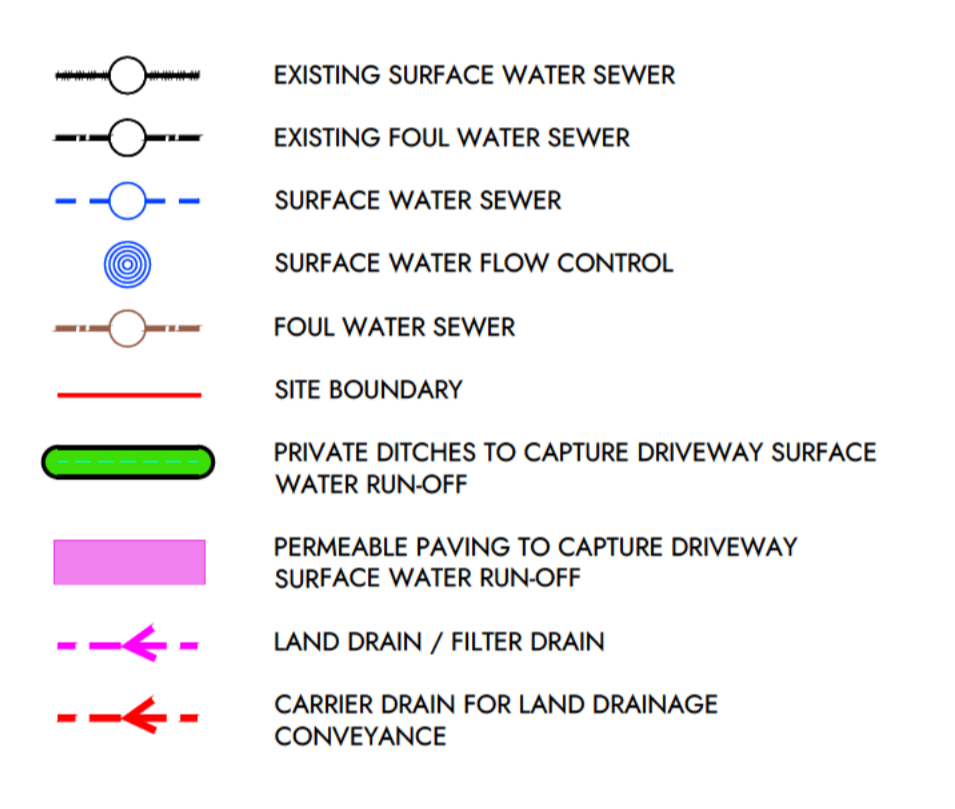
22.0 APPENDIX I – PROPOSED DRAINAGE LAYOUT

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.
3. ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.
4. LOCATION AND LEVELS OF EXISTING PUBLIC SEWERS BASED ON WATER AUTHORITY SEWER RECORDS. SEWERS TO BE FULLY SURVEYED, ALL LOCATIONS TO BE CONFIRMED.
5. SETTING OUT SHALL BE UNDERTAKEN USING ONLY THE INFORMATION GIVEN.
6. ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION GUIDANCE AND WHERE APPLICABLE UNITED UTILITIES DETAILS.
7. THE MINIMUM GRAVITY PIPE DIAMETER UNDER ADOPTABLE HIGHWAYS SHALL BE 150mm.
8. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL INFORMATION GIVEN WITH REGARDS TO EXISTING SERVICES AND DRAINAGE CONNECTIONS ETC. PRIOR TO COMMENCING THE WORKS. THE CONTRACTOR SHALL ADHERE TO THE CDM REGULATIONS AT ALL TIMES.
9. EXISTING FLOWS IN WATER COURSES, SEWERS AND LAND DRAINS SHALL BE MAINTAINED AT ALL TIMES.
10. ALL MATERIALS TO BEAR THE RELEVANT B.S. KITEMARK AND COMPLY FULLY WITH THE SPECIFICATIONS. ALL CONCRETE & CONCRETE PRODUCTS MUST USE SULPHATE RESISTANT CEMENT (UNLESS THE SITE INVESTIGATION REPORT PROVES THAT SULPHATE ATTACK FROM SOILS AND GROUNDWATER WILL NOT OCCUR TO WITHSTAND A CLASS).
11. ALL OPENING NOTICES ETC. AS REQUIRED UNDER HIGHWAYS ACTS ETC. ARE TO BE OBTAINED PRIOR TO COMMENCEMENT OF WORKS. ALL WORKS ARE TO BE INSPECTED BY L.A., NHBC OR THE NETWORK OPERATOR AS APPLICABLE.
12. WHERE "ULTRA RIB" UPVC PIPES (OR SIMILAR APPROVED) ARE USED IN ADOPTABLE DRAINAGE THEY SHALL STILL BE HANDLED AND LAID IN ACCORDANCE WITH THE SPECIFICATION AND GUIDANCE ISSUED BY THE HIGH PERFORMANCE PIPE ASSOCIATION.
13. A CLASS 5 BED AND SURROUND MUST BE USED FOR SUCH PIPES. TRENCH BACKFILL IN HIGHWAYS TO WITHIN 1m OF HIGHWAY SHALL, AS DIRECTED BY THE HIGHWAY AUTHORITY BE A SUITABLE GRANULAR MATERIAL ALL IN ACCORDANCE WITH SEWERS FOR ADOPTION CL. 4.3.4.
14. DOMESTIC DRAINAGE SHALL BE TO BUILDING REGULATIONS APPROVED DOCUMENT H. 100mm U.P.V.C. PIPES LAID TO THE FOLLOWING MINIMUM FALLS UNLESS OTHERWISE SHOWN.

FOUL	S.W.
HEAD RUN	1 IN 40
ELSEWHERE	1 IN 60
	1 IN 80
	1 IN 100
15. ALL LATERAL CONNECTIONS FROM THE PRIVATE NETWORK TO BE 150mm U.P.V.C. PIPES UNLESS STATED OTHERWISE.
16. ALL GULLY CONNECTIONS TO BE 150mm VITRIFIED UPVC UNLESS NOTED OTHERWISE.
17. MINIMUM COVER TO DRAINAGE SOFFIT LEVEL;

LANDSCAPING	TRAFFICED AREAS	HIGHWAYS
0.600m	0.900m	1.200m
18. CLASS 'S' BEDDING AND SURROUND TO BE USED WHERE MINIMUM COVER IS ACHIEVED.
19. WHERE MINIMUM COVER IS NOT ACHIEVED CLASS 'Z' BEDDING AND SURROUND (CONCRETE ENCASMENT) IS TO BE USED.
20. ANY DAMAGE TO THE EXISTING SEWER NETWORK BECAUSE OF THE DEVELOPMENT SITES ACTIVITIES WILL NEED TO BE RECTIFIED AT THE DEVELOPERS EXPENSE.



STRATEGY DRAWING TO SHOW PROPOSED OUTFALL LOCATIONS, DISCHARGE RATES AND GENERAL AREAS OF ATTENUATION FOR PLANNING PURPOSES ONLY; ALL DETAILS SUBJECT TO DETAILED DESIGN/ S104 ADOPTION PROCESSES AND THEREFORE SUBJECT TO CHANGE

Rev	Date	By	Description
P07	24.03.24	KF	SYSTEM REVISED TO SUIT NEW OUTFALL LOCATION
P06	18.02.24	KF	SYSTEM REVISED TO SUIT NEW OUTFALL LOCATION
P05	28.01.24	KF	MINOR AMENDMENTS
P04	28.01.24	KF	SYSTEM REVISED TO 23 L/s DISCHARGE
P03	27.01.24	NM	CLIMATE CHANGE TO 40% AS PER DECISION NOTICE
P02	22.01.24	KF	LAND DRAINAGE ADDED
P01	20.01.24	NK	FIRST ISSUE

SHAPE ENGINEERING
 Liverpool Innovation Park | Edge Lane | Liverpool | L17 9PQ
 T: 0151 305 0700 www.shapeengineering.co.uk

Client: MORRIS HOMES
 Project: HIGHMOOR FARM, CLITHEROE
 Title: Drainage Strategy Layout - Masterplan

Status	Quality	Description	Structural Stage	Date
KF	PLANNING			20.01.24

Designed By: KF
 Drawn By: KF
 Scale: A0
 Project No.: 2936
 Sheet No.: 2936-SCE-00-00-DR-C-9001



23.0 APPENDIX J – PROPOSED HYDRO-BRAKE® DETAILS

Technical Specification

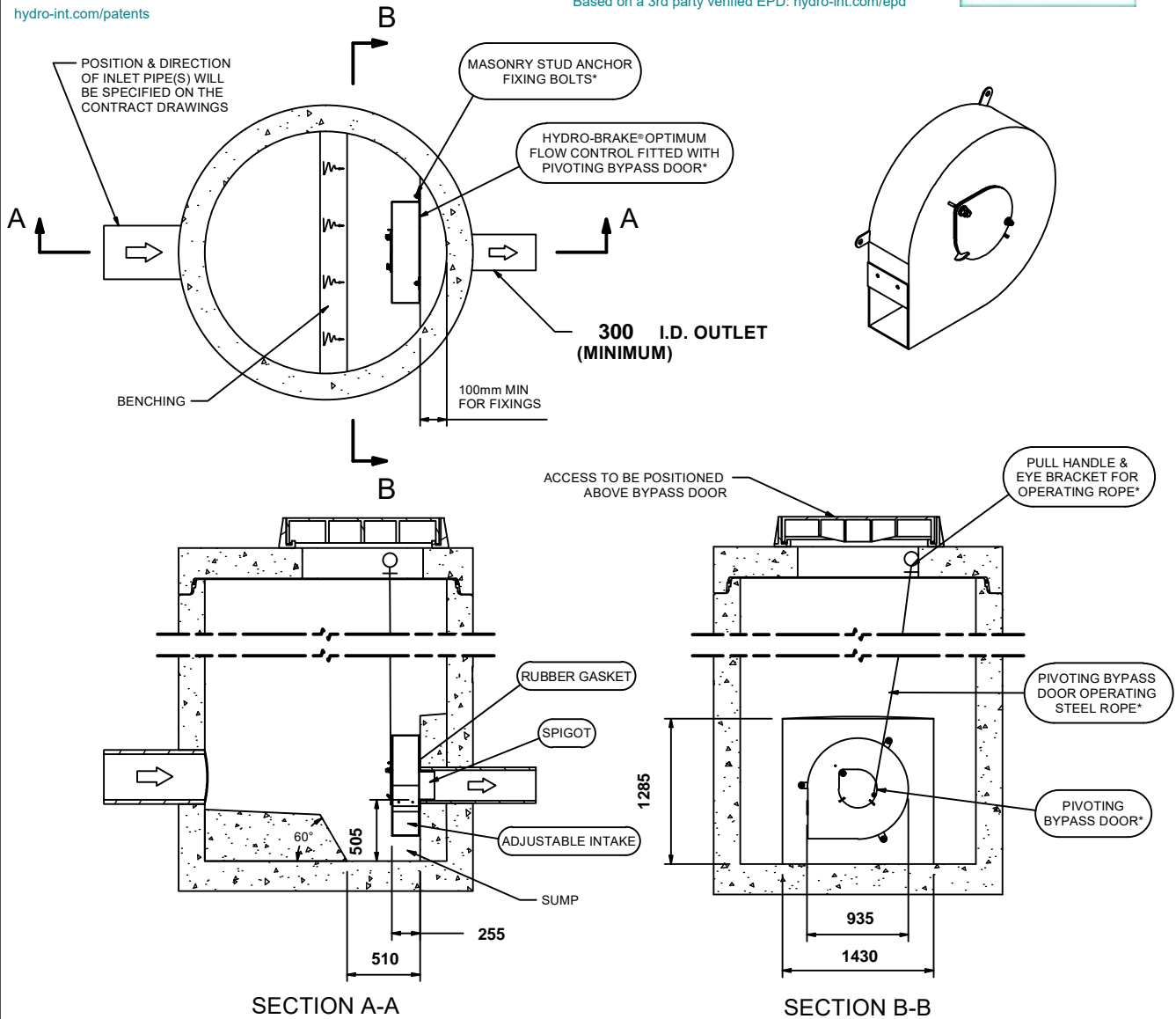
Control Point	Head (m)	Flow (l/s)
Primary Design	1.500	35.000
Flush-Flo™	0.472	35.000
Kick-Flo®	1.032	29.260
Mean Flow		29.875

hydro-int.com/patents

This Hydro-Brake® Optimum includes:

- All in 5 mm Grade 304L stainless steel
- Integral pivoting by-pass door allowing clear line of sight through to outlet, c/w operating rope
- Media blasted for corrosion resistance
- Variable flow rate post installation via adjustable inlet (if necessary)
- Indicative Weight: 85 kg
- Product Carbon Footprint: 379.74 kgCO2e

Based on a 3rd party verified EPD: hydro-int.com/epd



IMPORTANT: ○ LIMIT OF HYDRO INTERNATIONAL SUPPLY
 THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
 FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
 ALL CIVIL AND INSTALLATION WORK BY OTHERS
 * WHERE SUPPLIED
 HYDRO-BRAKE® IS A REGISTERED TRADEMARK FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY
 HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE



The head/flow characteristics of this SHE-0247-3500-1500-3500 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.



DATE	31/03/2026 10:22
SITE	2936
DESIGNER	kieran farrell
REF	S46

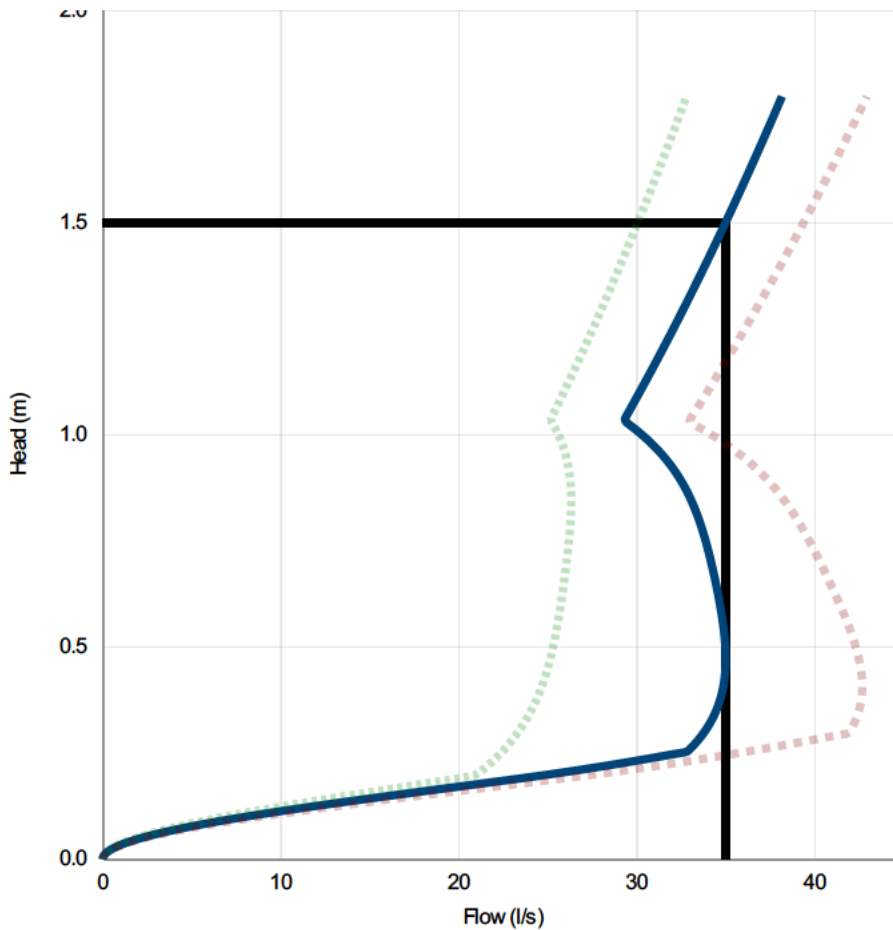
SHE-0247-3500-1500-3500
 Hydro-Brake® Optimum

Technical Specification

Control Point	Original Setting		Minimum Setting		Maximum Setting	
	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
Primary Design	1.500	35.000	1.500	30.068	1.500	39.380
Flush-Flo™	0.472	35.000	0.843	26.322	0.407	42.670
Kick-Flo®	1.032	29.260	1.032	25.130	1.029	32.900
Mean Flow		29.875		23.711		34.609



hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.052	2.332
0.103	8.548
0.155	17.197
0.207	26.277
0.259	32.979
0.310	33.976
0.362	34.582
0.414	34.897
0.466	34.999
0.517	34.950
0.569	34.801
0.621	34.588
0.672	34.333
0.724	34.038
0.776	33.688
0.828	33.247
0.879	32.660
0.931	31.854
0.983	30.743
1.034	29.346
1.086	29.985
1.138	30.659
1.190	31.318
1.241	31.962
1.293	32.593
1.345	33.211
1.397	33.817
1.448	34.412
1.500	34.996

DESIGN ADVICE

The head/flow characteristics of this SHE-0247-3500-1500-3500 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.



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DATE	31/03/2026 10:22
Site	2936
DESIGNER	kieran farrell
Ref	S46

SHE-0247-3500-1500-3500
Hydro-Brake® Optimum

Technical Specification

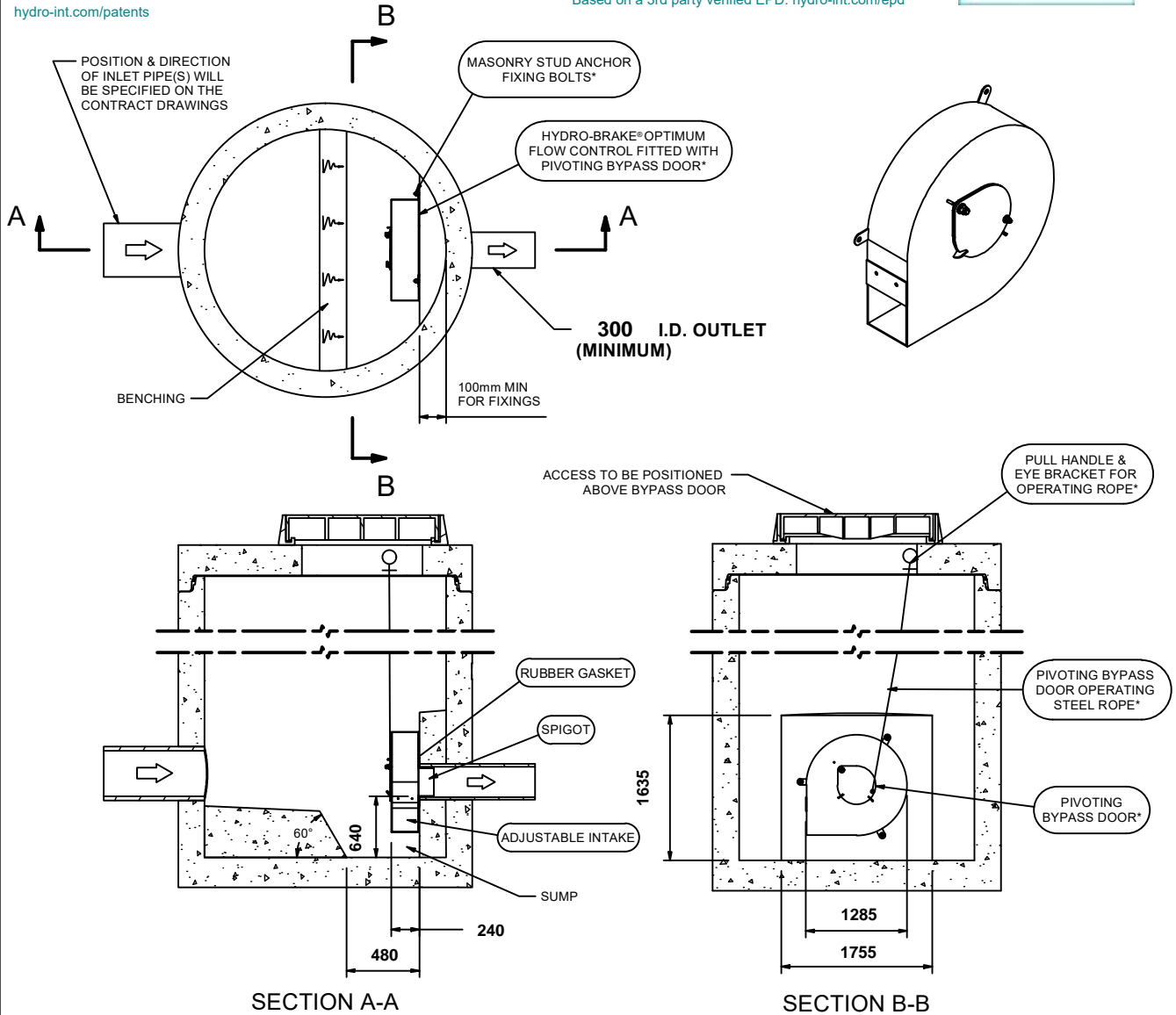
Control Point	Head (m)	Flow (l/s)
Primary Design	3.000	38.000
Flush-Flo™	0.858	37.935
Kick-Flo®	1.799	29.716
Mean Flow		33.134

hydro-int.com/patents

This Hydro-Brake® Optimum includes:

- All in 8 mm Grade 304L stainless steel
- Integral pivoting by-pass door allowing clear line of sight through to outlet, c/w operating rope
- Media blasted for corrosion resistance
- Variable flow rate post installation via adjustable inlet (if necessary)
- Indicative Weight: 235 kg
- Product Carbon Footprint: 1049.19 kgCO2e

Based on a 3rd party verified EPD: hydro-int.com/epd



IMPORTANT: ○ LIMIT OF HYDRO INTERNATIONAL SUPPLY
 THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
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 * WHERE SUPPLIED
 HYDRO-BRAKE® IS A REGISTERED TRADEMARK FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY
 HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE



The head/flow characteristics of this SHE-0233-3800-3000-3800 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.



A DEW COMPANY

DATE	31/03/2026 10:25
SITE	2936
DESIGNER	kieran farrell
REF	S20

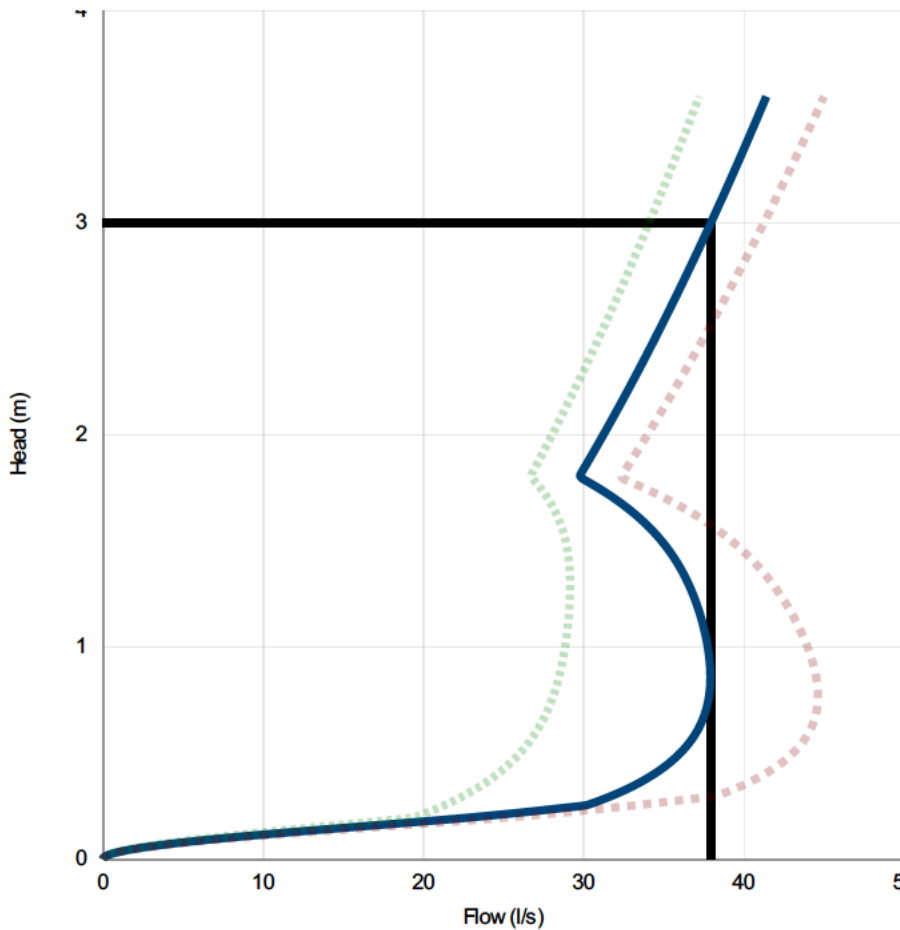
SHE-0233-3800-3000-3800
 Hydro-Brake® Optimum

Technical Specification

Control Point	Original Setting		Minimum Setting		Maximum Setting	
	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
Primary Design	3.000	38.000	3.000	34.117	3.000	41.292
Flush-Flo™	0.858	37.935	1.286	29.179	0.769	44.650
Kick-Flo®	1.799	29.716	1.800	26.676	1.795	32.300
Mean Flow		33.134		27.408		37.350



hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.103	8.217
0.207	24.442
0.310	32.156
0.414	34.680
0.517	36.275
0.621	37.232
0.724	37.738
0.828	37.926
0.931	37.888
1.034	37.686
1.138	37.350
1.241	36.882
1.345	36.253
1.448	35.408
1.552	34.268
1.655	32.739
1.759	30.722
1.862	30.209
1.966	31.002
2.069	31.773
2.172	32.525
2.276	33.258
2.379	33.975
2.483	34.677
2.586	35.363
2.690	36.036
2.793	36.696
2.897	37.343
3.000	37.979

DESIGN ADVICE

The head/flow characteristics of this SHE-0233-3800-3000-3800 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.



The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.



DATE	31/03/2026 10:25
Site	2936
DESIGNER	kieran farrell
Ref	S20

SHE-0233-3800-3000-3800
Hydro-Brake® Optimum

Technical Specification

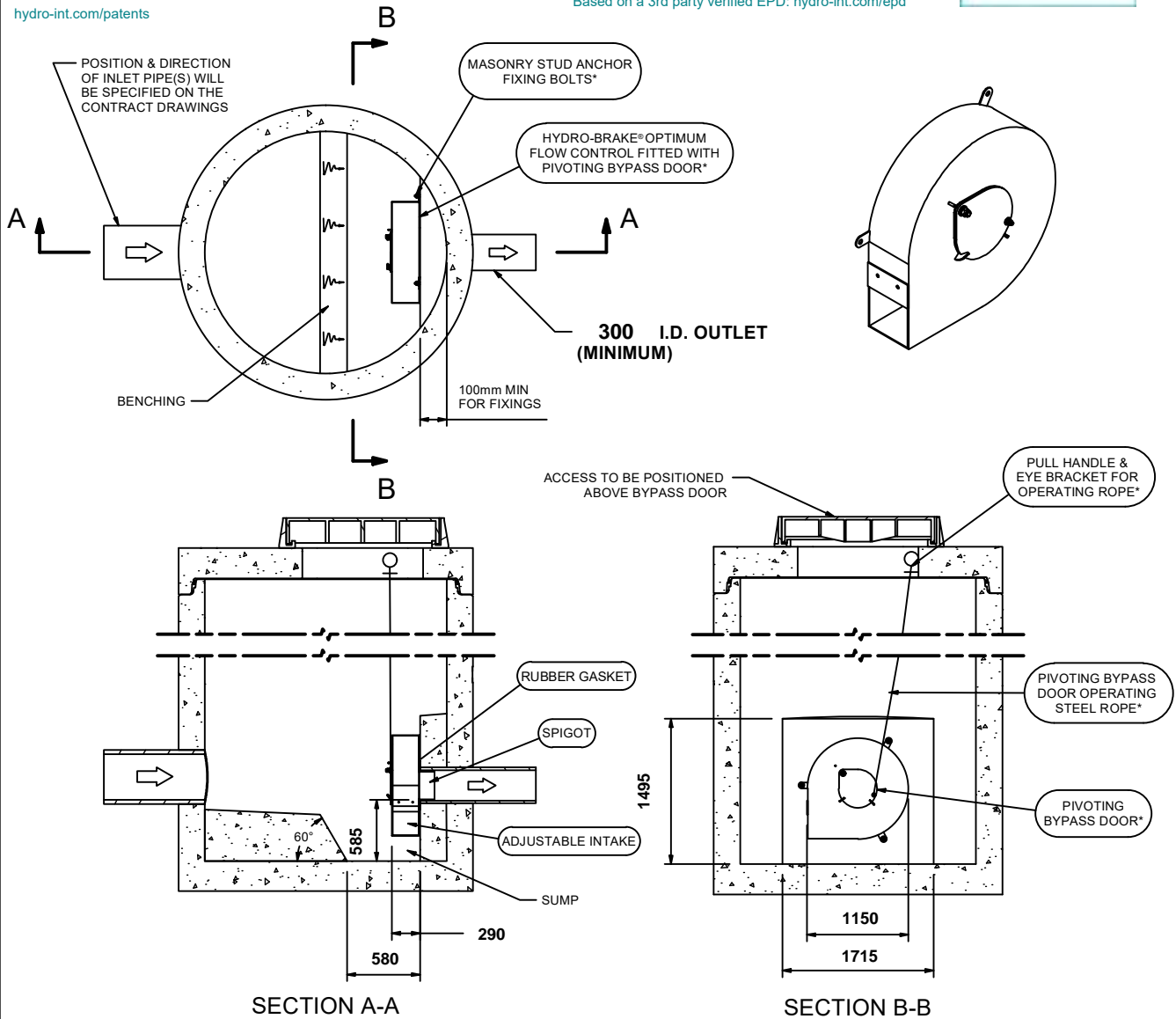
Control Point	Head (m)	Flow (l/s)
Primary Design	2.000	50.000
Flush-Flo™	0.612	49.832
Kick-Flo®	1.330	41.000
Mean Flow		42.935

hydro-int.com/patents

This Hydro-Brake® Optimum includes:

- All in 5 mm Grade 304L stainless steel
- Integral pivoting by-pass door allowing clear line of sight through to outlet, c/w operating rope
- Media blasted for corrosion resistance
- Variable flow rate post installation via adjustable inlet (if necessary)
- Indicative Weight: 130 kg
- Product Carbon Footprint: 562.81 kgCO2e

Based on a 3rd party verified EPD: hydro-int.com/epd



IMPORTANT: ○ LIMIT OF HYDRO INTERNATIONAL SUPPLY
 THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
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 * WHERE SUPPLIED
 HYDRO-BRAKE® IS A REGISTERED TRADEMARK FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY
 HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE



The head/flow characteristics of this SHE-0281-5000-2000-5000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.



DATE	31/03/2026 10:24
SITE	2936
DESIGNER	kieran farrell
REF	S13

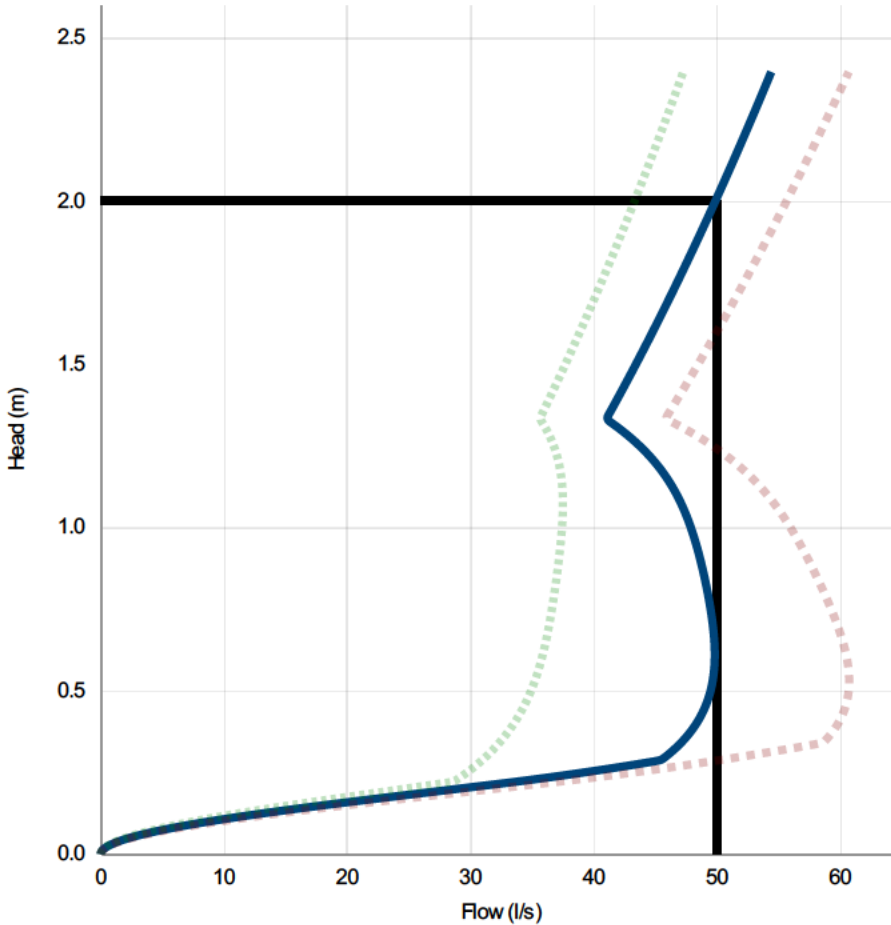
SHE-0281-5000-2000-5000
 Hydro-Brake® Optimum

Technical Specification

Control Point	Original Setting		Minimum Setting		Maximum Setting	
	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
Primary Design	2.000	50.000	2.000	43.325	2.000	55.658
Flush-Flo™	0.612	49.832	1.074	37.508	0.529	60.741
Kick-Flo®	1.330	41.000	1.331	35.600	1.332	45.800
Mean Flow		42.935		34.264		49.662



hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.069	4.378
0.138	15.708
0.207	30.474
0.276	43.625
0.345	47.198
0.414	48.566
0.483	49.363
0.552	49.745
0.621	49.830
0.690	49.711
0.759	49.458
0.828	49.114
0.897	48.696
0.966	48.191
1.034	47.554
1.103	46.711
1.172	45.560
1.241	43.979
1.310	41.836
1.379	41.716
1.448	42.705
1.517	43.671
1.586	44.614
1.655	45.537
1.724	46.440
1.793	47.325
1.862	48.193
1.931	49.045
2.000	49.881

DESIGN ADVICE

The head/flow characteristics of this SHE-0281-5000-2000-5000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.



The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.



DATE	31/03/2026 10:24
Site	2936
DESIGNER	kieran farrell
Ref	S13

SHE-0281-5000-2000-5000
Hydro-Brake® Optimum



24.0 APPENDIX K – SURFACE WATER CALCULATIONS

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.000	Minimum Backdrop Height (m)	0.650
Ratio-R	0.250	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.175	5.00	98.348	1350	375152.585	441486.944	1.766
2	0.000		98.430	1350	375136.780	441498.650	2.045
3	0.139	5.00	97.904	1350	375104.162	441507.340	1.857
4	0.104	5.00	96.169	1500	375068.503	441517.424	1.975
5	0.079	5.00	95.595	1500	375057.846	441526.304	1.748
6	0.000		95.250	2400	375053.313	441541.555	2.515
7	0.015	5.00	95.020	2400	375052.034	441554.621	2.318
8	0.048	5.00	95.534	2400	375061.610	441557.360	2.857
9	0.000	5.00	95.754	2400	375068.966	441564.220	3.102
10	0.000	5.00	95.769	2400	375072.018	441572.775	3.140
11	0.000		95.807	2400	375073.925	441602.403	3.252
12	0.103	5.00	95.717	2400	375077.791	441611.401	3.193
13	0.000	5.00	95.747	2700	375083.542	441616.100	3.242
24	0.174	5.00	97.652	1350	375138.538	441578.532	2.370
25	0.129	5.00	96.647	1350	375126.652	441614.270	1.875
14	0.073	5.00	96.241	1800	375119.676	441628.046	3.858
27	0.132	5.00	99.434	1500	375243.470	441619.678	2.100
28	0.109	5.00	98.991	1500	375222.886	441601.681	1.930
29	0.080	5.00	98.791	1500	375212.291	441613.181	1.886
30	0.000		98.519	1500	375204.772	441617.142	1.699
31	0.159	5.00	98.151	1500	375190.039	441618.938	2.000
32	0.141	5.00	96.416	1500	375154.321	441658.811	2.406
15	0.077	5.00	96.405	2100	375145.843	441651.283	4.934
16	0.120	5.00	95.339	2100	375103.444	441699.849	4.029
17	0.059	5.00	95.417	2100	375082.262	441724.737	4.189
18	0.000		95.361	20	375088.993	441730.995	4.156
34	0.158	5.00	97.516	1200	375209.415	441683.185	1.884
40	0.109	5.00	97.150	1350	375180.394	441683.011	2.253
41	0.102	5.00	97.000	1350	375188.122	441690.691	2.212
35	0.063	5.00	96.591	1500	375192.602	441699.519	2.202
36	0.000		95.670	1350	375163.952	441724.684	2.515
37	0.000		94.500	1350	375127.586	441766.871	1.976
38	0.000		94.500	20	375125.122	441764.580	3.295
19	0.000	5.00	94.465	20	375107.283	441765.386	3.310
20	0.000	5.00	94.477	2700	375102.874	441770.480	3.339
21	0.000		94.368	20	375101.997	441774.369	3.387
22	0.000	5.00	93.660	20	375107.327	441784.675	2.722
43			93.290	1350	375113.991	441784.437	2.379
46	0.000		92.782	2100	375119.208	441787.571	1.904
47			90.000	1200	375111.350	441826.197	0.999

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	Design Flow (l/s)
1.000	1	2	19.668	0.600	96.582	96.385	0.197	100.0	300	5.21	50.0	
1.001	2	3	33.756	0.600	96.385	96.047	0.338	100.0	300	5.57	50.0	
1.002	3	4	37.057	0.600	96.047	94.269	1.778	20.8	300	5.75	49.8	
1.003	4	5	13.872	0.600	94.194	93.847	0.347	40.0	375	5.83	49.5	
1.004	5	6	15.910	0.600	93.847	93.581	0.266	59.8	375	5.94	49.2	
1.005	6	7	13.128	0.600	92.735	92.702	0.033	400.0	1200	6.06	48.8	
1.006	7	8	9.960	0.600	92.702	92.677	0.025	398.4	1200	6.14	48.5	
1.007	8	9	10.058	0.600	92.677	92.652	0.025	402.3	1200	6.23	48.3	
1.008	9	10	9.083	0.600	92.652	92.629	0.023	400.0	1200	6.32	48.0	
1.009	10	11	29.689	0.600	92.629	92.555	0.074	400.0	1200	6.58	47.3	
1.010	11	12	9.793	0.600	92.555	92.531	0.024	400.0	1200	6.67	47.0	
1.011	12	13	7.427	0.600	92.524	92.505	0.019	400.0	1200	6.74	0.0	
1.012	13	14	38.057	0.600	92.505	92.387	0.118	322.5	375	7.37	0.0	50.0
2.000	24	25	37.663	0.600	95.282	94.772	0.510	73.8	300	5.34	50.0	
2.001	25	14	15.442	0.600	94.772	94.463	0.309	50.0	300	5.46	50.0	
1.013	14	15	34.995	0.600	92.383	92.266	0.117	300.0	375	7.93	43.8	
3.000	27	28	27.342	0.600	97.334	97.061	0.273	100.0	300	5.29	50.0	
3.001	28	29	15.637	0.600	97.061	96.905	0.156	100.0	300	5.46	50.0	
3.002	29	30	8.499	0.600	96.905	96.820	0.085	100.0	300	5.55	50.0	
3.003	30	31	14.842	0.600	96.820	96.226	0.594	25.0	300	5.62	50.0	
3.004	31	32	53.532	0.600	96.151	94.010	2.141	25.0	375	5.87	49.4	
3.005	32	15	11.338	0.600	94.010	93.443	0.567	20.0	375	5.92	49.3	
1.014	15	16	64.470	0.600	91.471	91.310	0.161	400.0	1200	8.50	0.0	
1.015	16	17	32.682	0.600	91.310	91.228	0.082	400.0	1200	8.80	41.9	

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	1.572	111.1	31.6	1.466	1.745	0.175	0.0
1.001	1.572	111.1	31.6	1.745	1.557	0.175	0.0
1.002	3.459	244.5	56.5	1.557	1.600	0.314	0.0
1.003	2.872	317.2	74.8	1.600	1.373	0.418	0.0
1.004	2.346	259.1	88.3	1.373	1.294	0.497	0.0
1.005	1.864	2108.2	87.7	1.315	1.118	0.497	0.0
1.006	1.868	2112.4	89.8	1.118	1.657	0.512	0.0
1.007	1.859	2102.1	97.7	1.657	1.902	0.560	0.0
1.008	1.864	2108.2	97.2	1.902	1.940	0.560	0.0
1.009	1.864	2108.2	95.6	1.940	2.052	0.560	0.0
1.010	1.864	2108.2	95.1	2.052	1.986	0.560	0.0
1.011	1.864	2108.2	0.0	1.993	2.042	0.663	0.0
1.012	1.003	110.8	50.0	2.867	3.479	0.663	0.0
2.000	1.831	129.4	31.4	2.070	1.575	0.174	0.0
2.001	2.228	157.5	54.8	1.575	1.478	0.303	0.0
1.013	1.041	114.9	164.4	3.483	3.764	1.039	0.0
3.000	1.572	111.1	23.9	1.800	1.630	0.132	0.0
3.001	1.572	111.1	43.5	1.630	1.586	0.241	0.0
3.002	1.572	111.1	58.0	1.586	1.399	0.321	0.0
3.003	3.157	223.1	58.0	1.399	1.625	0.321	0.0
3.004	3.636	401.6	85.7	1.625	2.031	0.480	0.0
3.005	4.067	449.2	110.5	2.031	2.587	0.621	0.0
1.014	1.864	2108.2	0.0	3.734	2.829	1.737	0.0
1.015	1.864	2108.2	281.0	2.829	2.989	1.857	0.0

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	Design Flow (l/s)
1.016	17	18	9.191	0.600	91.228	91.205	0.023	400.0	1200	8.88	41.7	
4.000	34	35	23.441	0.600	95.632	94.466	1.166	20.1	300	5.11	50.0	
5.000	40	41	10.895	0.600	94.897	94.788	0.109	100.0	300	5.12	50.0	
5.001	41	35	9.900	0.600	94.788	94.464	0.324	30.6	300	5.17	50.0	
4.001	35	36	38.133	0.600	94.389	93.155	1.234	30.9	375	5.37	50.0	
4.002	36	37	55.698	0.600	93.156	92.524	0.632	88.1	375	5.85	49.5	
4.003	37	38	3.365	0.600	92.524	92.400	0.124	27.1	375	5.86	49.4	
1.018	19	20	6.737	0.600	91.155	91.138	0.017	400.0	1200	5.06	50.0	
1.019	20	21	3.987	0.600	91.138	91.121	0.017	234.5	300	5.13	50.0	
6.000	22	43	6.668	0.600	90.938	90.911	0.027	245.0	300	5.11	50.0	
7.001	43	46	6.086	0.600	90.911	90.878	0.033	184.4	300	5.20	50.0	
6.004	46	47	39.417	0.600	90.878	89.001	1.877	21.0	300	5.39	50.0	

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.016	1.864	2108.2	288.7	2.989	2.956	1.916	0.0
4.000	3.522	249.0	28.6	1.584	1.825	0.158	0.0
5.000	1.572	111.1	19.7	1.953	1.912	0.109	0.0
5.001	2.852	201.6	38.1	1.912	1.827	0.211	0.0
4.001	3.269	361.1	78.1	1.827	2.140	0.432	0.0
4.002	1.931	213.3	77.2	2.139	1.601	0.432	0.0
4.003	3.492	385.7	77.2	1.601	1.725	0.432	0.0
1.018	1.864	2108.2	0.0	2.110	2.139	0.000	0.0
1.019	1.022	72.3	0.0	3.039	2.947	0.000	0.0
6.000	1.000	70.7	0.0	2.422	2.079	0.000	0.0
7.001	1.154	81.6	0.0	2.079	1.604	0.000	0.0
6.004	3.446	243.5	0.0	1.604	0.699	0.000	0.0

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m ³ /ha)	0.0
M5-60 (mm)	19.000	Starting Level (m)	
Ratio-R	0.250	Check Discharge Rate(s)	x
Summer CV	1.000	Check Discharge Volume	✓
Winter CV	1.000	100 year 360 minute (m ³)	
Analysis Speed	Detailed		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
30	40	10	0

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	2.452	Storm Duration (mins)	360
Soil Index	4	Betterment (%)	0
SPR	0.47	PR	
CWI		Runoff Volume (m ³)	

Node 46 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	90.878	Product Number	CTL-SHE-0247-3500-1500-3500
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	35.0	Min Node Diameter (mm)	2100

Node 13 Online Hydro-Brake® Control

Flap Valve	x	Objective	(CL) Minimise blockage risk
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	92.505	Product Number	CTL-SCL-0262-5000-2000-5000
Design Depth (m)	2.000	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	50.0	Min Node Diameter (mm)	2100

Node 20 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	91.138	Product Number	CTL-SHE-0233-3800-3000-3800
Design Depth (m)	3.000	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	38.0	Min Node Diameter (mm)	2700

Node 22 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	17.210
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	90.938	Main Channel Slope (1:X)	400.0
Safety Factor	2.0	Time to half empty (mins)	0	Main Channel n	0.030

Inlets

21

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	165.0	0.0	1.400	336.0	0.0

Node 19 Tank Storage Structure

Invert Level (m)	91.155	Analyse flow through structure	✓	Main Channel Slope (1:X)	400.0
Time to half empty (mins)	450	Main Channel Length (m)	20.000	Main Channel n	0.015

Inlets

18 | 38

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1200.0	1.600	1200.0

Results for 30 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	1	10	96.824	0.242	95.6	0.3470	0.0000	OK
15 minute summer	2	10	96.613	0.228	94.9	0.3258	0.0000	OK
15 minute summer	3	10	96.232	0.185	169.6	0.2650	0.0000	OK
120 minute summer	4	82	94.682	0.488	123.9	0.8617	0.0000	SURCHARGED
120 minute summer	5	82	94.676	0.829	147.3	1.4655	0.0000	SURCHARGED
120 minute summer	6	82	94.668	1.933	147.3	8.7457	0.0000	SURCHARGED
120 minute summer	7	82	94.668	1.966	138.4	8.8951	0.0000	SURCHARGED
120 minute summer	8	82	94.668	1.991	133.1	9.0082	0.0000	SURCHARGED
120 minute summer	9	82	94.668	2.016	115.6	9.1212	0.0000	SURCHARGED
120 minute summer	10	82	94.668	2.039	98.8	9.2251	0.0000	SURCHARGED
120 minute summer	11	82	94.668	2.113	71.0	9.5598	0.0000	SURCHARGED
120 minute summer	12	82	94.668	2.144	74.2	9.6999	0.0000	SURCHARGED
120 minute summer	13	82	94.668	2.163	59.9	12.3856	0.0000	SURCHARGED
15 minute summer	24	11	95.486	0.204	95.0	0.2919	0.0000	OK
15 minute summer	25	11	95.206	0.434	161.9	0.6212	0.0000	SURCHARGED
30 minute summer	14	19	93.178	0.795	233.9	2.0233	0.0000	SURCHARGED
15 minute summer	27	11	97.859	0.525	72.1	0.9274	0.0000	SURCHARGED
15 minute summer	28	11	97.722	0.661	126.5	1.1686	0.0000	SURCHARGED
15 minute summer	29	11	97.426	0.521	168.9	0.9209	0.0000	SURCHARGED
15 minute summer	30	11	97.054	0.234	169.3	0.4140	0.0000	OK
15 minute summer	31	11	96.363	0.212	252.3	0.3752	0.0000	OK
15 minute summer	32	11	94.324	0.314	326.1	0.5542	0.0000	OK
960 minute summer	15	660	92.449	0.978	131.6	3.3861	0.0000	OK
960 minute summer	16	660	92.448	1.138	136.4	3.9437	0.0000	OK
960 minute summer	17	660	92.448	1.220	134.2	4.2277	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	1	1.000	2	94.9	1.603	0.854	1.1641	
15 minute summer	2	1.001	3	93.7	1.846	0.844	1.7387	
15 minute summer	3	1.002	4	170.8	3.300	0.698	2.1212	
120 minute summer	4	1.003	5	123.9	1.972	0.391	1.5300	
120 minute summer	5	1.004	6	147.3	2.248	0.568	1.7548	
120 minute summer	6	1.005	7	134.0	0.524	0.064	14.7914	
120 minute summer	7	1.006	8	118.9	0.497	0.056	11.2220	
120 minute summer	8	1.007	9	115.6	0.532	0.055	11.3324	
120 minute summer	9	1.008	10	98.8	0.558	0.047	10.2339	
120 minute summer	10	1.009	11	71.0	0.662	0.034	33.4509	
120 minute summer	11	1.010	12	47.0	0.381	0.022	11.0339	
120 minute summer	12	1.011	13	59.9	0.465	0.028	8.3681	
120 minute summer	13	1.012	14	50.0	0.963	0.451	4.1815	
15 minute summer	24	2.000	25	92.1	1.480	0.711	2.2867	
15 minute summer	25	2.001	14	160.5	2.281	1.019	1.0770	
30 minute summer	14	1.013	15	231.5	2.100	2.014	3.7717	
15 minute summer	27	3.000	28	69.7	1.072	0.627	1.9254	
15 minute summer	28	3.001	29	127.2	1.806	1.144	1.1011	
15 minute summer	29	3.002	30	169.3	2.463	1.524	0.5501	
15 minute summer	30	3.003	31	169.5	3.156	0.760	0.7942	
15 minute summer	31	3.004	32	252.7	3.061	0.629	4.3582	
15 minute summer	32	3.005	15	327.1	3.798	0.728	0.9670	
960 minute summer	15	1.014	16	127.0	0.616	0.060	67.3298	
960 minute summer	16	1.015	17	129.6	0.567	0.061	36.4747	
960 minute summer	17	1.016	18	131.1	1.460	0.062	10.3556	

Results for 30 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
960 minute summer	18	660	92.448	1.243	131.1	0.0000	0.0000	OK
15 minute summer	34	10	95.758	0.126	86.3	0.1421	0.0000	OK
15 minute summer	40	10	95.083	0.186	59.5	0.2661	0.0000	OK
15 minute summer	41	10	94.983	0.195	114.8	0.2789	0.0000	OK
15 minute summer	35	11	94.612	0.223	234.6	0.3939	0.0000	OK
15 minute summer	36	11	93.667	0.512	233.4	0.7326	0.0000	SURCHARGED
15 minute summer	37	11	92.776	0.251	223.7	0.3599	0.0000	OK
960 minute summer	38	660	92.438	1.233	33.7	0.0000	0.0000	OK
960 minute summer	19	660	92.430	1.275	98.8	1412.5130	0.0000	SURCHARGED
960 minute summer	20	660	92.430	1.292	38.8	7.3999	0.0000	SURCHARGED
1440 minute summer	21	1350	91.665	0.684	37.9	0.0000	0.0000	OK
1440 minute summer	22	1350	91.665	0.727	36.5	0.0000	0.0000	SURCHARGED
1440 minute summer	43	1350	91.655	0.744	35.1	1.0648	0.0000	SURCHARGED
1440 minute summer	46	1350	91.643	0.765	35.0	2.6501	0.0000	SURCHARGED
15 minute summer	47	1	90.000	0.999	29.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
960 minute summer	18	Tank	19	98.8	0.039	0.000		
15 minute summer	34	4.000	35	86.0	2.833	0.346	0.7178	
15 minute summer	40	5.000	41	59.2	1.255	0.532	0.5137	
15 minute summer	41	5.001	35	114.2	2.633	0.566	0.4288	
15 minute summer	35	4.001	36	233.4	2.560	0.647	3.4043	
15 minute summer	36	4.002	37	223.7	2.349	1.049	5.2596	
15 minute summer	37	4.003	38	222.7	3.202	0.577	0.2336	
960 minute summer	38	Tank	19	98.8	0.039	0.000		
960 minute summer	19	1.018	20	38.8	0.103	0.018	7.5906	
960 minute summer	20	1.019	21	37.9	1.024	0.525	0.2808	
1440 minute summer	21	Flow through Pond	22	36.5	0.015	0.000	146.8547	
1440 minute summer	22	6.000	43	35.1	0.498	0.496	0.4696	
1440 minute summer	43	7.001	46	35.0	0.498	0.430	0.4286	
1440 minute summer	46	6.004	47	35.0	0.689	0.144	1.6655	2519.0

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.000	Minimum Backdrop Height (m)	0.650
Ratio-R	0.250	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.175	5.00	98.348	1350	375152.585	441486.944	1.766
2	0.000		98.430	1350	375136.780	441498.650	2.045
3	0.139	5.00	97.904	1350	375104.162	441507.340	1.857
4	0.104	5.00	96.169	1500	375068.503	441517.424	1.975
5	0.079	5.00	95.595	1500	375057.846	441526.304	1.748
6	0.000		95.250	2400	375053.313	441541.555	2.515
7	0.015	5.00	95.020	2400	375052.034	441554.621	2.318
8	0.048	5.00	95.534	2400	375061.610	441557.360	2.857
9	0.000	5.00	95.754	2400	375068.966	441564.220	3.102
10	0.000	5.00	95.769	2400	375072.018	441572.775	3.140
11	0.000		95.807	2400	375073.925	441602.403	3.252
12	0.103	5.00	95.717	2400	375077.791	441611.401	3.193
13	0.000	5.00	95.747	2700	375083.542	441616.100	3.242
24	0.174	5.00	97.652	1350	375138.538	441578.532	2.370
25	0.129	5.00	96.647	1350	375126.652	441614.270	1.875
14	0.073	5.00	96.241	1800	375119.676	441628.046	3.858
27	0.132	5.00	99.434	1500	375243.470	441619.678	2.100
28	0.109	5.00	98.991	1500	375222.886	441601.681	1.930
29	0.080	5.00	98.791	1500	375212.291	441613.181	1.886
30	0.000		98.519	1500	375204.772	441617.142	1.699
31	0.159	5.00	98.151	1500	375190.039	441618.938	2.000
32	0.141	5.00	96.416	1500	375154.321	441658.811	2.406
15	0.077	5.00	96.405	2100	375145.843	441651.283	4.934
16	0.120	5.00	95.339	2100	375103.444	441699.849	4.029
17	0.059	5.00	95.417	2100	375082.262	441724.737	4.189
18	0.000		95.361	20	375088.993	441730.995	4.156
34	0.158	5.00	97.516	1200	375209.415	441683.185	1.884
40	0.109	5.00	97.150	1350	375180.394	441683.011	2.253
41	0.102	5.00	97.000	1350	375188.122	441690.691	2.212
35	0.063	5.00	96.591	1500	375192.602	441699.519	2.202
36	0.000		95.670	1350	375163.952	441724.684	2.515
37	0.000		94.500	1350	375127.586	441766.871	1.976
38	0.000		94.500	20	375125.122	441764.580	3.295
19	0.000	5.00	94.465	20	375107.283	441765.386	3.310
20	0.000	5.00	94.477	2700	375102.874	441770.480	3.339
21	0.000		94.368	20	375101.997	441774.369	3.387
22	0.000	5.00	93.660	20	375107.327	441784.675	2.722
43			93.290	1350	375113.991	441784.437	2.379
46	0.000		92.782	2100	375119.208	441787.571	1.904
47			90.000	1200	375111.350	441826.197	0.999

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	Design Flow (l/s)
1.000	1	2	19.668	0.600	96.582	96.385	0.197	100.0	300	5.21	50.0	
1.001	2	3	33.756	0.600	96.385	96.047	0.338	100.0	300	5.57	50.0	
1.002	3	4	37.057	0.600	96.047	94.269	1.778	20.8	300	5.75	49.8	
1.003	4	5	13.872	0.600	94.194	93.847	0.347	40.0	375	5.83	49.5	
1.004	5	6	15.910	0.600	93.847	93.581	0.266	59.8	375	5.94	49.2	
1.005	6	7	13.128	0.600	92.735	92.702	0.033	400.0	1200	6.06	48.8	
1.006	7	8	9.960	0.600	92.702	92.677	0.025	398.4	1200	6.14	48.5	
1.007	8	9	10.058	0.600	92.677	92.652	0.025	402.3	1200	6.23	48.3	
1.008	9	10	9.083	0.600	92.652	92.629	0.023	400.0	1200	6.32	48.0	
1.009	10	11	29.689	0.600	92.629	92.555	0.074	400.0	1200	6.58	47.3	
1.010	11	12	9.793	0.600	92.555	92.531	0.024	400.0	1200	6.67	47.0	
1.011	12	13	7.427	0.600	92.524	92.505	0.019	400.0	1200	6.74	0.0	
1.012	13	14	38.057	0.600	92.505	92.387	0.118	322.5	375	7.37	0.0	50.0
2.000	24	25	37.663	0.600	95.282	94.772	0.510	73.8	300	5.34	50.0	
2.001	25	14	15.442	0.600	94.772	94.463	0.309	50.0	300	5.46	50.0	
1.013	14	15	34.995	0.600	92.383	92.266	0.117	300.0	375	7.93	43.8	
3.000	27	28	27.342	0.600	97.334	97.061	0.273	100.0	300	5.29	50.0	
3.001	28	29	15.637	0.600	97.061	96.905	0.156	100.0	300	5.46	50.0	
3.002	29	30	8.499	0.600	96.905	96.820	0.085	100.0	300	5.55	50.0	
3.003	30	31	14.842	0.600	96.820	96.226	0.594	25.0	300	5.62	50.0	
3.004	31	32	53.532	0.600	96.151	94.010	2.141	25.0	375	5.87	49.4	
3.005	32	15	11.338	0.600	94.010	93.443	0.567	20.0	375	5.92	49.3	
1.014	15	16	64.470	0.600	91.471	91.310	0.161	400.0	1200	8.50	0.0	
1.015	16	17	32.682	0.600	91.310	91.228	0.082	400.0	1200	8.80	41.9	

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	1.572	111.1	31.6	1.466	1.745	0.175	0.0
1.001	1.572	111.1	31.6	1.745	1.557	0.175	0.0
1.002	3.459	244.5	56.5	1.557	1.600	0.314	0.0
1.003	2.872	317.2	74.8	1.600	1.373	0.418	0.0
1.004	2.346	259.1	88.3	1.373	1.294	0.497	0.0
1.005	1.864	2108.2	87.7	1.315	1.118	0.497	0.0
1.006	1.868	2112.4	89.8	1.118	1.657	0.512	0.0
1.007	1.859	2102.1	97.7	1.657	1.902	0.560	0.0
1.008	1.864	2108.2	97.2	1.902	1.940	0.560	0.0
1.009	1.864	2108.2	95.6	1.940	2.052	0.560	0.0
1.010	1.864	2108.2	95.1	2.052	1.986	0.560	0.0
1.011	1.864	2108.2	0.0	1.993	2.042	0.663	0.0
1.012	1.003	110.8	50.0	2.867	3.479	0.663	0.0
2.000	1.831	129.4	31.4	2.070	1.575	0.174	0.0
2.001	2.228	157.5	54.8	1.575	1.478	0.303	0.0
1.013	1.041	114.9	164.4	3.483	3.764	1.039	0.0
3.000	1.572	111.1	23.9	1.800	1.630	0.132	0.0
3.001	1.572	111.1	43.5	1.630	1.586	0.241	0.0
3.002	1.572	111.1	58.0	1.586	1.399	0.321	0.0
3.003	3.157	223.1	58.0	1.399	1.625	0.321	0.0
3.004	3.636	401.6	85.7	1.625	2.031	0.480	0.0
3.005	4.067	449.2	110.5	2.031	2.587	0.621	0.0
1.014	1.864	2108.2	0.0	3.734	2.829	1.737	0.0
1.015	1.864	2108.2	281.0	2.829	2.989	1.857	0.0

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	Design Flow (l/s)
1.016	17	18	9.191	0.600	91.228	91.205	0.023	400.0	1200	8.88	41.7	
4.000	34	35	23.441	0.600	95.632	94.466	1.166	20.1	300	5.11	50.0	
5.000	40	41	10.895	0.600	94.897	94.788	0.109	100.0	300	5.12	50.0	
5.001	41	35	9.900	0.600	94.788	94.464	0.324	30.6	300	5.17	50.0	
4.001	35	36	38.133	0.600	94.389	93.155	1.234	30.9	375	5.37	50.0	
4.002	36	37	55.698	0.600	93.156	92.524	0.632	88.1	375	5.85	49.5	
4.003	37	38	3.365	0.600	92.524	92.400	0.124	27.1	375	5.86	49.4	
1.018	19	20	6.737	0.600	91.155	91.138	0.017	400.0	1200	5.06	50.0	
1.019	20	21	3.987	0.600	91.138	91.121	0.017	234.5	300	5.13	50.0	
6.000	22	43	6.668	0.600	90.938	90.911	0.027	245.0	300	5.11	50.0	
7.001	43	46	6.086	0.600	90.911	90.878	0.033	184.4	300	5.20	50.0	
6.004	46	47	39.417	0.600	90.878	89.001	1.877	21.0	300	5.39	50.0	

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.016	1.864	2108.2	288.7	2.989	2.956	1.916	0.0
4.000	3.522	249.0	28.6	1.584	1.825	0.158	0.0
5.000	1.572	111.1	19.7	1.953	1.912	0.109	0.0
5.001	2.852	201.6	38.1	1.912	1.827	0.211	0.0
4.001	3.269	361.1	78.1	1.827	2.140	0.432	0.0
4.002	1.931	213.3	77.2	2.139	1.601	0.432	0.0
4.003	3.492	385.7	77.2	1.601	1.725	0.432	0.0
1.018	1.864	2108.2	0.0	2.110	2.139	0.000	0.0
1.019	1.022	72.3	0.0	3.039	2.947	0.000	0.0
6.000	1.000	70.7	0.0	2.422	2.079	0.000	0.0
7.001	1.154	81.6	0.0	2.079	1.604	0.000	0.0
6.004	3.446	243.5	0.0	1.604	0.699	0.000	0.0

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m ³ /ha)	0.0
M5-60 (mm)	19.000	Starting Level (m)	
Ratio-R	0.250	Check Discharge Rate(s)	x
Summer CV	1.000	Check Discharge Volume	✓
Winter CV	1.000	100 year 360 minute (m ³)	
Analysis Speed	Detailed		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	40	10	0

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	2.452	Storm Duration (mins)	360
Soil Index	4	Betterment (%)	0
SPR	0.47	PR	
CWI		Runoff Volume (m ³)	

Node 46 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	90.878	Product Number	CTL-SHE-0247-3500-1500-3500
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	35.0	Min Node Diameter (mm)	2100

Node 13 Online Hydro-Brake® Control

Flap Valve	x	Objective	(CL) Minimise blockage risk
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	92.505	Product Number	CTL-SCL-0262-5000-2000-5000
Design Depth (m)	2.000	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	50.0	Min Node Diameter (mm)	2100

Node 20 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	91.138	Product Number	CTL-SHE-0233-3800-3000-3800
Design Depth (m)	3.000	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	38.0	Min Node Diameter (mm)	2700

Node 22 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	17.210
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	90.938	Main Channel Slope (1:X)	400.0
Safety Factor	2.0	Time to half empty (mins)	0	Main Channel n	0.030

Inlets

21

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	165.0	0.0	1.400	336.0	0.0

Node 19 Tank Storage Structure

Invert Level (m)	91.155	Analyse flow through structure	✓	Main Channel Slope (1:X)	400.0
Time to half empty (mins)	144	Main Channel Length (m)	20.000	Main Channel n	0.015

Inlets

18 | 38

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1200.0	1.600	1200.0

Node 12 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	93.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	56

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	180.0	180.0	0.800	180.0	218.0	0.801	0.0	218.0

Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 69.10%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	1	11	97.216	0.634	123.1	0.9077	0.0000	SURCHARGED
15 minute summer	2	11	96.930	0.545	119.0	0.7799	0.0000	SURCHARGED
15 minute summer	3	11	96.505	0.458	213.2	0.6548	0.0000	SURCHARGED
15 minute summer	4	10	95.019	0.825	279.8	1.4576	0.0000	SURCHARGED
30 minute summer	5	18	94.596	0.749	326.7	1.3240	0.0000	SURCHARGED
120 minute summer	6	92	93.997	1.262	193.6	5.7078	0.0000	SURCHARGED
120 minute summer	7	92	93.997	1.295	190.1	5.8573	0.0000	SURCHARGED
120 minute summer	8	92	93.997	1.320	194.4	5.9705	0.0000	SURCHARGED
120 minute summer	9	92	93.997	1.345	181.4	6.0835	0.0000	SURCHARGED
120 minute summer	10	92	93.997	1.368	169.4	6.1872	0.0000	SURCHARGED
120 minute summer	11	92	93.996	1.441	151.5	6.5199	0.0000	SURCHARGED
120 minute summer	12	90	93.996	1.472	178.7	132.0849	0.0000	SURCHARGED
120 minute summer	13	90	93.996	1.491	60.2	8.5390	0.0000	SURCHARGED
15 minute summer	24	10	96.042	0.760	122.4	1.0877	0.0000	SURCHARGED
15 minute summer	25	10	95.516	0.744	209.1	1.0645	0.0000	SURCHARGED
30 minute summer	14	18	93.348	0.965	262.4	2.4563	0.0000	SURCHARGED
15 minute summer	27	11	98.488	1.154	92.8	2.0396	0.0000	SURCHARGED
15 minute summer	28	11	98.275	1.214	162.7	2.1444	0.0000	SURCHARGED
15 minute summer	29	11	97.814	0.909	212.0	1.6061	0.0000	SURCHARGED
15 minute summer	30	11	97.267	0.447	210.5	0.7906	0.0000	SURCHARGED
15 minute summer	31	11	96.408	0.257	315.2	0.4549	0.0000	OK
15 minute summer	32	11	94.614	0.604	409.3	1.0671	0.0000	SURCHARGED
600 minute summer	15	420	92.822	1.351	189.3	4.6787	0.0000	SURCHARGED
480 minute summer	16	384	92.861	1.551	228.6	5.3720	0.0000	SURCHARGED
600 minute summer	17	420	92.821	1.593	195.0	5.5188	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	1	1.000	2	119.0	1.690	1.071	1.3850	
15 minute summer	2	1.001	3	115.8	1.906	1.042	2.3771	
15 minute summer	3	1.002	4	206.7	3.264	0.846	2.6095	
15 minute summer	4	1.003	5	273.5	2.480	0.862	1.5300	
30 minute summer	5	1.004	6	329.7	2.990	1.272	1.7371	
120 minute summer	6	1.005	7	184.3	0.542	0.087	14.7914	
120 minute summer	7	1.006	8	175.7	0.525	0.083	11.2220	
120 minute summer	8	1.007	9	181.4	0.576	0.086	11.3324	
120 minute summer	9	1.008	10	169.4	0.673	0.080	10.2339	
120 minute summer	10	1.009	11	151.5	0.650	0.072	33.4509	
120 minute summer	11	1.010	12	138.6	0.354	0.066	11.0339	
120 minute summer	12	1.011	13	60.2	0.495	0.029	8.3681	
120 minute summer	13	1.012	14	50.0	0.963	0.451	4.1976	
15 minute summer	24	2.000	25	119.1	1.691	0.920	2.6522	
15 minute summer	25	2.001	14	207.0	2.940	1.314	1.0764	
30 minute summer	14	1.013	15	261.3	2.369	2.273	3.8074	
15 minute summer	27	3.000	28	86.9	1.234	0.782	1.9254	
15 minute summer	28	3.001	29	158.3	2.248	1.425	1.1011	
15 minute summer	29	3.002	30	210.5	2.990	1.895	0.5985	
15 minute summer	30	3.003	31	208.5	3.254	0.934	0.9459	
15 minute summer	31	3.004	32	314.7	3.039	0.784	5.1111	
15 minute summer	32	3.005	15	407.1	3.861	0.906	1.1142	
600 minute summer	15	1.014	16	181.9	0.706	0.086	72.6389	
480 minute summer	16	1.015	17	215.8	0.695	0.102	36.8231	
600 minute summer	17	1.016	18	190.6	1.646	0.090	10.3556	

Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 69.10%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
600 minute summer	18	420	92.821	1.616	190.6	0.0000	0.0000	OK
15 minute summer	34	11	95.773	0.141	111.1	0.1596	0.0000	OK
15 minute summer	40	11	95.353	0.456	76.7	0.6523	0.0000	SURCHARGED
15 minute summer	41	11	95.280	0.492	147.4	0.7037	0.0000	SURCHARGED
15 minute summer	35	11	95.028	0.639	290.4	1.1284	0.0000	SURCHARGED
30 minute summer	36	19	94.104	0.949	282.2	1.3586	0.0000	SURCHARGED
15 minute summer	37	12	92.818	0.294	275.9	0.4214	0.0000	OK
360 minute winter	38	328	92.802	1.597	278.0	0.0000	0.0000	OK
360 minute winter	19	328	92.793	1.638	3166.5	1801.4010	0.0000	SURCHARGED
480 minute summer	20	384	92.797	1.659	199.9	9.5006	0.0000	SURCHARGED
1440 minute winter	21	1560	91.912	0.931	37.9	0.0000	0.0000	OK
1440 minute winter	22	1560	91.912	0.974	36.4	0.0000	0.0000	SURCHARGED
1440 minute winter	43	1560	91.904	0.993	35.1	1.4205	0.0000	SURCHARGED
1440 minute winter	46	1560	91.893	1.015	35.0	3.5174	0.0000	SURCHARGED
15 minute summer	47	1	90.000	0.999	32.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
600 minute summer	18	Tank	19	-1344.3	0.036	-0.005		
15 minute summer	34	4.000	35	110.8	2.792	0.445	1.2070	
15 minute summer	40	5.000	41	75.7	1.281	0.682	0.7672	
15 minute summer	41	5.001	35	137.5	2.592	0.682	0.6972	
15 minute summer	35	4.001	36	279.9	2.634	0.775	4.2060	
30 minute summer	36	4.002	37	276.1	2.563	1.294	5.6514	
15 minute summer	37	4.003	38	276.9	3.355	0.718	0.2762	
360 minute winter	38	Tank	19	-21320.9	-0.414	-0.079		
360 minute winter	19	1.018	20	-661.5	-0.636	-0.314	7.5906	
480 minute summer	20	1.019	21	37.9	1.027	0.525	0.2808	
1440 minute winter	21	Flow through Pond	22	36.4	0.019	0.000	212.6868	
1440 minute winter	22	6.000	43	35.1	0.498	0.496	0.4696	
1440 minute winter	43	7.001	46	35.0	0.498	0.429	0.4286	
1440 minute winter	46	6.004	47	35.0	0.689	0.144	1.6655	2628.6

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.250	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
3	0.027	5.00	93.850	1500	375045.847	441556.864	2.659
2	0.000		92.750	1500	375016.566	441561.743	1.680
1			92.570	1200	375012.521	441564.720	1.850

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
100.000	3	2	29.685	0.600	91.191	91.070	0.121	245.0	450	5.38	50.0
100.001	2	1	5.022	0.600	91.070	90.720	0.350	14.3	225	5.41	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
100.000	1.294	205.8	3.7	2.209	1.230	0.027	0.0	41	0.501
100.001	3.472	138.0	3.7	1.455	1.625	0.027	0.0	25	1.511

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m ³ /ha)	0.0
M5-60 (mm)	19.000	Starting Level (m)	
Ratio-R	0.250	Check Discharge Rate(s)	✓
Summer CV	1.000	Check Discharge Volume	✓
Winter CV	1.000	100 year 360 minute (m ³)	
Analysis Speed	Detailed		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
30	40	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m ³)	

Node 2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	91.070	Product Number	CTL-SHE-0075-2500-1000-2500
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.5	Min Node Diameter (mm)	1200

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
60 minute summer	3	44	91.507	0.316	10.4	0.5587	0.0000	OK
60 minute summer	2	43	91.508	0.438	7.7	0.7748	0.0000	SURCHARGED
15 minute winter	1	15	90.741	0.021	2.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
60 minute summer	3	100.000	2	7.7	0.381	0.038	4.0868	
60 minute summer	2	100.001	1	2.5	1.306	0.018	0.0096	11.0

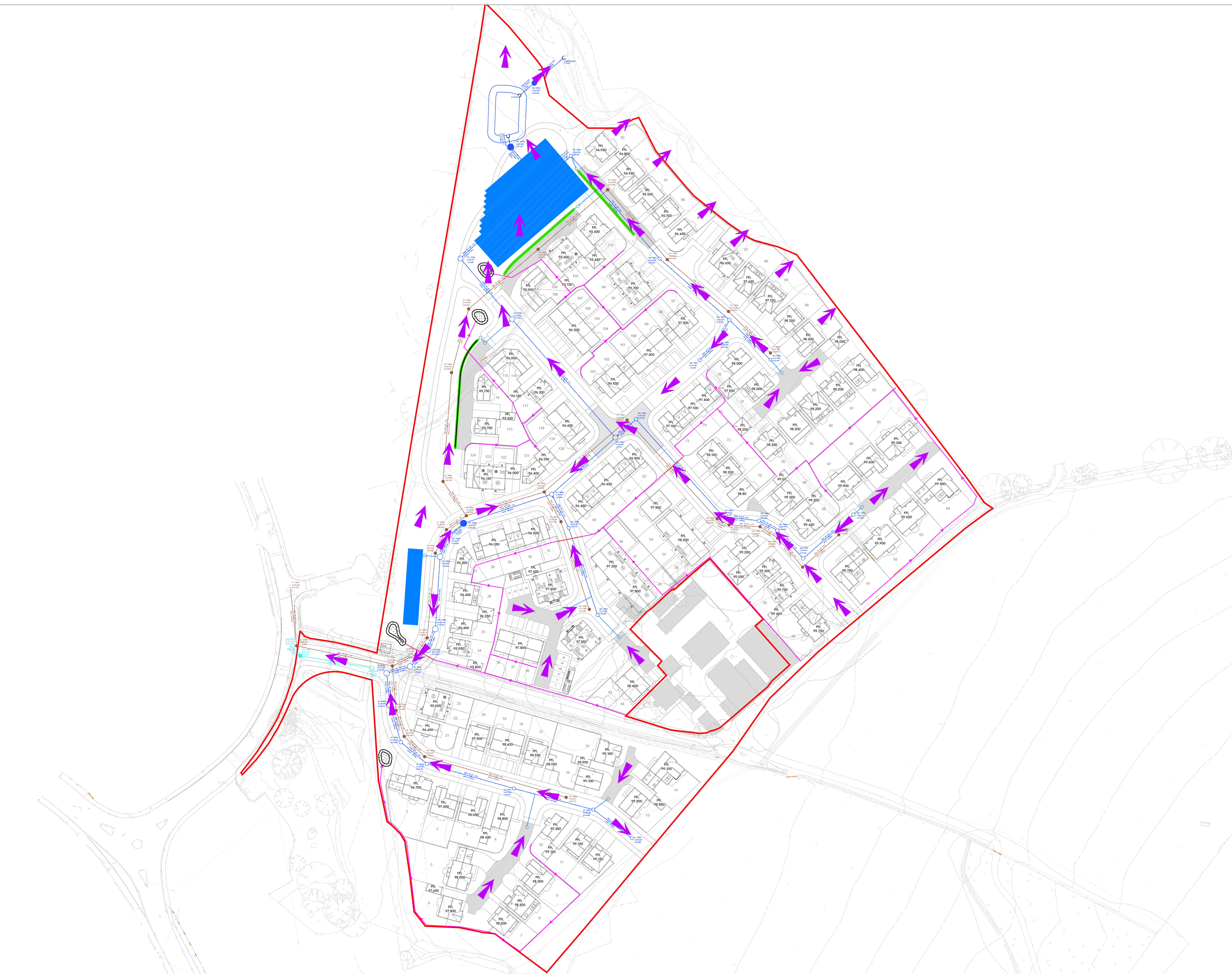
Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
120 minute summer	3	82	92.126	0.935	9.6	1.6525	0.0000	SURCHARGED
120 minute summer	2	82	92.127	1.057	7.1	1.8682	0.0000	SURCHARGED
120 minute summer	1	82	90.741	0.021	2.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
120 minute summer	3	100.000	2	7.1	0.373	0.034	4.7034	
120 minute summer	2	100.001	1	2.5	1.312	0.018	0.0097	19.1



25.0 APPENDIX L – FLOOD EXCEEDANCE PLAN



- NOTES:**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
 - ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.
 - ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.
 - LOCATION AND LEVELS OF EXISTING PUBLIC SEWERS BASED ON WATER AUTHORITY SEWER RECORDS. SEWERS TO BE FULLY SURVEYED, ALL LOCATIONS TO BE CONFIRMED.
 - SETTING OUT SHALL BE UNDERTAKEN USING ONLY THE INFORMATION GIVEN.
 - ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION GUIDANCE AND WHERE APPLICABLE UNITED UTILITIES DETAILS
 - THE MINIMUM GRAVITY PIPE DIAMETER UNDER ADOPTABLE HIGHWAYS SHALL BE 150mm
 - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL INFORMATION GIVEN WITH REGARDS TO EXISTING SERVICES AND DRAINAGE CONNECTIONS ETC. PRIOR TO COMMENCING THE WORKS. THE CONTRACTOR SHALL ADHERE TO THE CDM REGULATIONS AT ALL TIMES
 - EXISTING FLOWS IN WATERCOURSES, SEWERS AND LAND DRAINS SHALL BE MAINTAINED AT ALL TIMES
 - ALL MATERIALS TO BEAR THE RELEVANT B.S. KITEMARK AND COMPLY FULLY WITH THE SPECIFICATIONS. ALL CONCRETE & CONCRETE PRODUCTS MUST USE SULPHATE RESISTANT CEMENT (UNLESS THE SITE INVESTIGATION REPORT PROVES THAT SULPHATE ATTACK FROM SOILS AND GROUNDWATER WILL NOT OCCUR TO WITHSTAND A CLASS
 - ALL OPENING NOTICES ETC. AS REQUIRED UNDER HIGHWAYS ACTS ETC. ARE TO BE OBTAINED PRIOR TO COMMENCEMENT OF WORKS. ALL WORKS ARE TO BE INSPECTED BY L.A., NHBC OR THE NETWORK OPERATOR AS APPLICABLE.
 - WHERE "ULTRA RIB" UPVC PIPES (OR SIMILAR APPROVED) ARE USED IN ADOPTABLE DRAINAGE THEY SHALL STILL BE HANDLED AND LAID IN ACCORDANCE WITH THE SPECIFICATION AND GUIDANCE ISSUED BY THE HIGH PERFORMANCE PIPE ASSOCIATION.
 - A CLASS 5 BED AND SURROUND MUST BE USED FOR SUCH PIPES. TRENCH BACKFILL IN HIGHWAYS TO WITHIN 1m OF HIGHWAY SHALL, AS DIRECTED BY THE HIGHWAY AUTHORITY BE A SUITABLE GRANULAR MATERIAL. ALL IN ACCORDANCE WITH SEWERS FOR ADOPTION CL. 4.3.4.
 - DOMESTIC DRAINAGE SHALL BE TO BUILDING REGULATIONS APPROVED DOCUMENT H. 100mm U.P.V.C. PIPES LAID TO THE FOLLOWING MINIMUM FALLS UNLESS OTHERWISE SHOWN.

FOUL	S.W.
HEAD RUN	1 IN 40
ELSEWHERE	1 IN 80
	1 IN 100
 - ALL LATERAL CONNECTIONS FROM THE PRIVATE NETWORK TO BE 150mm U.P.V.C PIPES UNLESS STATED OTHERWISE
 - ALL GULLY CONNECTIONS TO BE 150mm VITRIFIED CLAY UNLESS NOTED OTHERWISE
 - MINIMUM COVER TO DRAINAGE SOFFIT LEVEL:

LANDSCAPING	TRAFFICKED AREAS	HIGHWAYS
0.600m	0.900m	1.200m
 - CLASS 'S' BEDDING AND SURROUND TO BE USED WHERE MINIMUM COVER IS ACHIEVED.
 - WHERE MINIMUM COVER IS NOT ACHIEVED CLASS 'Z' BEDDING AND SURROUND (CONCRETE ENCASUREMENT) IS TO BE USED.
 - ANY DAMAGE TO THE EXISTING SEWER NETWORK BECAUSE OF THE DEVELOPMENT SITES ACTIVITIES WILL NEED TO BE RECTIFIED AT THE DEVELOPERS EXPENSE.

OVERLAND FLOOD EXCEEDANCE ROUTE
 ADOPTABLE SURFACE WATER SEWER

IN THE UNLIKELY EVENT OF BLOCKAGES/FAILURE OVERLAND FLOW ROUTES WILL BE CONTAINED WITHIN KERBS AND RE-ENTER THE SYSTEM VIA GULLIES.

IN PRIVATE AREAS, SUCH AS DRIVEWAYS, RUN-OFF WILL BE CAPTURED BY ACO DRAINS TO ENSURE THERE IS NO RISK TO PROPERTIES.

ALL PROPERTIES FFL'S ARE SET 150mm ABOVE ADJACENT GROUND LEVELS AND ABOVE THOSE OF THE CONNECTING ADOPTABLE MANHOLES.

P04	31.03.2026	KF	UPDATED DRAINAGE STRATEGY
P03	26.02.2026	KF	UPDATED DRAINAGE STRATEGY
P02	23.07.2025	PB	UPDATED DRAINAGE STRATEGY
P01	16.01.2025	PB	FIRST ISSUE
Rev	Date	By	Description

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Client: MORRIS HOMES
 Project: HIGHMOOR FARM, CLITHEROE
 Title: FLOOD EXCEEDANCE PLAN

Status	Subsidiary Description	Structural Stage	Date
	PLANNING		16.01.2026

Designed By	Drawn By	Scale @ A0	Project No.
PB	PB	1:500	2936

Sheet No. 2936-SCE-00.00.DR.C-0020
 Revision: P04