

Document ref: YYDE-HYD-XX-XX-RP-G-00004

Conna Ryan
AECOM
1 Callaghan Square
Cardiff
CF10 5BT

11 August 2021

RE: Additional topsoil testing at Ysgol Y Deri 2

Dear Conna

Project Background

Hydrock undertook a Phase 1 Ground Conditions Desk Study which was issued on 20th November 2020 (ref; YYDE-HYD-XX-XX-RP-G-00002). The Phase 1 Ground Conditions Desk Study should be read in conjunction with this report.

In April 2021, Hydrock Consultants Limited (Hydrock) was commissioned by AECOM (the Client) to undertake a Phase 2 ground investigation (Report Ref YYD-HYD-XX-XX-RP-GE-0003 issued 18th June 2021) at the site off Lavernock Road, Cosmeston. The nearest postcode is CF64 5UP with the National Grid Reference for the site 317859E, 168833N. A site location plan (Hydrock drawing 17379-HYD-XX-XX-DR-GE-1000) is attached to this letter along with a proposed development layout (HLM Architects drawing YD2-HLM-00-00-DR-L-0004).

Following the environmental assessment in the Phase 2 report (Ref YYD-HYD-XX-XX-RP-GE-0003 18th June 2021) there was concern relating to topsoil contamination (specifically Polyaromatic Hydrocarbons (PAHs)) in two areas of the site that Hydrock recommended required further consideration in terms of risk to human health/end user of the site. Additional work was recommended in order to better define the extent of contamination and its potential impact on the proposed development/end users.

In June 2021 Hydrock were instructed by AECOM (email from Conna Ryan 17th June 2021) to undertake a day of hand pitting and topsoil sampling/testing in order to better assess the topsoil contamination that was identified during Hydrock's Phase 2 Ground investigation.

The majority of the contamination was centred around TP01 with exceedances of the relevant generic assessment criteria (GAC) by six different Poly Aromatic Hydrocarbon (PAH) compounds. There was also a very minor exceedance of benzo(a)pyrene in SA03. The exceedances recorded are noted in Table 1 and the locations of the exploratory holes referenced are noted on the exploratory hole location plan (Hydrock drawing 17379-HYD-XX-XX-DR-GE-1004), which has been updated to include these most recent hand pit locations and is attached to this report.

Due to the small size of the data set (6 samples) statistical analysis was not considered appropriate during the first ground investigation that Hydrock undertook and therefore only direct comparison of testing data with the relevant GAC was undertaken.

Table 1: Exceedances of relevant thresholds prior to additional sampling (Residential without consumption of produce)

Chemical of potential concern	Generic criterion (mg/kg)	Basis for generic criterion	No. samples	Min. (mg/kg)	Max. (mg/kg)	No. samples exceeding generic criterion
<i>Topsoil</i>						
Benzo(a)anthracene	9.4	GAC	6	0.05	25	1
Benzo(a)pyrene	1.6	GAC	6	0.05	18	2
Benzo(b)fluoranthene	11	GAC	6	0.05	28	1
Chrysene	15	GAC	6	0.05	24	1
Dibenz(a,h)anthracene	1.4	GAC	6	0.05	3.5	1
Indeo(1,2,3,cd)pyrene	6.7	GAC	6	0.05	10	1
<i>Natural Soil (excluding topsoil)</i>						
No Exceedances						

Following the assessment, it was proposed to undertake additional topsoil sampling in the vicinity of TP01 and SA03 and some additional across the wider site for the following reasons;

1. To obtain more data around the areas of known topsoil contamination and to assess the extent of these areas of contamination.
2. To obtain more topsoil chemical test data from the wider site and allow statistical analysis to be undertaken.

Scope of Work

A Hydrock engineer attended site on 21st June 2021 to undertake 11 hand excavated trial pits to the top of the natural weathered bedrock or to a depth of around 0.5m (whichever was the shallower). The pits were logged in accordance with BS5930 and environmental sampling undertaken. The hand pit logs and photographs of the arisings are attached to this report.

The samples were dispatched to an MCERTS accredited laboratory and tested for a PAH suite. It was not considered necessary to test for a full suite of contaminants as the only exceedances noted during the initial investigation were of PAH.

The positions of these hand pits were recorded using a total station GPS unit and the locations are shown on the exploratory hole location plan (Hydrock drawing 17379-HYD-XX-XX-DR-GE-1004) attached to this report.

Ground Conditions Encountered

In all of the pits, apart from HP03, topsoil was encountered from ground level to depths of between 0.25m and 0.35m below ground level (bgl) with pits terminating at the base of the topsoil. Topsoil was generally described as firm brown slightly gravelly silty CLAY with rootlets which is consistent with the topsoil described during the initial investigation.

In HP03 Made Ground was encountered from ground level to a depth of 0.2m bgl and described as a soft to firm dark brown gravelly sandy CLAY with rootlets. Reworked natural clay was encountered from the base of the Made Ground to the base of the pit at 0.45m bgl. It was described as a firm dark brown and red mottled silty CLAY with occasional rootlets.

The ground conditions encountered are consistent with those described in the initial report. The presence of a small amount of Made / reworked ground in HP03 is consistent with the findings of the previous investigation which encountered contamination in this area suggesting that the ground had been reworked by agricultural activities in the past.

Environmental Assessment

The results of the PAH testing have been added to the existing topsoil testing data and a screening sheet including the full set of results is attached to this letter report. Although Made Ground was encountered in HP03 this was organic rich and has been included together with the topsoil. The screening sheet also includes a US95 value for the purposes of statistical assessment.

Leaving aside the statistical analysis and making a direct comparison of the test results with the threshold values it is noted that in addition to the exceedances noted during the original investigation there was also a value of benzo(a)pyrene (BaP) in the Made Ground in HP03 equal to the GAC of 1.6 mg/kg.

The US95 values produced by the statistical assessment for PAH compounds, shows that only BaP is above the GAC, with a US95 of 5.7 mg/kg compared to a GAC of 1.6 mg/kg.

It is therefore considered that the contamination encountered in TP01 is an isolated incidence and has been sufficiently delineated by the surrounding hand pits (i.e. contamination is limited to TP01). TP01 remains a statistically outlier that requires mitigation during the development of the site.

Recommendations

In the currently proposed configuration of the development the area surrounding TP01 is expected to be below the building footprint. However, topsoil from this area will need to be stripped from beneath any building footprint/hardstanding and will not be suitable for re-use on the school site.

It is recommended that topsoil stripped from within a 10m radius of the location of TP01 be stockpiled separately and disposed of off-site. It is considered that due to the small area requiring mitigation a formal Remediation Method Statement is not required, with the details in this letter providing sufficient information. The area of removal/disposal should be supervised by a suitably experienced engineer and the removal validated.

As this area of contamination is located close to the entrance to the field from the adjacent farmyard (where there is likely to have been much movement of machinery and other potentially contaminative activity) it is considered possible that there may be other areas of contamination nearby. It is therefore further recommended that any especially dark material or material with a significant anthropogenic element encountered during the topsoil strip also be stockpiled separately and subjected to further testing to confirm if it is suitable for reuse on site or not.

Following this work Hydrock now consider this matter to be satisfactorily resolved provided the recommendations noted above are followed during the development of the site and pending approval from the Local Authority.

If there are any further queries please do not hesitate to get in touch.

Yours Sincerely

Dickon Morris
Geo Environmental Engineer

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E: dickonmorris@hydrock.com

Matthew Holbourn
Senior Geo Environmental Consultant

M: 02920 023665

E: matthewholbourn@hydrock.com

Appended

1. Site Location Plan Hydrock drawing 17379-HYD-XX-XX-DR-GE-1000
2. Exploratory Hole Location Plan Hydrock drawing 17379-HYD-XX-XX-DR-GE-1004
3. Proposed Development layout HLM Architects drawing YD2-HLM-00-00-DR-L-0004
4. Hand Pit Logs HP01 to HP11
5. Laboratory Testing 21-83315-1 Ysgol Y Deri 2 C-17379-C.
6. Statistical Analysis of laboratory test results.



OS NORTH

Site Ref: ST16

P1	FIRST ISSUE	DC	02/11/20	MH	02/11/20	AE	02/11/20
REV.	REVISION NOTES/COMMENTS	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

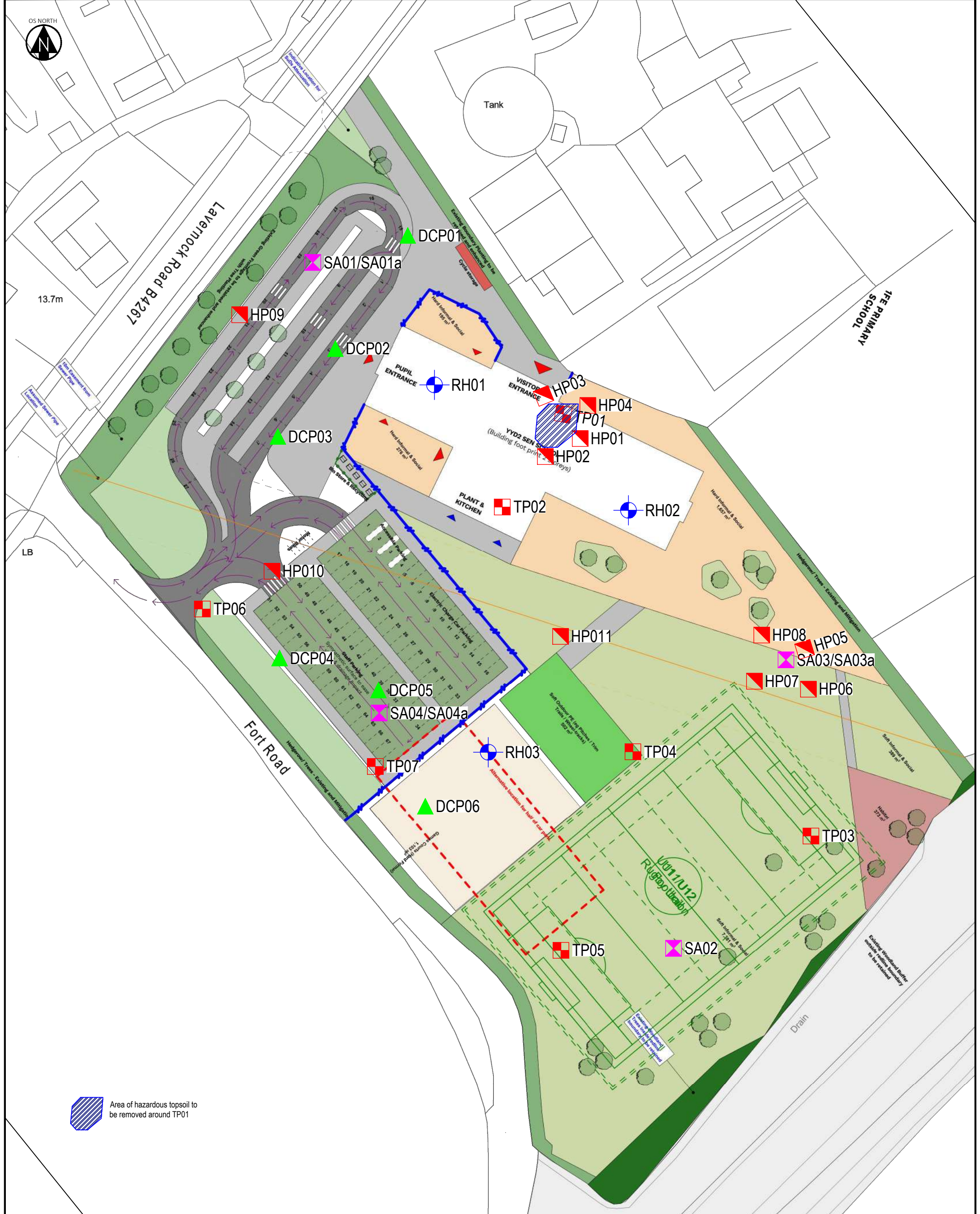
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CLIENT
AECOM

PROJECT
YSGOL Y DERI 2

TITLE SITE LOCATION PLAN	
HYDROCK PROJECT NO. C-17379-C	SCALE @ A4 1:25,000
PURPOSE OF ISSUE SUITABLE FOR INFORMATION	STATUS S2
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 17379-HYD-XX-XX-DR-GE-1000	REVISION P1



KEY	
	Site Boundary
	TRL DCP Position
	Hand Pit Position
	Rotary Borehole Position
	Soakaway Position
	Trial Pit Position

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.
3. This drawing has been based on the following drawings and information:
HLM Architects drawing YD2-HLM-00-00-DR-L-0004
4. The line of inferred geology on this drawing represents the maximum possible extent of the Lavernock Shale outcrop. It is possible it will not be present beneath the building footprint.

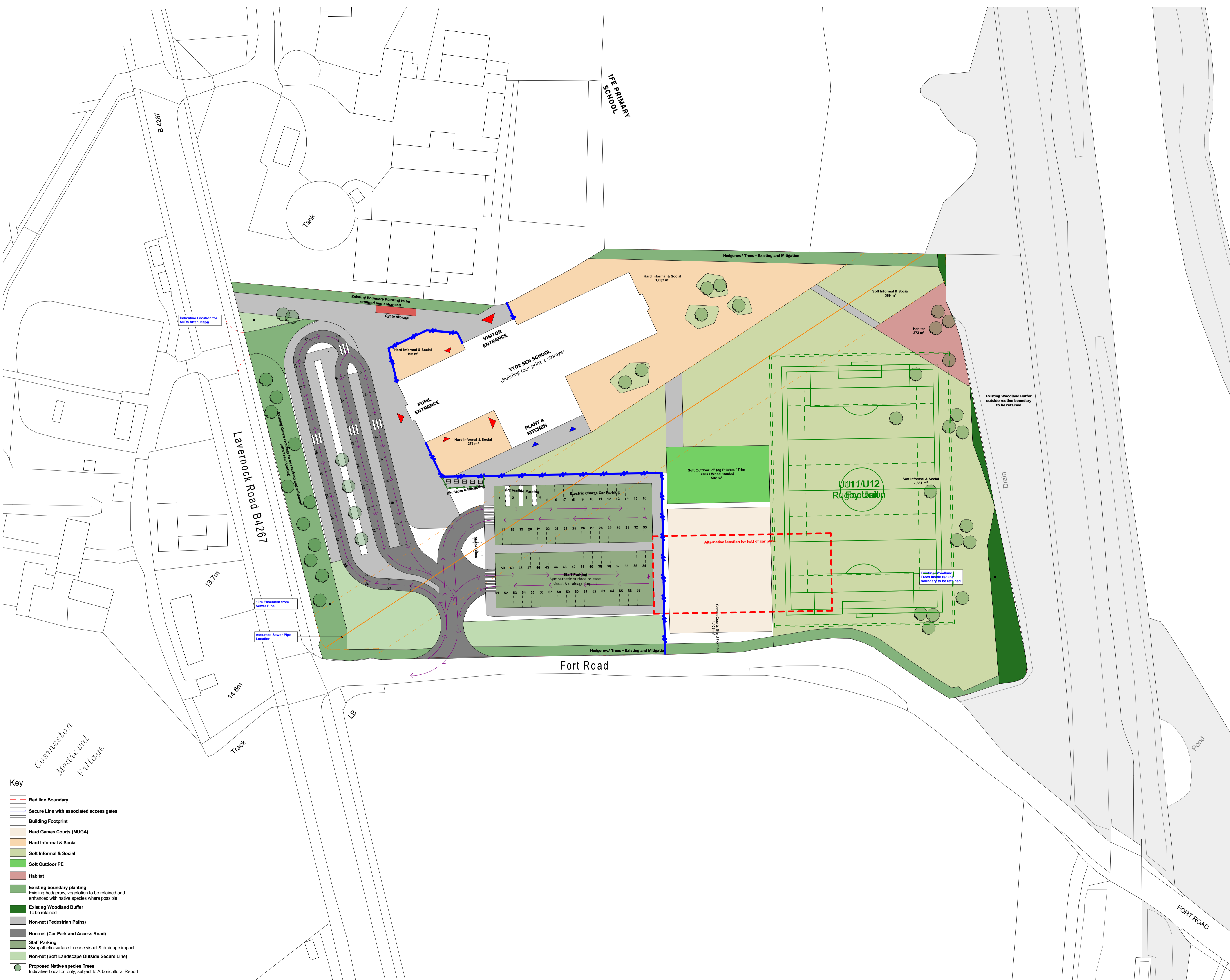
REV.	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
P2	DM	11/08/21	MH	11/08/21	AE	11/08/21
P1	DM	07/06/21	MH	11/06/21	AE	15/06/21
REVISION NOTES/COMMENTS						

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CLIENT
AECOM

PROJECT
YSGOL Y DERI 2

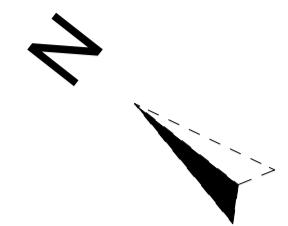
TITLE	
EXPLORATORY HOLE PLAN	
HYDROCK PROJECT NO. C-17379-C	SCALE @ A3 1:750
PURPOSE OF ISSUE SUITABLE FOR INFORMATION	STATUS S2
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 17379-HYD-XX-XX-DR-GE-1004-S2-P2	REVISION P2



- Key**
- Red line Boundary
 - Secure Line with associated access gates
 - Building Footprint
 - Hard Games Courts (MUGA)
 - Hard Informal & Social
 - Soft Informal & Social
 - Soft Outdoor PE
 - Habitat
 - Existing boundary planting
 - Existing hedgerow, vegetation to be retained and enhanced with native species where possible
 - Existing Woodland Buffer
 - To be retained
 - Non-net (Pedestrian Paths)
 - Non-net (Car Park and Access Road)
 - Staff Parking
 - Sympathetic surface to ease visual & drainage impact
 - Non-net (Soft Landscape Outside Secure Line)
 - Proposed Native species Trees
 - Indicative Location only, subject to Arboricultural Report

Notes
 Check all dimensions on site. Do not scale from this drawing. Report any discrepancies and omissions to HLM Architects. This Drawing is Copyright ©

NB:
 All details and design layout subject to provision of detailed topographical, utility, services, arboricultural and full ecological surveys.



Rev	Description	Date	AMS	By	Chk	Suitability
P01	FOR REVIEW & COMMENT	22.02.2021	AMS			

Project
15-1077-01
Ysgol Y Deri -
Primary School

Client
Vale of Glamorgan Council



Proposed Site Layout - Alternative


Drawing No. **YD2-HLM-00-00-DR-L-00004** Revision **P01**

Scale @ A1 1:500
 Date 22.02.2021
 Drawn AMS
 Checked

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Method: Hand-dug Pit	Date(s): 21/06/2021	Logged By: DM	Checked By: MH
Client: AECOM	Co-ords: 317887.18, 168882.31	Stability: Stable	Dimensions: <input type="text"/> m
Hydrock Project No: C-17379-C	Ground Level: 15.34m OD	Plant: Hand Tools	Scale: 1:10

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.35	ES			Firm dark brown slightly gravelly silty CLAY with rootlets. Gravel is fine to medium subrounded to subangular of limestone. (TOPSOIL)		(0.35)	14.99	
				Base of Excavation at 0.35m	0.35			
					1			
					2			

General Remarks:
 1) Excavated using hand tools. 2) Position located using total station GPS unit. 3) Terminated on reaching firm brown clay. 4) Backfilled with arisings.

Groundwater: Groundwater not encountered.

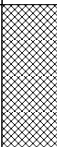

Method: Hand-dug Pit	Date(s): 21/06/2021	Logged By: DM	Checked By: MH
Client: AECOM	Co-ords: 317879.49, 168878.33	Stability: Stable	Dimensions: <input type="text"/> m
Hydrock Project No: C-17379-C	Ground Level: 15.47m OD	Plant: Hand Tools	Scale: 1:10

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.25	ES			Firm dark brown slightly gravelly silty CLAY with rootlets. Gravel is fine to medium subrounded to subangular of limestone. (TOPSOIL)		(0.25)	15.22	
				----- Base of Excavation at 0.25m				
					1			
					2			

General Remarks:
 1) Excavated using hand tools. 2) Position located using total station GPS unit. 3) Terminated on reaching firm brown clay. 4) Backfilled with arisings.

Groundwater: Groundwater not encountered.

Method: Hand-dug Pit	Date(s): 21/06/2021	Logged By: DM	Checked By: MH
Client: AECOM	Co-ords: 317879.08, 168891.62	Stability: Stable	Dimensions: <input type="text"/> m
Hydrock Project No: C-17379-C	Ground Level: 15.08m OD	Plant: Hand Tools	Scale: 1:10

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.20	ES			Soft to firm dark brown gravelly sandy CLAY with rootlets. Sand is fine and gravel is fine to medium angular to subangular of sandstone. (MADE GROUND) ... Possible dressed sandstone block in pit wall.	0.20	(0.20)	14.88	
0.20 - 0.45	ES			Firm dark brown and red mottled silty CLAY with occasional rootlets. (REWORKED NATURAL)	0.45	(0.25)	14.63	
				Base of Excavation at 0.45m				

General Remarks:
 1) Excavated using hand tools. 2) Position located using total station GPS unit. 3) Backfilled with arisings.




Method: Hand-dug Pit	Date(s): 21/06/2021	Logged By: DM	Checked By: MH
Client: AECOM	Co-ords: 317888.86, 168889.60	Stability: Stable	Dimensions: <input type="text"/> m
Hydrock Project No: C-17379-C	Ground Level: 15.31m OD	Plant: Hand Tools	Scale: 1:10

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.25	ES			Firm dark brown slightly gravelly silty CLAY with rootlets. Gravel is fine to medium subrounded to subangular of limestone. (TOPSOIL)		(0.25)	15.06	
				----- Base of Excavation at 0.25m				
					1			
					2			

General Remarks:
 1) Excavated using hand tools. 2) Position located using total station GPS unit. 3) Terminated on reaching firm brown clay. 4) Backfilled with arisings.

Groundwater: Groundwater not encountered.

Method: Hand-dug Pit	Date(s): 21/06/2021	Logged By: DM	Checked By: MH
Client: AECOM	Co-ords: 317936.72, 168835.67	Stability: Stable	Dimensions: <input type="text"/> m
Hydrock Project No: C-17379-C	Ground Level: 17.82m OD	Plant: Hand Tools	Scale: 1:10

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.30	ES			Firm dark brown slightly gravelly silty CLAY with rootlets. Gravel is fine to medium subangular to subrounded of porcelain and limestone. (TOPSOIL)		(0.30)	17.52	
				----- Base of Excavation at 0.30m	0.30			
					1			
					2			

General Remarks:
 1) Excavated using hand tools. 2) Position located using total station GPS unit. 3) Terminated on reaching firm brown clay. 4) Backfilled with arisings.

Groundwater: Groundwater not encountered.



Method: Hand-dug Pit	Date(s): 21/06/2021	Logged By: DM	Checked By: MH
Client: AECOM	Co-ords: 317937.51, 168826.99	Stability: Stable	Dimensions: <input type="text"/> m
Hydrock Project No: C-17379-C	Ground Level: 18.10m OD	Plant: Hand Tools	Scale: 1:10

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.30	ES			Firm dark brown slightly gravelly silty CLAY with rootlets. Gravel is fine to medium subangular to subrounded of charcoal, porcelain and limestone. (TOPSOIL)		(0.30)	17.80	
				----- Base of Excavation at 0.30m	0.30			
					1			
					2			

General Remarks:
 1) Excavated using hand tools. 2) Position located using total station GPS unit. 3) Terminated on reaching firm brown clay. 4) Backfilled with arisings.

Groundwater: Groundwater not encountered.



Method: Hand-dug Pit	Date(s): 21/06/2021	Logged By: DM	Checked By: MH
Client: AECOM	Co-ords: 317925.59, 168828.75	Stability: Stable	Dimensions: <input type="text"/> m
Hydrock Project No: C-17379-C	Ground Level: 17.39m OD	Plant: Hand Tools	Scale: 1:10

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.25	ES			Firm dark brown slightly gravelly silty CLAY with rootlets and a rusty nail. Gravel is fine to coarse subangular to subrounded of limestone and porcelain. (TOPSOIL)		(0.30)	17.09	
----- Base of Excavation at 0.30m					0.30			
					1			
					2			

General Remarks:
 1) Excavated using hand tools. 2) Position located using total station GPS unit. 3) Terminated on reaching firm brown clay. 4) Backfilled with arisings.

Groundwater: Groundwater not encountered.



Project: Ysgol Y Deri 2

Trialpit No

HP08

Page No. 1 of 1

Method: Hand-dug Pit	Date(s): 21/06/2021	Logged By: DM	Checked By: MH
Client: AECOM	Co-ords: 317927.21, 168838.94	Stability: Stable	Dimensions: m <input type="text"/> m
Hydrock Project No: C-17379-C	Ground Level: 17.56m OD	Plant: Hand Tools	Scale: 1:10

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.30	ES			Firm dark brown slightly gravelly silty CLAY with rootlets. Gravel is fine to coarse subangular to subrounded of limestone and porcelain. (TOPSOIL)		(0.30)	17.26	
				----- Base of Excavation at 0.30m	0.30			
					1			
					2			

General Remarks:
 1) Excavated using hand tools. 2) Position located using total station GPS unit. 3) Terminated on reaching firm brown clay. 4) Backfilled with arisings.

Groundwater: Groundwater not encountered.


Method: Hand-dug Pit	Date(s): 21/06/2021	Logged By: DM	Checked By: MH
Client: AECOM	Co-ords: 317812.08, 168909.62	Stability: Stable	Dimensions: <input type="text"/> m
Hydrock Project No: C-17379-C	Ground Level: 14.16m OD	Plant: Hand Tools	Scale: 1:10

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.25	ES			Firm dark brown silty CLAY. Gravel is fine to coarse subangular of limestone. (TOPSOIL)		(0.25)	13.91	
				----- Base of Excavation at 0.25m				
1								
2								

General Remarks:
 1) Excavated using hand tools. 2) Position located using total station GPS unit. 3) Terminated on reaching firm brown clay. 4) Backfilled with arisings.

Groundwater: Groundwater not encountered.


Method: Hand-dug Pit	Date(s): 21/06/2021	Logged By: DM	Checked By: MH
Client: AECOM	Co-ords: 317819.22, 168853.03	Stability: Stable	Dimensions: <input type="text"/> m
Hydrock Project No: C-17379-C	Ground Level: 16.00m OD	Plant: Hand Tools	Scale: 1:10

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.30	ES			Firm dark brown silty CLAY with rootlets. (TOPSOIL)		(0.30)	15.70	
				----- Base of Excavation at 0.30m	0.30			
					1			
					2			

General Remarks:
 1) Excavated using hand tools. 2) Position located using total station GPS unit. 3) Terminated on reaching firm brown clay. 4) Backfilled with arisings.

Groundwater: Groundwater not encountered.

Method: Hand-dug Pit	Date(s): 21/06/2021	Logged By: DM	Checked By: MH
Client: AECOM	Co-ords: 317882.84, 168838.65	Stability: Stable	Dimensions: <input type="text"/> m
Hydrock Project No: C-17379-C	Ground Level: 16.66m OD	Plant: Hand Tools	Scale: 1:10

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.30	ES			Soft to firm dark brown silty CLAY with rootlets. (TOPSOIL)		(0.30)	16.36	
				----- Base of Excavation at 0.30m	0.30			
					1			
					2			

General Remarks:
 1) Excavated using hand tools. 2) Position located using total station GPS unit. 3) Terminated on reaching firm brown clay. 4) Backfilled with arisings.

Groundwater: Groundwater not encountered.

<p>Site Investigation Photograph 1</p>	
<p>Date: 21/06/2021</p>	
<p>Direction Photograph Taken: n/a.</p>	
<p>Description: HP01 pit and arisings.</p>	

<p>Site Investigation Photograph 2</p>	
<p>Date: 21/06/2021</p>	
<p>Direction Photograph Taken: n/a.</p>	
<p>Description: HP02 pit and arisings.</p>	

<p>Site Investigation Photograph 3</p>	
<p>Date: 21/06/2021</p>	
<p>Direction Photograph Taken: n/a.</p>	
<p>Description: HP03 pit and arisings.</p>	

<p>Site Investigation Photograph 4</p>	
<p>Date: 21/06/2021</p>	
<p>Direction Photograph Taken: n/a.</p>	
<p>Description: HP04 pit and arisings.</p>	

<p>Site Investigation Photograph 5</p>	
<p>Date: 21/06/2021</p>	
<p>Direction Photograph Taken: n/a.</p>	
<p>Description: HP05 pit and arisings.</p>	

<p>Site Investigation Photograph 6</p>	
<p>Date: 21/06/2021</p>	
<p>Direction Photograph Taken: n/a.</p>	
<p>Description: HP06 pit and arisings.</p>	

<p>Site Investigation Photograph 7</p>	
<p>Date: 21/06/2021</p>	
<p>Direction Photograph Taken: n/a.</p>	
<p>Description: HP07 pit and arisings.</p>	

<p>Site Investigation Photograph 8</p>	
<p>Date: 21/06/2021</p>	
<p>Direction Photograph Taken: n/a.</p>	
<p>Description: HP08 pit and arisings.</p>	

<p>Site Investigation Photograph 9</p>	
<p>Date: 21/06/2021</p>	
<p>Direction Photograph Taken: n/a.</p>	
<p>Description: HP09 pit and arisings.</p>	

<p>Site Investigation Photograph 10</p>	
<p>Date: 21/06/2021</p>	
<p>Direction Photograph Taken: n/a.</p>	
<p>Description: HP10 pit and arisings.</p>	

<p>Site Investigation Photograph 11</p>	
<p>Date: 21/06/2021</p>	
<p>Direction Photograph Taken: n/a.</p>	
<p>Description: HP11 pit and arisings.</p>	



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t: 01454 619533
f: 01454 614125
e: Group Bristol cc engineer

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 : 21-83315

Project / Site name:	Ysgol Y Deri 2	Samples received on:	25/06/2021
Your job number:	C-17379-C	Samples instructed on/ Analysis started on:	25/06/2021
Your order number:	PO07868	Analysis completed by:	29/06/2021
Report Issue Number:	1	Report issued on:	29/06/2021
Samples Analysed:	12 soil samples		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
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

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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: 21-83315

Project / Site name: Ysgol Y Deri 2

Your Order No: PO07868

Lab Sample Number				1916703	1916704	1916705	1916706	1916707
Sample Reference				HP01	HP02	HP03	HP03	HP04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.35	0.00-0.25	0.00-0.20	0.20-0.45	0.00-0.25
Date Sampled				21/06/2021	21/06/2021	21/06/2021	21/06/2021	21/06/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	23	18	19	26	18
Total mass of sample received	kg	0.001	NONE	0.80	0.90	0.90	0.80	0.90

Speciated PAHs

Compound	Units	Limit of detection	Accreditation Status	1916703	1916704	1916705	1916706	1916707
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.92	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.0	0.35	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.6	0.30	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.4	0.27	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.4	0.31	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.2	0.47	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.60	0.17	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.6	0.38	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.67	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.29	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.74	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	Units	Limit of detection	Accreditation Status	1916703	1916704	1916705	1916706	1916707
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	13.3	2.25	< 0.80

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-83315
 Project / Site name: Ysgol Y Deri 2
 Your Order No: PO07868

Lab Sample Number				1916708	1916709	1916710	1916711	1916712
Sample Reference				HP05	HP06	HP07	HP08	HP09
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.25	0.00-0.30	0.00-0.25
Date Sampled				21/06/2021	21/06/2021	21/06/2021	21/06/2021	21/06/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	21	20	18	20	16
Total mass of sample received	kg	0.001	NONE	0.90	1.0	0.90	0.80	0.90

Speciated PAHs

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

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
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U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-83315

Project / Site name: Ysgol Y Deri 2

Your Order No: PO07868

Lab Sample Number				1916713	1917094
Sample Reference				HP10	HP11
Sample Number				None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30
Date Sampled				21/06/2021	21/06/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	19	22
Total mass of sample received	kg	0.001	NONE	0.90	0.90

Speciated PAHs

Compound	Units	Limit of detection	Accreditation Status	1916713	1917094
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	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.46	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.37	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.31	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.27	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.24	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.27	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.29	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	Units	Limit of detection	Accreditation Status	1916713	1917094
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	2.21	< 0.80

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-83315
Project / Site name: Ysgol Y Deri 2

* 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 *
1916703	HP01	None Supplied	0.00-0.35	Light brown loam and clay with gravel and vegetation.
1916704	HP02	None Supplied	0.00-0.25	Light brown loam and clay with gravel and vegetation.
1916705	HP03	None Supplied	0.00-0.20	Light brown loam and clay with gravel and vegetation.
1916706	HP03	None Supplied	0.20-0.45	Light brown loam and clay with gravel and vegetation.
1916707	HP04	None Supplied	0.00-0.25	Light brown loam and clay with gravel and vegetation.
1916708	HP05	None Supplied	0.00-0.30	Light brown loam and clay with gravel and vegetation.
1916709	HP06	None Supplied	0.00-0.30	Light brown loam and clay with gravel.
1916710	HP07	None Supplied	0.00-0.25	Light brown loam and clay with gravel and vegetation.
1916711	HP08	None Supplied	0.00-0.30	Light brown loam and clay with gravel and vegetation.
1916712	HP09	None Supplied	0.00-0.25	Light brown loam and clay with gravel and vegetation.
1916713	HP10	None Supplied	0.00-0.30	Light brown loam and clay with gravel and vegetation.
1917094	HP11	None Supplied	0.00-0.30	Light brown loam and clay with gravel and vegetation.

Analytical Report Number : 21-83315
Project / Site name: Ysgol Y Deri 2

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
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.	L019-UK/PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' 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.

Assessment of Chemicals of Potential Concern to Human Health



All values in mg/kg unless otherwise stated								Soil Type	TS	MG	ReW Nat
Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US ₉₅	Result of Significance Test	Location & Depth		
									HP11 0.00-0.30	HP03 0.00-0.20	HP03 0.20-0.45
Arsenic	1	6	13	20	0	40	20.10771	POTENTIALLY SUITABLE FOR USE			
Beryllium	0.06	6	1.5	1.7	0	73	1.717324	POTENTIALLY SUITABLE FOR USE			
Boron	0.2	6	1.7	4.5	0	11000	4.803565	POTENTIALLY SUITABLE FOR USE			
Cadmium	0.2	6	0.8	1.2	0	87	1.251725	POTENTIALLY SUITABLE FOR USE			
Chromium (III)	1	6	30	48	0	890	50.50027	POTENTIALLY SUITABLE FOR USE			
Chromium (VI)	1.2	6	1.2	1.2	0	6.1	1.2	POTENTIALLY SUITABLE FOR USE			
Copper	1	6	30	48	0	7300	48.38592	POTENTIALLY SUITABLE FOR USE			
Lead	1	6	42	67	0	310	75.08751	POTENTIALLY SUITABLE FOR USE			
Mercury, inorganic	0.3	6	0.3	0.3	0	56	0.3	POTENTIALLY SUITABLE FOR USE			
Nickel	1	6	29	39	0	180	40.588	POTENTIALLY SUITABLE FOR USE			
Selenium	1	6	1	1	0	600	1	POTENTIALLY SUITABLE FOR USE			
Vanadium	1	6	45	58	0	1200	60.62227	POTENTIALLY SUITABLE FOR USE			
Zinc	1	6	110	170	0	40000	176.7438	POTENTIALLY SUITABLE FOR USE			
Cyanide (free)	1	6	1	1	0	800	1	POTENTIALLY SUITABLE FOR USE			
Phenol (total)	1	6	1	1	0	2300	1	POTENTIALLY SUITABLE FOR USE			
Acenaphthene	0.05	18	0.05	3.4	0	6000	1.22645	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05
Acenaphthylene	0.05	18	0.05	3.8	0	6000	1.19763	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05
Anthracene	0.05	18	0.05	13	0	37000	4.063677	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05
Benz(a)anthracene	0.05	18	0.05	25	1	9.4	7.833277	POTENTIALLY SUITABLE FOR USE	0.05	1.4	0.27
Benzo(a)pyrene	0.05	18	0.05	18	3	1.6	5.715578	FURTHER ASSESSMENT REQUIRED	0.05	1.6	0.38
Benzo(b)fluoranthene	0.05	18	0.05	28	1	11	8.863766	POTENTIALLY SUITABLE FOR USE	0.05	2.2	0.47
Benzo(ghi)perylene	0.05	18	0.05	11	0	72	3.490001	POTENTIALLY SUITABLE FOR USE	0.05	0.74	0.05
Benzo(k)fluoranthene	0.05	18	0.05	8.2	0	16	2.619124	POTENTIALLY SUITABLE FOR USE	0.05	0.6	0.17
Chrysene	0.05	18	0.05	24	1	15	7.524239	POTENTIALLY SUITABLE FOR USE	0.05	1.4	0.31
Dibenz(a,h)anthracene	0.05	18	0.05	3.5	1	1.4	1.127126	POTENTIALLY SUITABLE FOR USE	0.05	0.29	0.05
Fluoranthene	0.05	18	0.05	53	0	1600	16.82761	POTENTIALLY SUITABLE FOR USE	0.05	2	0.35
Fluorene	0.05	18	0.05	6.1	0	4500	2.055481	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05
Indeno(1,2,3-cd)pyrene	0.05	18	0.05	10	1	6.7	3.181605	POTENTIALLY SUITABLE FOR USE	0.05	0.67	0.05
Naphthalene	0.05	18	0.05	1.8	0	13	0.753295	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05
Phenanthrene	0.05	18	0.05	48	0	1500	15.5522	POTENTIALLY SUITABLE FOR USE	0.05	0.92	0.05
Pyrene	0.05	18	0.05	41	0	3800	12.98158	POTENTIALLY SUITABLE FOR USE	0.05	1.6	0.3
Asbestos identified	Y/N										
FOC (dimensionless)	0.034	(mean)									
SOM (calculated)	5.86%	(mean)									
pH (su)	6.9	(mean)									

Risk parameter: Human health - residential without plant uptake (6%SOM)
Data set: Topsoil / Organic Rich Material
Client: AECOM
Site: Ysgol Y Deri
Job no.: C-17379-C
Lab. report no(s): 21-77003-1, 21-83315