

Land at Craig Y Parcau

Bridgend

Flood Consequence Assessments (FCA)

October 2025

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1.0 INTRODUCTION

1.1 APPOINTMENT AND BRIEF

- 1.1.1 Healer Surveys Ltd has been commissioned by Bellway Homes Ltd Wales to undertake a site-specific Flood Consequence Assessments (FCA) the proposed residential development at the site at Craig Y Parcau, Bridgend.

1.2 OBJECTIVE OF STUDY

- 1.2.1 This Flood Consequence Assessment (FCA) has been prepared in support of a proposed residential development at Craig-y-Parcau, Bridgend. The purpose of the FCA is to assess the potential flood risks affecting the site and to demonstrate compliance with the requirements of Technical Advice Note 15 (TAN-15, 2025) and the policies of Planning Policy Wales (Feb 2024).

The assessment considers fluvial, pluvial, and residual flood risks and proposes appropriate mitigation measures to ensure that the development remains safe for its lifetime, without increasing flood risk elsewhere.

- 1.2.2 The study assesses flood risk to:
- The Site and the proposed residential development; and
 - Any impact on flood risk to any adjacent land as a result of the development.
- 1.2.3 Where required, flood risk mitigation measures have been proposed. The report also provides an outline drainage strategy for the foul and surface water flows from the proposed development site.
- 1.2.4 The report has been prepared to accompany a planning application.

1.3 STUDY METHODOLOGY

- 1.3.1 The appraisal process consisted of a desk study, data research and consultation with the regulatory authorities and third parties. A site visit has been undertaken together with a site topographical survey to assess the general topography of the area and to identify any potential flood risk features that could affect the site.
- 1.3.2 A list of documents referred to, to obtain data in relation to the site and development is given in **APPENDIX A**.
- 1.3.3 This is an assessment of potential flooding from all possible sources, including

fluvial, tidal, surface run-off, overland flows, groundwater, sewers and manmade infrastructure. The assessment also identifies and examines the residual flood risk to the proposed development.

- 1.3.4 Local and national guidance research has been undertaken and requirements assessed.

In particular relating to the design of the surface water system PPW states in Clauses 6.6.18/19:

“The provision of SuDS must be considered as an integral part of the design of new development and considered at the earliest possible stage when formulating proposals for new development.¹⁵³ In guiding new development the planning system should at the very least ensure the incorporation of measures at an individual site scale, particularly in urban areas, in order to secure cumulative benefits over a wider area. A concerted effort of this nature will bring benefits over a whole catchment. At a development plan level, however, there will be considerable advantages associated with developing collaborative approaches which, drawing on evidence obtained through green infrastructure assessments, integrate SuDS as part of growth strategies for particular areas.”

“Development proposals should incorporate design for surface water management, based on principles which work with nature to facilitate the natural functioning of the water cycle, providing issues such as land contamination would not result in the mobilisation of contaminants which may have an impact over a wider area. Design for multiple benefits and green infrastructure should be secured wherever possible and as part of Green Infrastructure Assessments suitable approaches towards the provision of SuDS should be identified. It may, in some circumstances, be necessary for ‘hard’ infrastructure solutions to be preferred because of practical or archaeological considerations but taking into account the role of water services in contributing to the quality of place, nature-based solutions should be the preference.”

1.4 LIMITATIONS

- 1.4.1 A detailed survey of the existing drainage and confirmation of connectivity had not been undertaken as part of this study.

2.0 EXISTING SITE

2.1 SITE LOCATION

2.1.1 The site is situated south of the existing Broadlands estate at Craig Y Parcau in Bridgend centred on a National Grid Reference of 289002, 178650. It occupies a plan area of approximately 6.9 hectares.

See **APPENDIX B** for site location plan and red line boundary.

2.2 SITE DESCRIPTION

2.2.1 Table 2.1 describes the general characteristics.

Table 2.1: Characteristics of the site

Area		The site currently comprises two areas separated by an ancient woodland/SINC zone. The eastern area, mainly grassed fields, comprises two dilapidated buildings and a concrete access from the lane to the south. The western parcel contains open grass fields.
General Topography		The western parcel falls at approx. 1:12 west to east with the low point in the northeastern corner. There is a high point in the eastern field, with gradient falling away to the boundaries.
Existing Surfacing		Grass covered field with used for grazing sheep. There are two existing buildings that are to be demolished, a watercourse through the centre of the site within a valley, and an access road at the southern boundary rising into site.
Boundaries	North	Dilapidated wooden fence to trees/woodland and further beyond an industrial estate
	East	Dilapidated wooden fence to further grass covered fields
	South	The southern boundary of the site is defined by an upward embankment leading up to the A4281
	West	Stone wall boundary to outbuildings and further grass covered fields
Access		Off existing A48 roundabout southern arm

2.2.2 See **APPENDIX C** for the topographical survey of the site and **APPENDIX P** for the Tree Constraints Plan.

3.0 EXISTING DRAINAGE

3.1 EXISTING FOUL DRAINAGE

- 3.1.1 There is an existing 300mm diameter public foul sewer running along the northern boundary of the development, on the northern side of the A48 carriageway, continuing underneath the River Ogwr to the east.

The exact location of this apparatus has not been the subject of a CCTV sewer Survey or radar survey to date.

- 3.1.2 A check is to be undertaken with Dwr Cymru Welsh Water in relation to the ability of the capacity of the existing network to accept addition of the proposed development. The Local Development Plan (LDP) states that:

Public Sewerage - There should be no issue with the public sewerage network accommodating the foul-only flows from this development site. The site is traversed by a 350mm foul sewer for which protection measures will be required in the form of an easement width or diversion.

WwTW (Wastewater Treatment Works) - There should be no issue with Penybont (Merthyr Mawr) WwTW accommodating the foul-only flows from this development.

- 3.1.3 Initial enquiries have been made with Dwr Cymru Welsh Water. Records are included in **APPENDIX D**.

3.2 EXISTING SURFACE WATER DRAINAGE

- 3.2.1 There is an existing 1500mm concrete surface water sewer along the northern boundary of site on the southern side of the A48 carriageway.

3.3 WATERCOURSES

- 3.3.1 An existing watercourse flows north to south through the centre of the development within a SINC and Ancient Woodland designated area approximately 4-6m below the developable land areas. The unnamed watercourse outfall from the development area conveyed to the opposite side of 'New Inn Road', to the south of site, via a twin pipe culvert as shown overleaf:



Debris within the existing twin culvert outfall – taken 27/10/2025

The watercourse continues along a shallow depression, south of 'New Inn Road', before discharging to the River Ogwr to the East.

- 3.3.2 The topographical survey and DCWW map indicates the watercourse discussed above, which enters the site from the north under the existing A48 roundabout from the vicinity of the Broadlands development. The survey is contained within the document appendices.

3.4 GEOLOGY AND HYDROGEOLOGY

- 3.4.1 Terraforma produced a Tier 2 Geotechnical and Geoenvironmental Assessment in December 2024. The general geology reviewed from the site investigation revealed the following.
- 3.4.2 Made Ground located around the former Craig-y-Parcau buildings was found to contain a number of contaminants that were found above generic assessment criteria for a residential setting. In addition, Chrysotile fibre clumps were recorded in one sample of made ground. A Stockpile of excavated soil located in the compound of Craig-y-Parcau was also found to contain elevated levels of PAH.

Given the recorded concentrations of contamination and limited access to parts of the site, it is recommended that a Tier 3 Assessment is completed before moving onto a Stage 2 Options Appraisal and Remediation Strategy.

The objectives of the Tier 3 assessment are to:

- Investigate the extent of made ground and contamination within the made ground
- Investigate areas previously inaccessible or restricted
- Derive site specific assessment criteria

3.4.3 During the investigation fifteen samples of the shallow cohesive material was obtained and submitted for plasticity and moisture content testing.

3.4.4 During the site investigation three soakaway tests were undertaken in general accordance with BRE DG 365:2016. The soakaway test results are presented in Table 8.1 of the report, included within the appendices documents for reference.

Further information on the testing carried, the location of tests and the report can be found within **APPENDIX J**.

3.4.5 Given the risk of dissolution in the Blue Lias formation, it is recommended that proposed soakaways must be positioned at least 10.0m away from any structure.

3.5 HISTORICAL LAND USES

3.5.1 A study of historical Ordnance Survey maps has revealed that the site and surrounding land previously had many uses.

Most of the area was farmland, with small fields for pasture and arable farming. Bridgend historically had coal mining and industrial activity, but Craig-y-Parcau itself was largely undeveloped woodland and farmland.

Now, it's designated as a Site of Importance for Nature Conservation (SINC). The land is primarily woodland, scrub, and grassland, supporting biodiversity and public recreation.

Some remnants of historical features, like old hedgerows or pathways, can still be seen. Historically, Craig-y-Parcau was mainly agricultural and estate land, with scattered woodland. Over time, it transitioned to conservation and recreational use, preserving much of its natural landscape.

3.6 HISTORICAL FLOOD RECORDS

3.6.1 No history of flooding has been located, only the NRW advice map that indicates flood risk from a minor watercourse.

3.7 FLOOD MAPPING

3.7.1 TAN 15 Flood Risk provides further detail to PPW and identifies four zones of potential flood risk:

- **Zone 1:** Less than 1 in 1,000 (0.1%) annual chance of river flooding (plus climate change) etc.
- **Zone 2:** Between 0.1% and 1% (rivers) or equivalent for sea/surface water.
- **Zone 3:** Greater than 1% (rivers) or 0.5% (sea) etc.
- **Defended Zone:** Areas protected by flood-defences but still subject to residual risk.

National Resources Wales (NRW) Planning map defines these zones.

According to NRW Development Advice Map (DAM) and Flood Map for Planning (FMfP), a small part of the extreme southern corner of the site is identified as being within Flood Zone C2 (DAM) and Flood Zone 3 (FMfP). This portion of the site lies outside the area proposed of development. The FMfP also identify a small area of the site as being at risk of flooding from surface water/small watercourses.

Drawing '3954-SK003 - Flood Zone Overlay' shows an overlay of the proposed development with the flood zone mapping, illustrating that the development is not within the critical areas. The lowest Finished Floor Level (FFL) of the proposed development is at 20.300m, while the watercourse in question discharges from the development area via a twin pipe culvert at approx. 11.220m, over 9m below plot levels. This extreme level difference will protect any plots from potential flooding.

3.7.2 Refer to **APPENDIX F** for flood maps and supporting information.

3.7.3 Flood zone designations ignore the presence of any flood defences and only consider flooding from fluvial and tidal sources.

3.8 SITE WALKOVER

3.8.1 A site walkover has been conducted individually and with the SAB officer.

3.8.2 The site currently comprises two grass covered fields with used for grazing sheep. There are two existing buildings that are to be demolished and an access road at the southern boundary rising into site.

The existing watercourse within the valley separating the parcels contains an ancient woodland/SINC zone.

See **APPENDIX B** for site location plan and **APPENDIX C** for the topographical survey.

4.0 PROPOSED DEVELOPMENT

4.1 DESCRIPTION

- 4.1.1 The proposed development of 6.90 Ha in total area is to be serviced from a proposed single access from an existing roundabout on the A48. The proposal comprises up to 120 houses from one-bedroom flats to three/four bedroom in size with associated roads, sewers, and private driveways.
- 4.1.2 It is proposed to maintain the existing boundary landscape features. In general, the site falls in an east to west direction in the western parcel and to the boundaries on each side of the eastern parcel due to a high point at the location of the existing buildings. The existing flow route of the surface water and site Constraints can be seen within **APPENDIX E**. The proposed plot levels will be determined to suit site conditions.
- 4.1.3 It is also proposed to dispose of surface water using SUDS techniques. Typical SUDS features to be proposed can be seen in **APPENDIX M**.

A proposed drainage strategy/layout is included in **APPENDIX K**, which shows a planning layout for the proposed development.

5.0 PLANNING & POLICY CONTEXT

5.1 NATIONAL POLICY:- PLANNING POLICY WALES (PPW)

- 5.1.1 PPW sets out the requirements for flood consequence assessments in Wales. TAN 15 Appendix 1

A) Objectives of the Assessment

The prime objective of an assessment is to develop a full appreciation of:

- The consequences of flooding on the development*
- The consequences (i.e. the overall impacts) of the development on flood risk elsewhere within the catchment for a range of potential flooding scenarios up to that flood having a probability of 0.1%*
- The assessment can be used to establish whether appropriate mitigation measures can be incorporated within the design of the development to ensure that development minimises risk to life, damage to property and disruption to people living and working on the site or elsewhere in the floodplain.*

5.2 REGIONAL POLICY AND LOCAL POLICY

- 5.2.1 Bridgend Flood Risk Management Plan - Local Flood Risk Investigation Areas (August 2016) are included in **APPENDIX N**. The BCBC LFRMP/S discusses appropriate mitigation measures to maintain Greenfield run-off so as not to exacerbate the potential for any flooding.

5.3 THE SEQUENTIAL TEST

- 5.3.1 As previously identified in Section 3.7.1 the proposed development Site off A48 at Craig Y Parcau, Bridgend is located primarily in Flood Zone 1 however partially within Flood Zone 2/3. Due to the extreme level difference between the watercourse and proposed development the site is deemed to not be at risk of flooding.

5.4 STRATEGIC FLOOD RISK ASSESSMENT

- 5.4.1 The proposed development site is located within primarily zone 1 however there is an element of zone 2/3 where the watercourse dissects the site. Flood Zones as shown in the BCBC LFRMS and as shown on the National Resources Wales map in **APPENDIX F**. Due to the extreme level difference between the watercourse and proposed development the site is deemed to not be at risk of flooding therefore no further mitigation is required.

6.0 ASSESSMENT OF POTENTIAL SOURCES OF FLOODING

6.1 DEVELOPMENT SITE

- 6.1.1 This chapter identifies, assesses, and quantifies (as far as practicably possible), potential sources and mechanisms which are assessed to determine their flood risk and where possible a statement given stating the considered level of risk – negligible, low or significant.

6.2 FLUVIAL

- 6.2.1 The site lies within Flood Zone 1 with partial zones 2/3 along the existing watercourse location. Due to the extreme level difference between the watercourse and proposed development the site, between 4-9m+, it is deemed to not be at risk of fluvial flooding.

6.3 TIDAL

- 6.3.1 The site is not near the coast or tidal estuary. It is many metres above sea level. Consequently, there is a negligible risk of flooding from coastal sources.

6.4 OVERLAND FLOWS AND FLOODING FROM LAND

- 6.4.1 The site slopes generally from the West to east in the western parcel and from the centre of the eastern parcel to the boundaries. The existing watercourse within a valley dissecting the centre of the development is between 4m at the north to 9m+ at the southern end of the development below proposed dwelling levels. The existing surface water entering the development site from the north from the existing carriageway/roundabout will be maintained.
- 6.4.2 On-Site flooding from the proposed development drainage is unlikely to be a significant risk as it is proposed as set-out in Section 7 to attenuate development flows within SUDS features prior to exiting site through the existing outfall which is situated significantly lower than the proposed site levels.

6.5 GROUNDWATER

- 6.5.1 No groundwater was encountered within testing.
- 6.5.2 Further groundwater checks are being commissioned at the location of the proposed basins.

6.6 FLOODING AND DRAINAGE

- 6.6.1 There is an existing 150mm diameter VC public combined sewer running

north west to south east along Nant-Y-Croft in to Rassau Road in close proximity to the south western corner of site.

The exact location of this apparatus has not been the subject of a CCTV sewer Survey or radar survey to date.

- 6.6.2 A check is to be undertaken with Dwr Cymru Welsh Water in relation to the ability of the capacity of the existing network to accept addition of the proposed development.
- 6.6.3 An existing 600mm diameter concrete surface water culvert enters the site within the north western corner. An existing minor watercourse flows south along the western boundary of site with an outfall to an existing concrete culvert approx. 600mm diameter (*to be confirmed*) located in the south western corner of the development land.
- 6.6.4 The topographical survey indicates '*piped drainage*' in the south western section of the site, also outfalling to the existing culvert, which have been identified as private drainage from the sheds located on adjacent land.
- 6.6.5 The DCWW Sewer records are included in **APPENDIX D** for information.
- 6.6.6 Natural Resource Wales Flood Risk Assessment Wales Map indicates that the potential flooding risk for this development is limited to the minor watercourse along the western boundary. This watercourse is to be maintained and development limited in this area. The Flood Risk Assessment Wales Map can be seen in **APPENDIX G**.

6.7 CANALS, RESERVOIRS AND OTHER INFRASTRUCTURE

- 6.7.1 There are no reservoirs or other such infrastructure in the vicinity.

7.0 PROPOSED DEVELOPMENT AND FLOOD RISK MANAGEMENT

7.1 FLUVIAL

- 7.1.1 The fluvial risk to the development is low due to level differences to the development site.

7.2 TIDAL

- 7.2.1 There is no Tidal flood risk; therefore, flood risk mitigation is not required.

7.3 OVERLAND FLOW

- 7.3.1 Having examined the local topography, the risk of overland flow and flooding from adjacent land is negligible.

The SUDS features proposed within the development are designed to deal with surface water at source and extend the time in which the water takes to reach the outfall location. The existing flow routes, see **APPENDIX E**, have been considered during the design stage to ensure that overland flows have access routes to reach the outfall location should blockages/failures occur in the system.

- 7.3.2 A flood exceedance plan will also be produced to indicate the overland flow routes should the 1in100 year storm event + climate change % design criteria be surpassed.

7.4 GROUNDWATER

- 7.4.1 With reference to section 6.5 and the records of the site ground investigation, it is not anticipated that flood risk mitigation will be necessary.

7.5 FLOODING FROM SEWERS AND DRAINS

- 7.5.1 No existing sewers and drains are present on site. All sewers and drains are to be designed and installed to Sewers for Adoption 8th Edition and to local authority specification.

7.6 OUTLINE DRAINAGE STRATEGY

Sustainable Drainage Systems.

- 7.6.1 All development presents opportunity to incorporate sustainable surface water drainage systems, which might include infiltration techniques or attenuation of flows to protect receiving sewers or watercourses. The choice of methods is dependent upon ground conditions and availability of suitable areas within the particular scheme layout.
- 7.6.2 The development proposals will incorporate sustainable drainage solutions to dispose of surface water runoff. The guidance given in the CIRIA report C697 “The SUDS Manual” will be followed during the detailed design of the proposed sustainable drainage solution. Runoff will be managed both at source and across the Site as a whole. SUDS will incorporate pollution control facilities to improve water quality.
- 7.6.3 Requirement H3 Part 3 of the Building Regulations Approved Document H (2010 Edition) states:
- (3) Rainwater from a system provided pursuant to sub-paragraphs (1) and (2) should discharge to one of the following listed in order of priority:
 - (a) An adequate soakaway or some adequate infiltration system; or, where this is not reasonably practicable,
 - (b) A watercourse; or where this is not reasonably practicable,
 - (c) A sewer.
- 7.6.4 This development presents an opportunity to incorporate sustainable surface water drainage systems to employ SUDS techniques to accommodate both highway and domestic surface water.
- 7.6.5 The Tier 2 Geotechnical and Geoenvironmental Assessment includes a small number of infiltration test results, to BRE 365 guidance, however the results are inconsistent and not within areas where surface water is proposed to be concentrated.

This document also states, ‘Given the risk of dissolution in the Blue Lias formation, it is recommended that proposed soakaways must be positioned at least 10.0m away from any structure.’

The soakaway test undertaken by Terrafirma, (TF-24-589-CA’), in December 2024 was part of their site investigation and are annexed to this report **APPENDIX J**. Mixed infiltration rates were recorded on site, the breakdown of the testing procedure/outcome can be seen in **APPENDIX J**. The use of soakaway drainage is not believed to be possible on this development however further tests have been commissioned at the location of the basins to further assess the potential.

- 7.6.6 Proposed SUDS features to be incorporated into the surface water system designed for the development are indicated in **APPENDIX M**.
- 7.6.7 Please refer to **APPENDIX K** for the drainage strategy plan.
- 7.6.8 Maintenance activities in relation to the SUDS features will be the responsibility of the adopting authority, while responsibilities for private features such as water butts, SuDS planters and permeable paving will be that of the homeowner.

- 7.6.9 Foul water flows will be drained to the existing 150mm diameter combined public sewer located south of the development site.
- 7.6.10 DCWW are to be contacted in relation to the available capacity within the existing drainage network and treatment works however this has been considered within the BCBC LDP.

Within the Bridgend Local Development Plan (LDP) 2018-2033 the document '*Statement of Common Ground, between Bridgend County Borough and Dwr Cymru (Welsh Water)*' which is an agreement between Bridgend County Borough Council And Dwr Cymru Welsh Water the following is stated for Craig Y Parcau:

Public Sewerage - *There should be no issue with the public sewerage network accommodating the foul-only flows from this development site. The site is traversed by a 350mm foul sewer for which protection measures will be required in the form of an easement width or diversion.*

WwTW (Wastewater Treatment Works) - *There should be no issue with Penybont (Merthyr Mawr) WwTW accommodating the foul-only flows from this development.*

7.7 RESIDUAL FLOOD RISK

- 7.7.1 The main residual flood risks for the proposed development are rainfall events greater than the design criteria and blockages in the existing and proposed drainage systems.
- 7.7.2 Site levels will be designed to ensure that any resulting overland flow will run within driveways and road corridors allowing drainage to avoid property flooding.
- 7.7.3 The residual flood risk is therefore considered to be low.

8.0 CONCLUSIONS

- 8.1.1 This report demonstrates that the proposed development site is at negligible risk of flooding from all sewers and water courses within close proximity of the site.
- 8.1.2 No mitigation measures are required, with no impact on flood risk to other land provided that the site levels are carefully designed.
- 8.1.3 Access and egress through the site of the proposed development can be provided safely with no significant residual flood risk to the site or surrounding areas.
- 8.1.4 Surface water from the proposed development will discharge to SUDS features initially prior to a storage basin which will in turn discharge at a greenfield run off rate of Q_{bar} via a flow control device for storms up to and including the 100-year event plus 40% allowance for future climate change. This represents a significant betterment on the current situation and ensures that the proposed development is reducing flood risk to the downstream catchment. Attenuation storage will be provided within the soakaway systems.
- 8.1.5 Foul water from the proposed development will discharge into the existing 150mm diameter DCWW foul sewer, located within the footway of the southern side of the A48 to the northern boundary of site.

APPENDIX A

- A List of documents
- B Site Location Plan & Site Red Line Boundary Plan
- C Topographical Survey (S24090-002-0)
- D Dwr Cymru Welsh Water records
- E Constraint and Opportunities Plan (P24-1590-DE-01)
- F Flood Zone Overlay & NRW Flood Maps
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- P Tree Constraints Plan A3 Craig Y Parcau, Bridgend

APPENDIX B

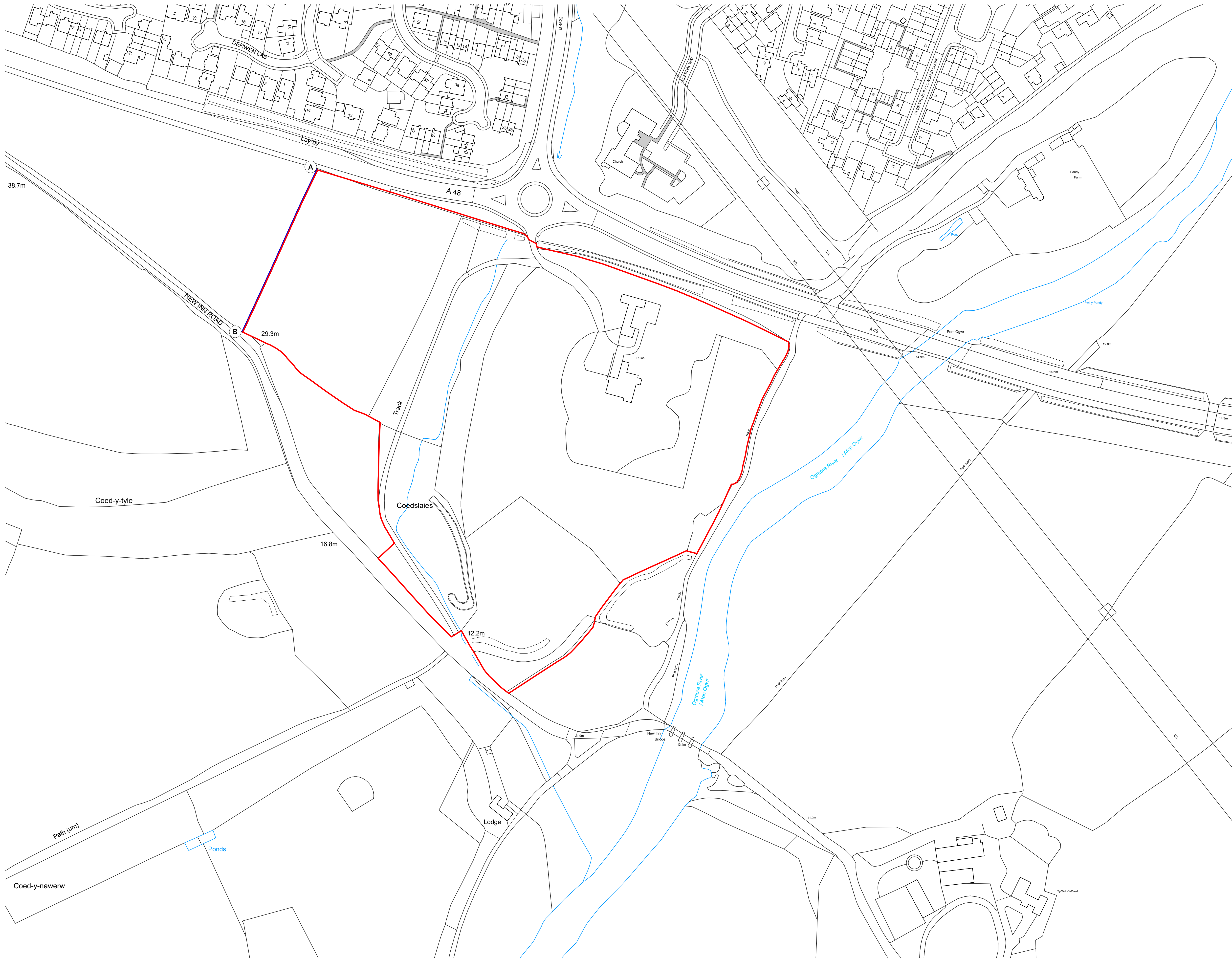
Site Location Plan & Site Red Line Boundary Plan

1.2 – Craig Y Parcau, Bridgend – Location Plan



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ISSUE:



KEY: SITE LOCATION PLAN

- APPLICATION BOUNDARY
- RANSOM STRIP
- A NORTHERN CORNER
- B SOUTHERN CORNER

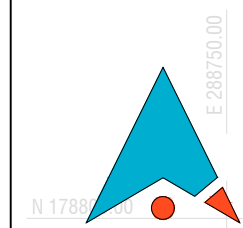
CRAIG Y PARC - SITE LOCATION PLAN



| PEGASUSGROUP.CO.UK | TEAM/DRAWN BY: ST | APPROVED BY: MFA | DATE: 25/11/2024 | SCALE: 1:1250@A1 | DRWG: P24-1590_DE_O3_B_2 | CLIENT: BELLWAY |

APPENDIX C

Topographical Survey (S24090-002-0)



- GENERAL NOTES**
- The contractor is to check and verify all buildings and site dimensions and levels, including existing sewer invert levels, before works start on site. The contractor is to comply in all aspects with the current building legislation, British Standards, building regulations etc.
 - Positions of existing services/statutory undertakers apparatus adjacent to or crossing proposed excavations are to be checked by the contractor prior to starting work. Utility locations shown are to be verified by the contractor prior to commencement of work.
 - This drawing is to be read in conjunction with and checked against all other drawings, engineering details, specifications and any structural, geotechnical or other specialist document provided.
 - Any anomaly or contradictions between any of the above is to be reported immediately to Corner Point Surveys Ltd.
 - This survey has been undertaken to OS National Grid & Datum (OSTN15) with a calculated local scale factor for this location.

LEGEND				
BUILDINGS	CANOPY	CPY	EV	EAVES
	DOWNPIPE	DP	GUT	GUTTER
	DOORLINE	DCL	PFL	ROOF LINE
	WINDOW LINE	WOL	VP	VENT PIPE
BOUNDARIES	ARMO BARRIER	AB	HS	HOARDING / HEDGE
	BARRIER	BAR	RFW	POST & RAIL FENCE
	BRICK WALL	BW	PF	POST & WIRE FENCE
	CLOSE BOARD FENCE	CBF	RW	RETAINING WALL
TOPOGRAPHY	HEDGE	HL	RE	RETAINING WALL
	BANK BASE	BB	TR	TRAIL
	BANK TOP	BT	VEG	VEGETATION
	BOLLARD	BD	TP	TELECOM POST
STREET FURNITURE	LAMP POST	LP	KB	HERB BASE
	TACTILE PAVING	TPV	LP	LAMP POST
	DROP KERB	DKB	FO	FOOTPOST
	FOOTPATH	FP	RP	REFLECTOR POST
UTILITIES	ROAD SIGN	RS	TRV	TACTILE PAVING
	AC/DRAIN	AD	OV	OVERHEAD
	BT MANHOLE	BT	IC	INSPECTION CHAMBER
	CABLE TV	CTV	MA	MANHOLE
STRUCTURE	ELECTRICITY BOX	EB	SDR	SLOT DRAIN
	EARTH ROD	ER	SV	STOP VALVE
	FIRE HYDRANT	FH	W	WATER UTILITY
	GULLY	GU	CON	CONTAINER
GENERAL	COLUMN	C	ST	STEEL
	CONCRETE PUNTH	CP	BT	BRIE
	APPROXIMATE	A	RL	ROSE LEVEL
	APR LEVEL	AL	DOT	SCOFF LEVEL
	BED LEVEL	BL	UTL	UNABLE TO LIFT
	COVER LEVEL	CL	UTS	UNABLE TO SURVEY
	SAVES LEVEL	EL	VL	WATER LEVEL
	FLOOR LEVEL	FFL	4	CONTROL STATION
	HEIGHT	HT	0	DWATER
	INVERT LEVEL	IL		GATE



CONTROL STATIONS		
STN0	288997.183	178742.937
STN1	288836.155	178778.519
STN2	289175.079	178674.239
STN3	288991.207	178711.503
STN4	289035.606	178684.783
STNA	289044.999	178650.279
STNB	289053.870	178650.125
STNC	289034.985	178670.184
STNA	288970.577	178708.567
STNG	288945.499	178432.619
STN1	289004.424	178445.784

Rev	Date	Description	By
1		Dimensions to be verified on site. This drawing should not be scaled. Use figures dimensions only. Any discrepancies should be referred to the Engineer prior to work being put in hand. This drawing is copyright.	



CornerPoint
SURVEYS

Corner Point Surveys Limited
Cauldwell Road, Village Way
Greenhead Business Park
Cauldwell
CP16 7HG

020 30 880 180
corner@cornerpointsurveys.co.uk
www.cornerpointsurveys.co.uk



Project: **CRAIG Y PARCAU**

Title: **TOPOGRAPHICAL SURVEY**

INFORMATION

Drawn By	Checked By	Date	Scale
JPW	ACV	JAN25	1:500
Project No	Drawing No	Revision	
S24090	002	0	

APPENDIX D

Dwr Cymru Welsh Water records



LEGEND(Representative of most common features)

Waste network:			
Fault chamber	Surface water chamber	Disfall	
Combined chamber	Combined sewer overflow	Lamp hole	
Special purpose chamber	Treatment works	Storm Overflow	
Pumping station	Sewer	Rising main	
Sewer	Sewer	Gravity sewer	
Sewer	Sewer	Private sewer	
Sewer	Sewer	Private sewer subject to 5km. 100 selection agreement	
Sewer	Sewer	Private Sewer Transfer	
Sewer	Sewer	Lateral Drain	
Sewer	Sewer	Inspection Chamber	

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation.

Dŵr Cymru Cyfyngedig (the Company) gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

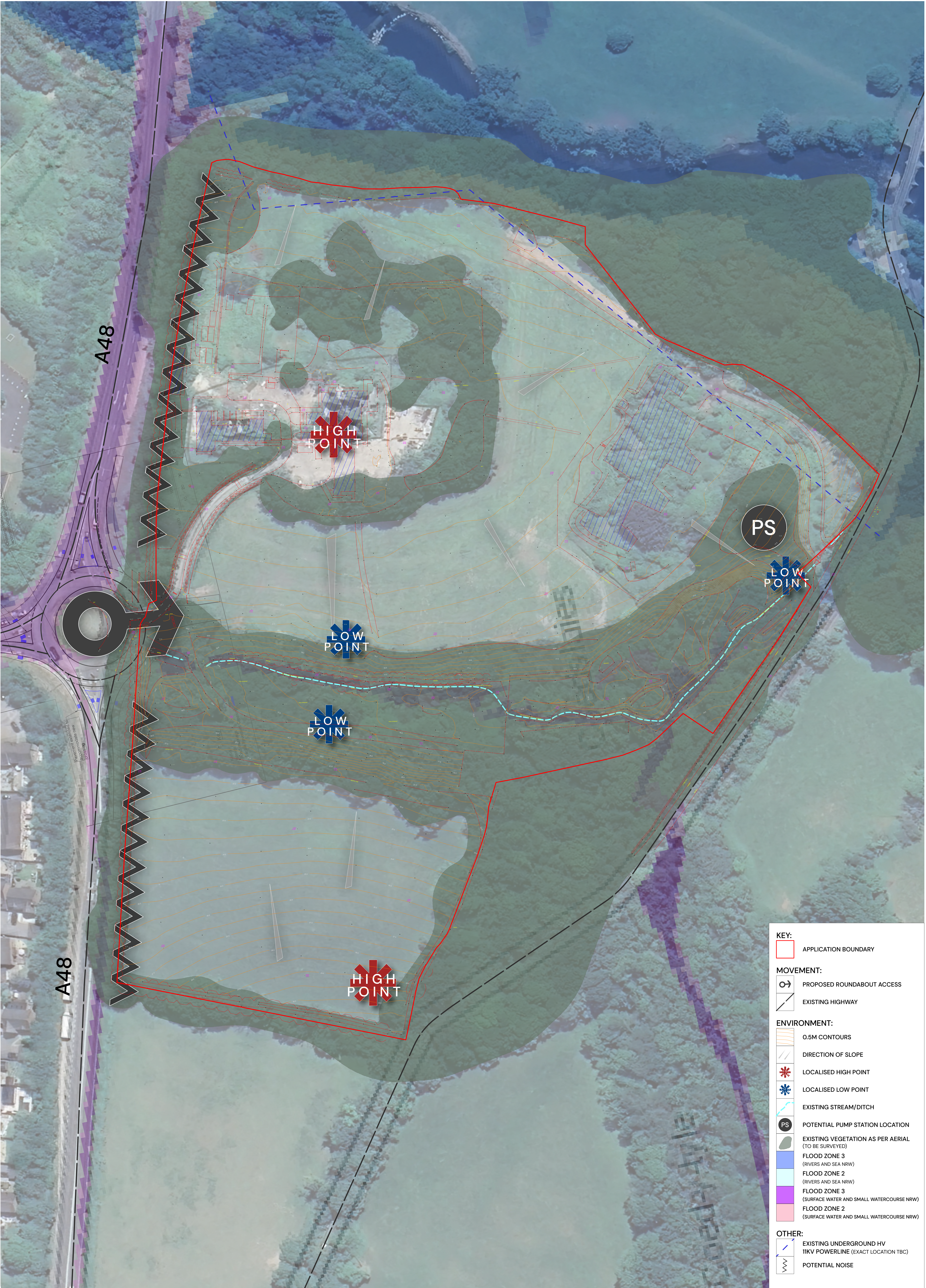
**EXACT LOCATIONS OF ALL APPARATUS
TO BE DETERMINED ON SITE.**

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Map Ref: 288976,178710
Map scale: 1:2000
Printed by: Vefa Fox
Printed on: 16 Jul 2025

APPENDIX E

Constraint and Opportunities Plan (P24-1590-DE-01)

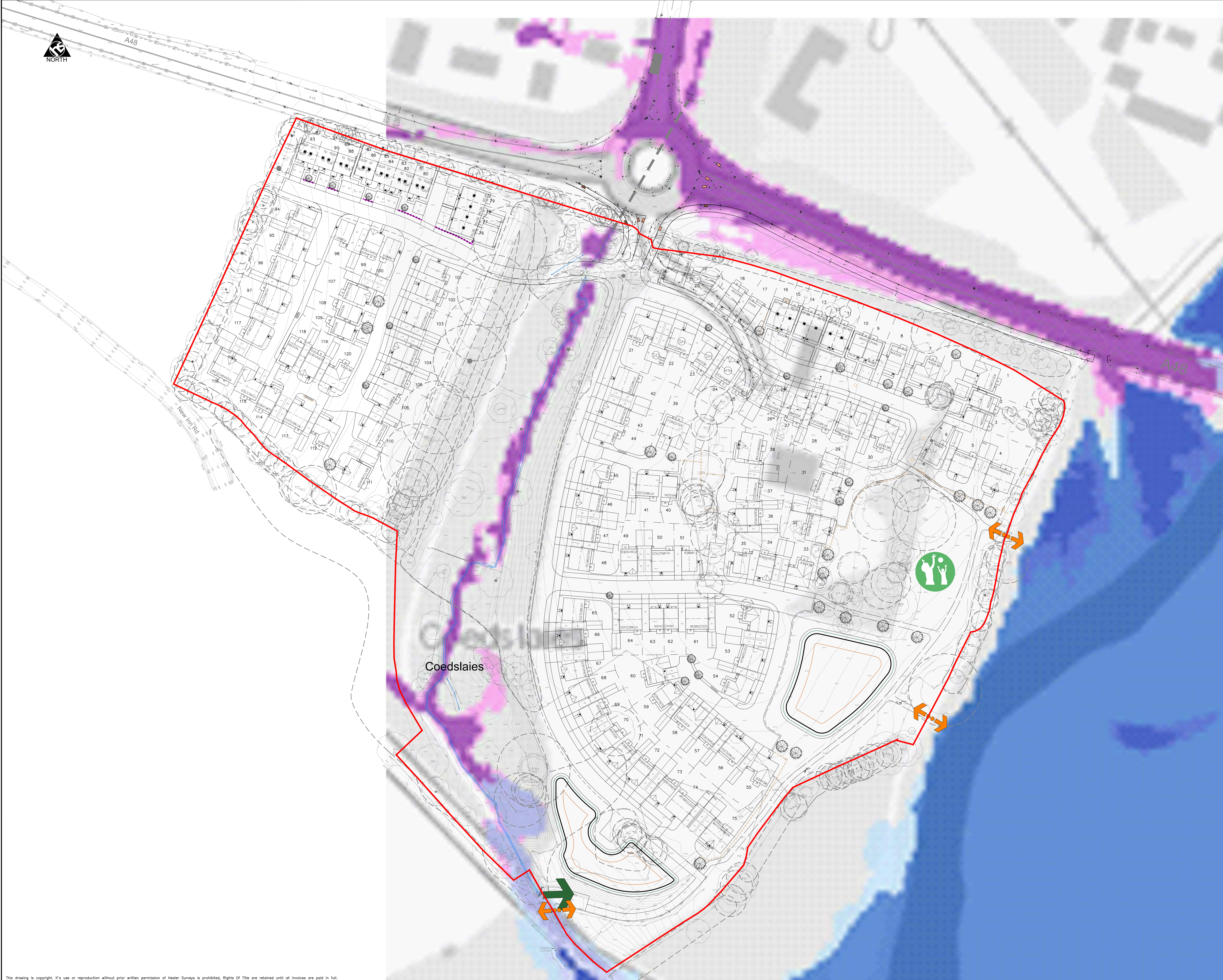


CRAIG Y PARC, BRIDGEND – CONSTRAINTS AND OPPORTUNITIES



APPENDIX F

Flood Zone Overlay & NRW Flood Maps



NOTES

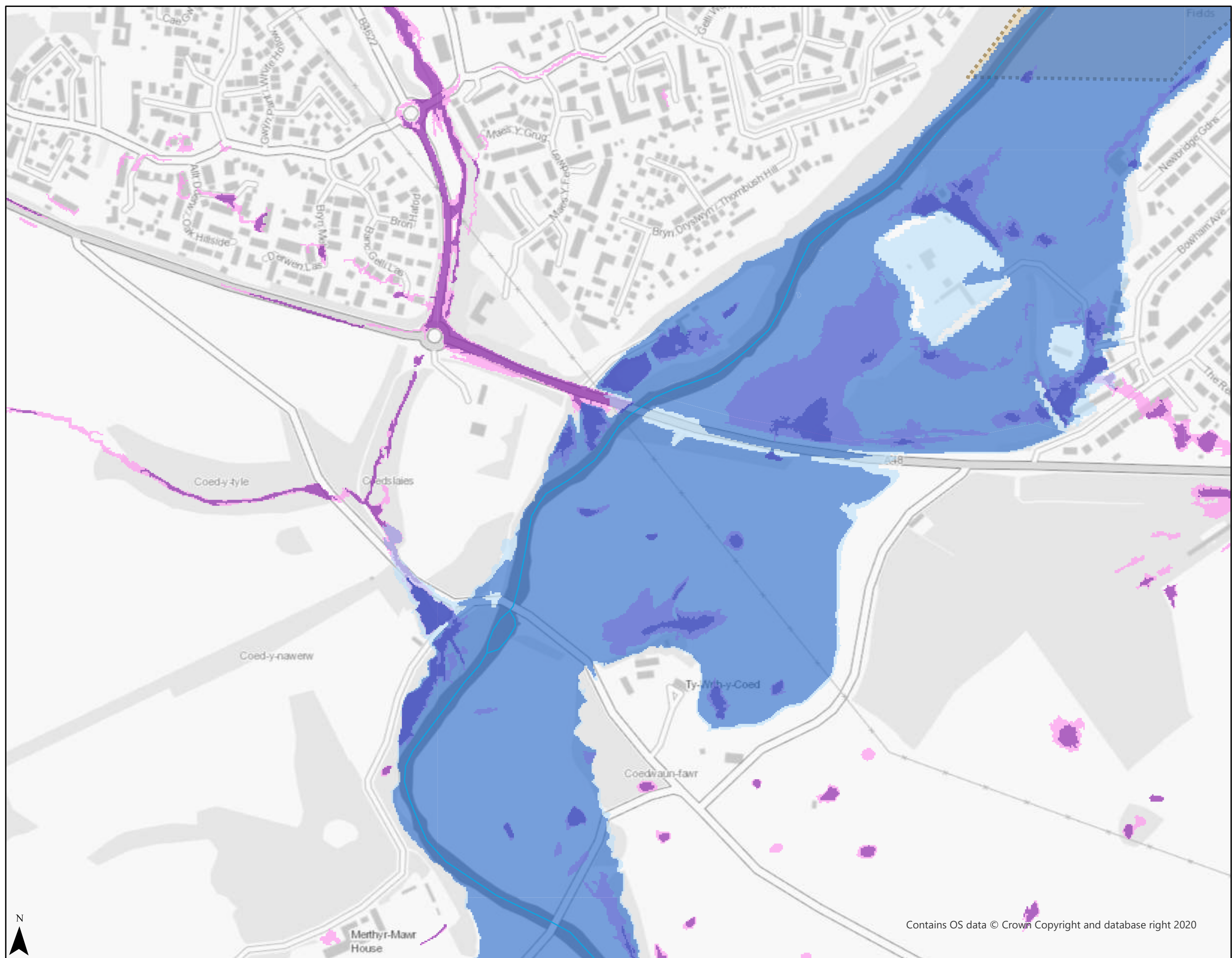
- ☒ Rivers and Sea
- ☐ Flood Zone 3
- ☐ Flood Zone 2
- ☒ Surface Water and Small Watercourses
- ☐ Flood Zone 3
- ☐ Flood Zone 2

REV	BY	CHK	DESCRIPTION	DATE
healersurveys				
8 Oldfield Road, Bocum Park, Perth, CF35 5LJ Tel: 01556 865566 Fax: 01556 865577 Email: mail@healersurveys.co.uk Web site: www.healersurveys.co.uk				
STATUS:				
CLIENT: Bellway Homes				
DEVELOPMENT: Proposed Residential Development at Craig Y Parcau, Bridgend				
TITLE: Flood Zone Overlay NRW Flood Map for Planning				
SCALE (B): 1:500				
DATE: October 2025	DRAWN: TM	CHKD BY: CW	SIZE: A0	
DRAWING NUMBER: 3954-SK003	REVISION: ~			

Flood Map for Planning - Detail
Craig Y Parcau, Bridgend

Legend

- Flood Defence Locations
- TAN15 Defended Zones
- Rivers
- Sea
- Rivers and Sea
- Rivers
 - Flood Zone 3
 - Flood Zone 2
- Sea
 - Flood Zone 3
 - Flood Zone 2
- Surface Water and Small Watercourses
 - Flood Zone 3
 - Flood Zone 2
- Recorded Flood Extents
- Shoreline Management Plan policies
- Flood Risk from Reservoirs
- Main Rivers



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Scale at A3: 1:5,000

Date: 28/08/2025

Disclaimer

<https://naturalresources.wales/flooding/disclaimer-for-our-flood-and-coastal-erosion-risk-maps/?lang=en>

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0.2 0.1 0 0.2
km

British National Grid

APPENDIX G

Greenfield Runoff & Quick store estimations

From: Gethin Powell <Gethin.Powell@bridgend.gov.uk>
Sent: 06 October 2025 10:54
To: chris.rhys.williams
Subject: RE: Greenfield Runoff Rate - Craig Y Parcau, Bridgend

Hi Chris,

Yes QBar is acceptable.

Happy to have some discussions/informal agreement prior to a pre-app submission.

Regards,

Gethin

Gethin Powell

Arweinydd Tîm Rheoli Arfordiroedd a Llifogydd | Team Leader Coastal & Flood Management

Y Gyfarwyddiaeth Cymunedau | Communities Directorate

Cyngor Bwrdeistref Sirol Pen-y-bont ar Ogwr | Bridgend County Borough Council

Ffôn/Phone: (01656) 642 810

Ebost/Email: Gethin.Powell@bridgend.gov.uk

Gwefan/ website: www.bridgend.gov.uk

From: chris.rhys.williams <chris.rhys.williams@healersurveys.co.uk>

Sent: 06 October 2025 10:37

To: Gethin Powell <Gethin.Powell@bridgend.gov.uk>

Subject: FW: Greenfield Runoff Rate - Craig Y Parcau, Bridgend

Importance: High

Rhybudd: E-bost allanol yw hwn - sy wedi dod o sefydliad/unigolyn y tu allan i'r Cyngor. Byddwch yn wylidwrs wrth glicio ar ddolenni neu agor atodiadau.

Caution: This is an external email and did not originate from within the Council. Please take care when clicking links or opening attachments.

Hi Gethin,

Prior to today's meeting, have you had chance to review the email below and attached Qbar estimation?

We also wanted to discuss things like Bridgend's approach to interception ratios, use of swales/features etc prior to making a Pre-SAB application, to try and refine the design to Bridgend's requirements making any comments received more refined.

Is this something we can do, or would you advise making the Pre-SAB application as a first point of reference without LA input?

Thanks,
Chris

Senior Infrastructure Engineer

Healer Surveys Limited

8 Old Field Road, Bocam Park, Pencoed,
Bridgend, South Wales. CF35 5LJ

Tel:- 01656 865566

Email:- chris.rhys.williams@healersurveys.co.uk

Website:- Healer Surveys South Wales

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From: chris.rhys.williams

Sent: 22 September 2025 14:53

To: SAB <sab@bridgend.gov.uk>

Cc: Ruilin.Jiao@bridgend.gov.uk; Biodiversity <biodiversity@bridgend.gov.uk>; thomas.morris <thomas.morris@healersurveys.co.uk>

Subject: FW: Greenfield Runoff Rate - Craig Y Parcau, Bridgend

Importance: High

Hi,

Has there been any progress on our query below sent on Friday 12th September?

Regards,

Chris Williams
Senior Infrastructure Engineer

Healer Surveys Limited

8 Old Field Road, Bocam Park, Pencoed,
Bridgend, South Wales. CF35 5LJ

Tel:- 01656 865566

Email:- chris.rhys.williams@healersurveys.co.uk

Website:- Healer Surveys South Wales

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From: chris.rhys.williams
Sent: 12 September 2025 15:23
To: 'SAB' <SAB@bridgend.gov.uk>
Cc: thomas.morris <thomas.morris@healersurveys.co.uk>; Biodiversity <Biodiversity@bridgend.gov.uk>
Subject: RE: Greenfield Runoff Rate - Craig Y Parcau, Bridgend
Importance: High

Hi Gethin,

Thank you for the response below. We've discussed the response with the client and have been asked to discuss the issue a little further.

The original LDP document statement was made by Environment Agency Wales, now replaced by NRW. If NRW were to still have the same stance would SAB still object and require the controlled rate?

Is there any documentation within the LDP application information that contradicts the statement and forms the basis for SAB requiring the controlled discharge rate?

As we are currently in the process of producing the FCA, should the discharge rate be required, could you confirm if the attached Greenfield Runoff estimation for Qbar (22.2l/s) is acceptable?

The client has also asked if there is a Commuted Sum calculator available from Bridgend SAB?

I would be happy to discuss the above in a telephone conversation should you wish to give me a call on the contact details below.

Kind regards,

Chris Williams
Senior Infrastructure Engineer

Healer Surveys Limited

8 Old Field Road, Bocam Park, Pencoed,
Bridgend, South Wales. CF35 5LJ

Tel:- 01656 865566
Email:- chris.rhys.williams@healersurveys.co.uk
Website:- Healer Surveys South Wales

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From: SAB <SAB@bridgend.gov.uk>
Sent: 08 September 2025 15:11
To: chris.rhys.williams <chris.rhys.williams@healersurveys.co.uk>

Cc: thomas.morris <thomas.morris@healersurveys.co.uk>; Biodiversity <Biodiversity@bridgend.gov.uk>

Subject: RE: Greenfield Runoff Rate - Craig Y Parcau, Bridgend

Hi Chris,

Apologies for the delay responding.

That statement is incorrect. Flows rates will need to be discharged at a restricted rate.

Regards,

Gethin

Gethin Powell

Arweinydd Tîm Rheoli Arfordiroedd a Llifogydd | Team Leader Coastal & Flood Management

Y Gyfarwyddiaeth Cymunedau | Communities Directorate

Cyngor Bwrdeistref Sirol Pen-y-bont ar Ogwr | Bridgend County Borough Council

Ffôn/Phone: (01656) 642 810

Ebost/Email: Gethin.Powell@bridgend.gov.uk

Gwefan/ website: www.bridgend.gov.uk

From: chris.rhys.williams <chris.rhys.williams@healersurveys.co.uk>

Sent: 05 September 2025 16:10

To: Biodiversity <Biodiversity@bridgend.gov.uk>

Cc: landdrainage <landdrainage@bridgend.gov.uk>; Gethin Powell <Gethin.Powell@bridgend.gov.uk>; thomas.morris <thomas.morris@healersurveys.co.uk>; Ruilin Jiao <Ruilin.Jiao@bridgend.gov.uk>; SAB <SAB@bridgend.gov.uk>

Subject: FW: Greenfield Runoff Rate - Craig Y Parcau, Bridgend

Importance: High

Rhybudd: E-bost allanol yw hwn - sy wedi dod o sefydliad/unigolyn y tu allan i'r Cyngor. Byddwch yn wylidwrs wrth glicio ar ddolenni neu agor atodiadau.

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Good afternoon,

We've been trying to get in contact with Bridgend in reference to the attached emails for SAB and Greenfield runoff rates for the proposed development at Craig Y Parcau.

We have reviewed the attached Drainage Strategy which was produced on 29th April 2020 by Consulting Civil Engineer WL Squared for the client HD Ltd.

Within the attached document there is a section named 'CURRENT HYDROLOGICAL REGIME', and it is stated:

"The stream that runs through the site, it is believed to be the main means of stormwater discharge from the site given the site topography. The detailed flood risk maps maintained by Natural Resources Wales (excerpt opposite left bottom) show the area of stream running through the site to be an area of low surface water flood risk (shown in yellow). Environment Agency Wales have previously advised HD Ltd through their consultants Opus that the permitted (stormwater) discharge rate to the River Ogwr depended upon where on the River the development surface water was discharged. If the discharge to the River Ogwr was north of the A48 crossing then a maximum discharge rate of 28.2l/s/ha would be permitted. If however the discharge was south of the A48 then there would be no restriction of

discharge rate imposed by them provided SUDS features were incorporated within the proposed drainage scheme.”



As this document was included within the Bridgend LDP under Supporting Evidence for Proposed Allocation COM1(1) – Craig Y Parcau document SD183 Drainage Strategy, can you confirm that should we provide a positive outfall for the Surface water to the river Ogwr this would be acceptable at free discharge as per the approved document attached as the development is South of the A48?

Kind Regards,

Chris Williams
Senior Infrastructure Engineer

Healer Surveys Limited

8 Old Field Road, Bocam Park, Pencoed,
Bridgend, South Wales. CF35 5LJ

Tel:- 01656 865566

Email:- chris.rhys.williams@healersurveys.co.uk

Website:- Healer Surveys South Wales



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From: chris.rhys.williams
Sent: 27 August 2025 11:11
To: biodiversity@bridgend.gov.uk
Cc: thomas.morris <thomas.morris@healersurveys.co.uk>
Subject: Greenfield Runoff Rate - Craig Y Parcau, Bridgend
Importance: High

Hi,

We're in the process of working for a developer within Bridgend CBC and have a query in relation to the greenfield runoff rate for a proposed site.

The site in question is yet to have an FRA (one is being commissioned) and therefore no greenfield runoff rate has been agreed to date.

Could you confirm if the attached Greenfield Runoff estimation is correct, which would result in a QBar of 22.2l/s for the development?

Kind Regards,

Chris Williams
Senior Infrastructure Engineer

Healer Surveys Limited

8 Old Field Road, Bocam Park, Pencoed,
Bridgend, South Wales. CF35 5LJ

Tel:- 01656 865566
Email:- chris.rhys.williams@healersurveys.co.uk
Website:- Healer Surveys South Wales



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Search



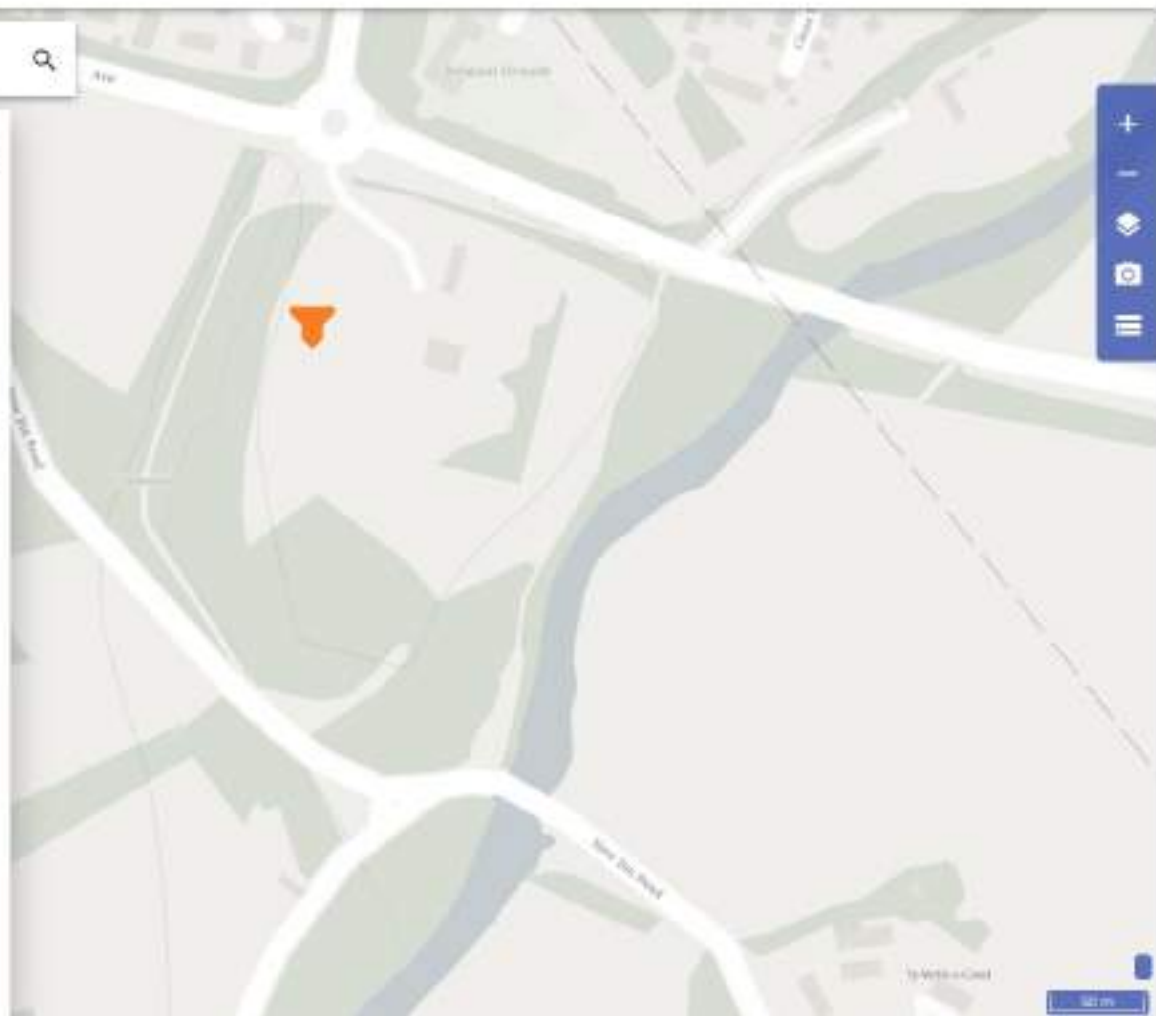
Point data at 288984,178632 ✎



Point: 288984,178632 📍

Rainfall Export

Description	Value
NGR	55-86984 78632
BFIHOST	0.754
BFIHOST19	0.768
P00PWET	0.52
SAARE190	1117 mm



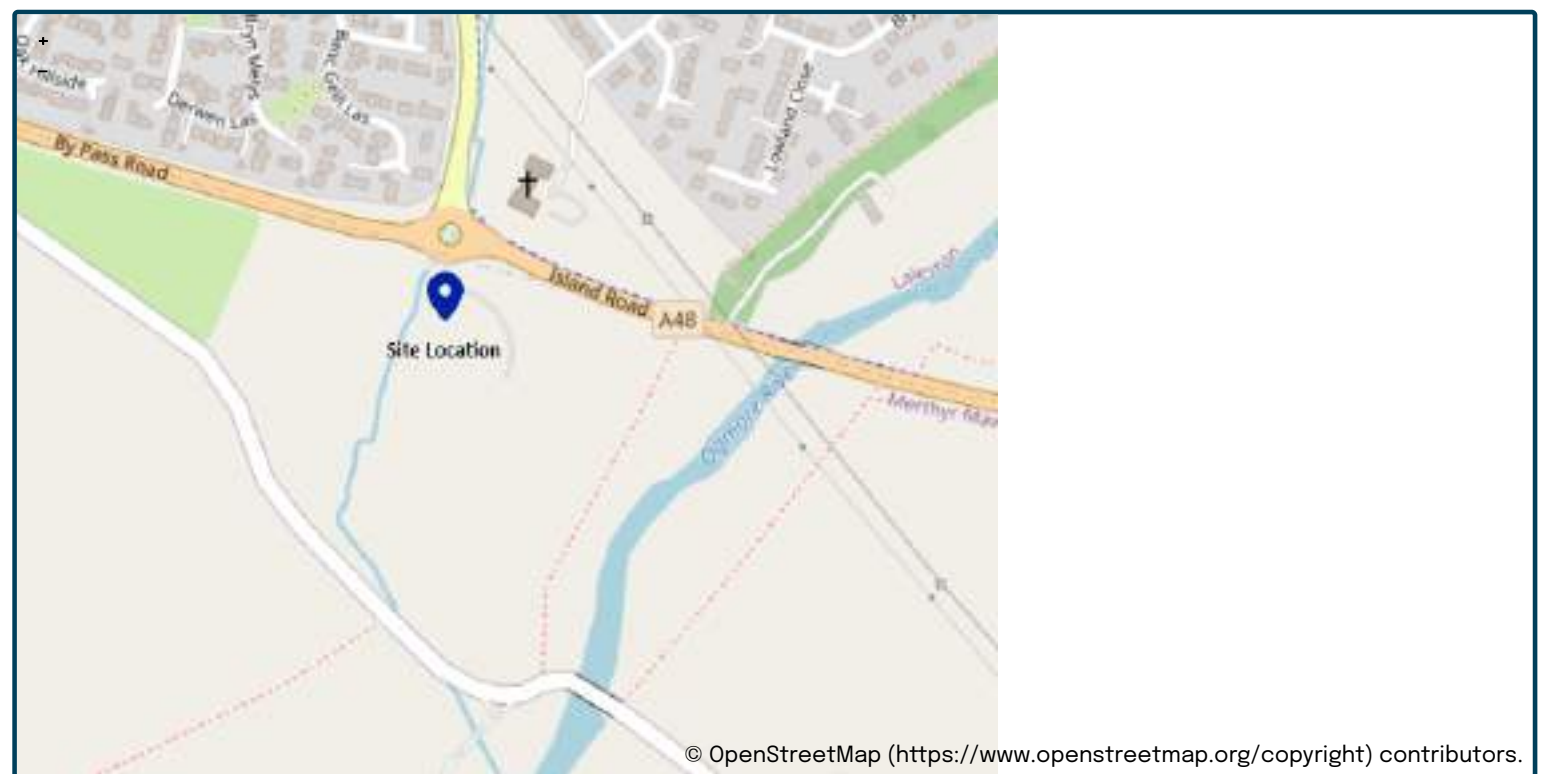
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	22/08/2025
Calculated by	Healer Surveys
Reference	3954
Model version	2.1.2

Location

Site name	Craig Y Parcau
Site location	Bridgend



Site easting (British National Grid)	288988
Site northing (British National Grid)	178666

Site details

Total site area (ha)	6.9	ha
----------------------	----------------------------------	----

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MORE INFO

Greenfield runoff

Method

Method	FEH statistical
--------	-----------------

FEH statistical

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	1117	mm	1117
BFIHOST	0.754		
QMed-QBar conversion	1.075		1.075
QMed (l/s)	20.63	l/s	
QBar (FEH statistical) (l/s)	22.18	l/s	

Growth curve factors

	<u>My value</u>		<u>Map value</u>
Hydrological region	9		9
1 year growth factor	0.88		
2 year growth factor	0.93		
10 year growth factor	1.42		
30 year growth factor	1.78		
100 year growth factor	2.18		
200 year growth factor	2.46		

Results

Method	FEH statistical	
Flow rate 1 year (l/s)	19.5	l/s
Flow rate 2 year (l/s)	20.6	l/s
Flow rate 10 years (l/s)	31.5	l/s
Flow rate 30 years (l/s)	39.5	l/s
Flow rate 100 years (l/s)	48.3	l/s
Flow rate 200 years (l/s)	54.6	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.1.2) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of the data in the design or operational characteristics of any drainage scheme.

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 Quick Storage Estimate



Variables

Results

Design

Overview 2D

Overview 3D

Vt

Results

Global Variables require approximate storage of between 1580 m³ and 2191 m³.

These values are estimates only and should not be used for design purposes.

Analyse

OK

Cancel

Help

Enter Climate Change between -100 and 600

 Quick Storage Estimate



Variables

Results

Design

Overview 2D

Overview 3D

Vt

Variables

FEH Rainfall 

Return Period (years)

Version  

Site

Cv (Summer)

Cv (Winter)

Impermeable Area (ha)

Maximum Allowable Discharge (l/s)

Infiltration Coefficient (m/hr)



Safety Factor

Climate Change (%)

Analyse

OK

Cancel

Help

Enter Climate Change between -100 and 600

APPENDIX H

Tier 2 Geotechnical and Geoenvironmental Assessment by Terra Firma



Tier 2 Geotechnical and Geoenvironmental Assessment

Site: Craig-y-Parcau, Bridgend

Prepared For: Bellway Homes

Issue Date: December 2024

Job No: TF-24-589-CA

REPORT TITLE : **Geoenvironmental and Geotechnical Report:
Proposed Residential Development, Craig-y-Parcau, Bridgend**

JOB NUMBER : **TF-24-589-CA**

ISSUE DATE : **December 2024**

REPORT REFERENCE : **TF-24-589-T2-01**

Document Revision Record

Issue No.	Date	Revision Details	Initials
1	01/12/2024		ML

	Name	Signature
Prepared	David Emanuel BSc (Hons), MSc, FGS, Dip.Chem, M Phil, CGeol Associate Director	
Checked	Mathew Lake MEng, FGS Director	
Approved	Gwyn Lake BSc (Hons). PhD, CGeol, FGS Managing Director	



Executive Summary

Site Location and Proposed Development	<i>Bellway Homes (the Client) is proposing the construction of a new residential development at Craig-y-Parcau, Bridgend.</i> <i>The development site is irregular in shape and locates within Merthyr Mawr, Bridgend. The site centres on an approximate National Grid Reference of 288980, 178610, occupying a plan area of approximately 6.91 Hectares.</i>																		
Geology	<i>The Geological map shows the site to be underlain by the Blue Lias Formation (western parcel of site) and the Porthkerry Formation. No superficial deposits are shown overlying the solid geology.</i>																		
Ground Conditions	<table border="1"> <thead> <tr> <th colspan="3">Depth (m)</th><th>Thickness (m)</th><th>Stratum</th></tr> </thead> <tbody> <tr> <td>0.00</td><td>-</td><td>0.4/0.8</td><td>0.4/0.8</td><td>Made Ground: slightly sandy gravelly CLAY with occasional brick concrete and timber fragments. (TP01-TP03 +TP07 only)</td></tr> <tr> <td>0.4/0.8</td><td>-</td><td>1.4/2.6</td><td>1.0/1.8</td><td>Weathered Blue Lias/Porthkerry Formation - Firm yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content</td></tr> </tbody> </table>				Depth (m)			Thickness (m)	Stratum	0.00	-	0.4/0.8	0.4/0.8	Made Ground: slightly sandy gravelly CLAY with occasional brick concrete and timber fragments. (TP01-TP03 +TP07 only)	0.4/0.8	-	1.4/2.6	1.0/1.8	Weathered Blue Lias/Porthkerry Formation - Firm yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content
Depth (m)			Thickness (m)	Stratum															
0.00	-	0.4/0.8	0.4/0.8	Made Ground: slightly sandy gravelly CLAY with occasional brick concrete and timber fragments. (TP01-TP03 +TP07 only)															
0.4/0.8	-	1.4/2.6	1.0/1.8	Weathered Blue Lias/Porthkerry Formation - Firm yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content															
Contamination of Concern	<i>Contaminants of concern identified in made ground soils during the investigation are lead, non volatile PAH and chrysotile asbestos.</i>																		
Conclusion of Tier 2 Assessment	<i>Made Ground located around the former Craig-y-Parcau buildings was found to contain a number of contaminants that were above generic assessment criteria for a residential setting. In addition, Chrysotile asbestos fibre clumps were recorded in 1 sample of made ground. A Stockpile of excavated soil located in the compound of Craig-y-Parcau was also found to contain elevated levels of PAH.</i> <i>Given the recorded concentration of contamination and limited access to parts of the site, it is recommended that a Tier 3 Assessment is completed before moving onto a Stage 2 Options Appraisal and Remediation Strategy. The objectives of the Tier 3 assessment is to:</i> <i>Investigate the extent of made ground and contamination within the made ground</i> <i>Derive site specific assessment criteria</i> <i>Assess the risk posed by the made ground and update the conceptual site model</i>																		
Foundation Solution	<i>The presence of soluble limestone bedrock on the western part of the site provides a geotechnical risk and will require a specific foundation solution to mitigate the risk posed from dissolution. As such, the site has been split into two foundation zones. The western zone will require raft/semi raft foundations capable of spanning a 3m soft spot. Strip foundations are suitable for the remaining site.</i>																		
Recommended Further Works	<i>In order to refine the site conceptual model, it is recommended that additional investigation is undertaken around the area of the former buildings on site and areas currently inaccessible during this phase of investigation works. Samples of made ground should be collected and assessed to fully quantify the risk posed by the identified contaminants.</i>																		

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Drawings

Drawing 01 Proposed Site Layout

SECTION 1 Introduction & Proposed Development

1.1 Background

Bellway Homes (the Client) is proposing the construction of a new residential development at Craig-y-Parcau, Bridgend. The proposed site layout can be seen **Figure 1.1**.



Figure 1.1 Proposed Site Layout

Terra Firma have been commissioned by the Client to undertake a Geotechnical and Geoenvironmental Report.

This report contains a Tier 2 assessment (Site Investigation) including a Generic Quantitative Geoenvironmental Risk Assessment and Geotechnical Ground Investigation.

1.2 Objectives

Land Contamination Risk Management (LCRM) guidance provided by the Environment Agency advocates using a tiered approach. This comprises Tier 1; the Preliminary Risk Assessment, Tier 2; the Generic Quantitative Risk Assessment and Tier 3; the Detailed Quantitative Risk Assessment. As each tier is completed a decision is made whether it is necessary to advance to the next tier.

In addition to LCRM, geotechnical aspects of the development also need to be considered and are approached in a similar manner, with the risks identified in the preliminary assessment, and then investigated through subsequent phase of investigation.

1.2.1 Tier 2

The main objectives of the Tier 2 Generic Quantitative Geoenvironmental Risk Assessment programme are:

- investigate the potential human health and environmental liabilities at the site associated with any contamination; and
- provide a summary of the human health and environmental conditions at the site, together with any necessary further intrusive works and / or remediation works to render the site fit for its intended use.

The main objectives of the Geotechnical Site Investigation are:

- investigate the type, strength and bearing characteristics of the shallow superficial and underlying solid geology;
- provide engineering foundation and floor slab recommendations for the proposed development;
- provide infiltration rates and stormwater drainage viability; and
- provide recommendations regarding any other geotechnical aspects pertaining to the development.

In order to achieve the above objectives, Terra Firma carried out an assessment programme including a review of existing data, followed by a field investigation to collect geotechnical and geoenvironmental data from selected locations.

1.3 Geotechnical Category

In accordance with BS EN 1997-1:2004+A1:2013, the proposed development comprises the following geotechnical category:

Geotechnical Category 2: conventional types of structures and foundation with no exceptional risk of difficult soil or loading conditions (e.g., spread, raft & pile foundations; retaining structures; excavations; earthworks and ground anchors).

1.4 Information Sources

The following sources of information have been referenced in support of this assessment:

- Tier 1 Assessment Report Reference T1-24-589-1.

1.5 Roles & Responsibilities

Table 1.1 Roles and Responsibilities

Role	Organisation
Client/Developer	Bellway Homes
Geotechnical/Geoenvironmental Consultant	Terra Firma
Local Authority	Bridgend County Borough Council

1.6 Limitations & Exceptions of Investigation

The Client has requested that a Tier 2 Geoenvironmental and Geotechnical Report (GGR) be undertaken to enable the outlined main objectives.

The GGR was conducted, and this report has been prepared for the sole internal reliance of the Client and their design and construction team. This report shall not be relied upon or transferred to any other parties without the express written authorisation of TFW Group Ltd. If an unauthorised third party comes into possession of this report, they rely on it at their peril and the authors owe them no duty of care and skill. The report represents the findings and opinions of experienced geoenvironmental and geotechnical consultants. TFW Group Ltd does not provide legal advice and the advice of lawyers may be required.

The subsurface geological profiles, any contamination and other plots are generalised by necessity and have been based on the information found at the locations of the exploratory holes and depths sampled and tested.

Human health and environmental risk assessment outcomes may not take into account the potential for the creation of new contaminant linkages as a result of variation to the proposed development and recommended engineering solutions. It is therefore imperative that the Client engages a geoenvironmental consultant to re-visit the conceptual site model and potential risks upon completion of final designs, prior to development.

Whilst this report assesses the suitability of soils in respect to human health and the environment, it is beyond the scope of this report to determine the legal status of imported and re-used soils/aggregates. It is the responsibility of the Client to confirm imported and re-used soils/aggregates have reached 'Non-Waste' status.

The investigation was limited by the following site constraints:

- Access restrictions to the required locations due to Himalayan Balsam and above ground utilities.

1.7 Quality Assurance

The quality, health, safety and environmental aspects of the assessment comply with Terra Firma business management system which is UKAS accredited and complies with the requirements of BS EN ISO 9001:2015, BS EN ISO 14001:2015 and BS EN ISO 45001:2018 standards.

SECTION 2 Summary of Tier 1 Assessment

The site has been the subject of a previous Tier1 Geoenvironmental Desk Study:

- *Tier 1 Geoenvironmental and Geotechnical Report: Proposed Residential Development at Craig-y-Parcau, Bridgend dated November 2024.*

The salient points of the Tier 1 Assessment are summarised in **Section 2.1**.

2.1 Summary of Tier 1 Assessment

The findings of the Tier 1 Assessment are summarised in **Table 2.1**. The Tier 1 Assessment can be made available on request.

Table 2.1 Summary of Tier 1 Assessment

Site History	<i>The site was undeveloped until the 1890's when Carig y Parcau was built. Llanerch was later built on the southeastern part of the site in the early 1970's.</i>
Geology	<i>The Geological map shows the site to be underlain by the Blue Lias Formation (western parcel of site) and the Porthkerry Formation. No superficial deposits are shown overlying the solid geology.</i>
Radon	<i>Full radon protection measures are required for new development on site.</i>
Potential Sources of Contamination	<i>Several sources of contamination have been discovered during the desk study which require further investigation, namely demolition waste, former lime kilns and underlying geology</i>

SECTION 3 Field Investigation

3.1 Site Works

A geotechnical and geoenvironmental site investigation comprising the excavation of 31 trial pits was undertaken between the 6th and 8th November 2024.

The fieldwork was supervised by Terra Firma, who logged the exploratory holes to the requirements of BS 5930:2015+A1:2020. The proposed locations of the exploratory holes were determined by Terra Firma in general accordance with BS 10175:2011+A2:2017 in order to assess the findings of the preliminary conceptual site model.

Trial pits referenced TP01 to TP31, were formed using a JCB 3CX excavator with a 0.60m wide bucket.

Representative disturbed samples were taken and retained in airtight containers for environmental and geotechnical testing.

On completion, all trial pits were backfilled with materials arisings compacted in layers using the excavator bucket. The ground surface was left proud to accommodate future settlement of backfilled materials.

The trial pit logs are presented in **Annex A**.

Soakaway tests were carried out in trial pits TP23 and TP25-TP29 in general accordance with BRE DG 365:2016. The excavation sides were squared using the excavator bucket and dimensions recorded within the test section. The trial pit was partially filled with clean water using a dedicated bowser with a 75mm diameter outlet and the fall in level recorded against time. The results are presented in **Annex B**.

Exploratory hole locations are shown on **Drawing 01**.

3.2 Ground Conditions

The ground conditions encountered by the exploratory holes can in general be summarised as shown in **Table 3.1**.

Table 3.1 Summary of Typical Ground Conditions

Depth (m)			Thickness (m)	Stratum
0.00-	-	0.4/0.8	0.4/0.8	Made Ground: slightly sandy gravelly CLAY with occasional brick concrete and timber fragments. (TP01-TP03 +TP07 only)
0.4/0.8	-	>2.6	1.0/1.8	Weathered Blue Lias/Porthkerry Formation - Firm yellowish brown slightly sandy gravelly silty with low cobble and boulder content

3.3 Groundwater

Groundwater was not encountered in the exploratory holes.

3.4 Stability & Obstructions

Trial pits remained stable and vertical during excavation.

A concrete obstruction was encountered at 0.8m depth in trial pit TP07.

All trial pits terminated on possible bedrock ranging between 1.4m and 2.6m depth.

3.5 Laboratory Chemical Testing

3.5.1 Sampling Strategy

Soil sampling locations were selected on a targeted basis to investigate suspected sources of contamination or potential contamination migration pathways.

Soil sampling locations were also selected on a non-targeted basis to characterise the contamination status of the remaining site.

Sample locations, depths and suspected/known contamination source targets are summarised in **Table 3.2**:

Table 3.2 Sample Locations and Targets

Location	Depth (m)	Contamination Targets
TP01	0.2-0.3	Made Ground
TP02	0.5-0.6	Made Ground
TP03	0.2-0.3	Made Ground
TP04	0.5-0.6	Natural strata
TP05	1-1.1	Natural strata
TP06	0.6	Natural strata
TP07	0.1	Made Ground
TP07	0.4	Made Ground
TP08	0.1	Made Ground
TP08	0.8	Natural strata
TP09	0.05	Natural strata
TP10	1.5	Natural strata
TP11	0.7	Natural strata
TP12	1	Natural strata
TP13	0.1	Natural strata
TP14	0.1	Natural strata
TP15	0.6	Natural strata
TP16	0.4	Natural strata
TP17	0.1	Natural strata
TP18	1.5	Natural strata
TP19	0.5	Natural strata
TP20	0.8	Natural strata
TP21	0.1	Natural strata
TP22	0.4	Natural strata
TP23	0.5	Natural strata
TP24	0.9	Natural strata
TP25	0.6	Natural strata
TP28	0.05	Natural strata
SP1	0.1	Stockpile
SP2	0.1	Stockpile

3.5.2 Sample Analysis

During the site investigation works soil samples were collected and despatched under a chain of custody to the accredited laboratories of Eurofins Chemtest for chemical analysis.

The laboratory test results certificates may be found in **Annex C**.

3.6 Soil Property Testing

3.6.1 In-situ Permeability Testing

Soakaway test results are summarised in **Table 3.3**.

Table 3.3 Summary of Soakaway Results

Trial Pit	Depth Range of Test (m)	Geology Description	Infiltration Rate (ms ⁻¹)
TP23	0.4-1.15	Slightly sandy gravelly silty CLAY with low cobble and boulder content	1.82 x10 ⁻⁰⁵
TP25	1-1.5		No infiltration
TP26	0.5-1.0		6.53x10 ⁻⁰⁵
TP27	0.5-1.2		No infiltration
TP28	0.7-1.2		2.21x10 ⁻⁰⁵
TP29	1.1-1.6		No infiltration

The test results and calculation sheets may be found in **Annex B**.

3.6.2 In-situ California Bearing Ratio (CBR) Testing

In-situ California Bearing Ratio (CBR) test results are summarised in **Table 3.4**.

Table 3.4 Summary of CBR Testing

Location	CBR Value Summary
TRL01	Initially less than 2% increasing to 5-6% beyond 0.4m
TRL02	Initially less than 2% increasing to 5-7% beyond 0.4m
TRL03	Initially less than 3% increasing to 5-7% beyond 0.3m
TRL04	Initially less than 3% increasing to 5-12% beyond 0.3m
TRL05	Initially less than 2% increasing to 6% beyond 0.3m
TRL06	Initially less than 2% increasing to 5-7% beyond 0.3m
TRL07	Initially less than 2% increasing to 5-7% beyond 0.3m
TRL08	Initially less than 2% increasing to 5-7% beyond 0.2m
TRL09	Initially less than 2% increasing to 7% beyond 0.3m
TRL10	Initially less than 2% increasing to 10% beyond 0.2m
TRL11	Initially less than 2% increasing to 7% beyond 0.3m

Equivalent CBR values have been calculated and presented with the results in **Annex D**.

3.6.3 Laboratory Geotechnical Testing

A schedule of laboratory tests was prepared by Terra Firma and samples were despatched to the accredited laboratories of Apex Testing Solutions. A summary of the testing carried out is presented in **Table 3.5**.

Table 3.5 Summary of Geotechnical Testing

Geotechnical Test	No. Samples Tested
Moisture Content	15
4 Point Liquid and Plastic Limit	15
BRE SD1 (Concrete classification)	10

The geotechnical test results are presented in **Annex E**.

SECTION 4 Evaluation of Geoenvironmental Analytical Results

4.1 Assessment Methodology

4.1.1 Soils

An assessment of the analytical results has been made with comparison with the following generic assessment criteria with preference in most onerous order:

- Land Quality Management (LQM) and the Chartered Institute of Environmental Health (CIEH) Suitable 4 Use Levels (S4UL) (Nathanail, CP *et al.*:2015);
- Category 4 Screening Levels (C4SL) provided by the Department for Environment, Food and Rural Affairs (DEFRA:2014);
- Soil Guideline Values (SGV) by the Environment Agency (2009);
- Generic Assessment Criteria (GAC) provided by EIC/AGS/CL:AIRE (2010); and

In the absence of generic assessment criteria, the laboratory limit of detection has been used for comparison, in order to establish the presence/absence of determinands and for initial screening purposes.

An average soil organic matter (SOM) of 0.79% was determined from laboratory analysis, therefore a conservative value of 1% SOM has been adopted for the site when assessing appropriate threshold values for analysed determinands.

4.2 Soil Test Results

A summary of the chemical test results which include the regulatory soil guideline values used in a **residential setting with plant uptake** are given in the following tables. The complete results can be found in **Annex D**.

4.2.1 Inorganics

Thirty samples were tested for a standard suite of inorganics, pH and organic matter. The summarised results are in **Table 4.1**.

Table 4.1 Summary of Soil Chemical Test Results – Inorganics

Determinant	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Arsenic	37	LQM/CIEH	3	32	0
Cadmium	11	LQM/CIEH	0.1	5.7	0
Chromium III	910	LQM/CIEH	8.2	37	0
Chromium VI	6	LQM/CIEH	<0.50	<0.50	0
Copper	2400	LQM/CIEH	5.5	53	0
Lead	200	C4SL	15	550	2
Mercury (inorganic)	40	LQM/CIEH	<0.05	0.16	0
Nickel	180	LQM/CIEH	5.1	64	0
Selenium	250	LQM/CIEH	0.39	8.8	0
Zinc	3700	LQM/CIEH	21	640	0
Cyanide	-	-	<0.50	<0.50	-
Boron	290	LQM/CIEH	<0.4	1.2	0

Organic Matter (%)	-	-	0.2	4.6	-
pH	-	-	6.5	9.3	-
Notes: - No available guideline					

4.2.2 Organics

Thirty samples were tested for speciated polycyclic aromatic hydrocarbons (PAH). The summarised results are in **Table 4.2**.

Table 4.2 Summary of Soil Chemical Test Results – Speciated PAH

Determinant	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Naphthalene	2.3	LQM/CIEH	<0.10	0.24	0
Acenaphthylene	170	LQM/CIEH	<0.10	0.33	0
Acenaphthene	210	LQM/CIEH	<0.10	0.51	0
Fluorene	170	LQM/CIEH	<0.10	0.65	0
Phenanthrene	95	LQM/CIEH	<0.10	4.0	0
Anthracene	2400	LQM/CIEH	<0.10	1.8	0
Fluoranthene	280	LQM/CIEH	<0.10	10	0
Pyrene	620	LQM/CIEH	<0.10	7.5	0
Benzo(a)anthracene	7.2	LQM/CIEH	<0.10	8.9	1
Chrysene	15	LQM/CIEH	<0.10	9.7	0
Benzo(b)fluoranthene	2.6	LQM/CIEH	<0.10	15	1
Benzo(k)fluoranthene	77	LQM/CIEH	<0.10	4.6	0
Benzo(a)pyrene	2.2	LQM/CIEH	<0.10	12	1
Indeno(123cd)pyrene	27	LQM/CIEH	<0.10	8.2	0
Dibenzo(ah)anthracene	0.24	LQM/CIEH	<0.10	2.1	1
Benzo(ghi)perylene	320	LQM/CIEH	<0.10	6.7	0
Total PAH	-	-	<2.0	92	-
Notes: Thresholds based on 1.0% soil organic matter - No available guidelines					

Thirty samples were tested for petroleum hydrocarbon. The summarised results are shown in **Table 4.3**.

Table 4.3 Summary of Soil Chemical Test Results – Petroleum Hydrocarbons

Determinand	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Aliphatic					
PH C5 – C6 Ali	42	LQM/CIEH	<0.5	<1.0	0
PH C6 – C8 Ali	100	LQM/CIEH	<0.1	<1.0	0
PH C8 – C10 Ali	27	LQM/CIEH	<0.05	0.17	0
PH C10 – C12 Ali	130	LQM/CIEH	<2.0	<2.0	0
PH C12 – C16 Ali	1100	LQM/CIEH	<1.0	42	0
PH C16 – C21 Ali	65000*	LQM/CIEH	<2.0	69	0

PH C21 – C35 Ali	65000*	LQM/CIEH	<3.0	91	0
PH C35 – C44 Ali	65000	LQM/CIEH	<10	150	0
Aromatic					
PH C5 – C7 Arom	70	LQM/CIEH	<0.05	<0.05	0
PH C7 – C8 Arom	130	LQM/CIEH	<0.05	<0.05	0
PH C8 – C10 Arom	34	LQM/CIEH	<0.05	<0.05	0
PH C10 – C12 Arom	74	LQM/CIEH	<1.0	<1.0	0
PH C12 – C16 Arom	140	LQM/CIEH	<1.0	33	0
PH C16 – C21 Arom	260	LQM/CIEH	<2.0	14	0
PH C21 – C35 Arom	1100	LQM/CIEH	<2.0	50	0
PH C35 – C44 Arom	1100	LQM/CIEH	<1.0	46	0

Notes:

PH – Petroleum Hydrocarbon

Ali – Aliphatic

Arom – Aromatic

Thresholds based on 1.0% soil organic matter

* – Ali C16-21 and C21-C35 based on criteria for Ali EC >16-35

4.2.3 Asbestos Testing

All made ground soil samples were scheduled for asbestos screening. Asbestos was detected in 1no. samples. Samples testing positive for asbestos were further scheduled for gravimetric quantification of fibre quantification in soils. The results are summarised in **Table 4.4**.

Table 4.4 Summary of Soil Chemical Test Results – Asbestos Quantification

Sample	Depth (m)	Comment	Result (mass %)
TP07	0.4	Chrysotile fibres/clumps	0.001

SECTION 5 Generic Quantitative Risk Assessment

5.1 Contaminants of Concern

Contaminants of concern identified as part of the investigation are summarised in **Table 5.1**, along with an interpretation of the likely contamination source. Where applicable, the contaminant, source relationship is based on the inferences made in the preliminary conceptual site model.

Table 5.1 Contaminants of Concern

Location	Depth	Contaminant	Source
TP03	0.2-0.3	Lead	Made Ground
TP07	0.5		Made Ground
SP2	0.1	Benzo(a)anthracene	Made Ground - Stockpile
		Benzo(b)fluoranthene	
		Benzo(a)pyrene	
		Dibenzo(ah)anthracene	
TP07	0.4	Chrysotile asbestos	Made Ground

5.2 Contaminant Linkages

Based on the findings of the intrusive site investigation and identified contaminants, the preliminary conceptual site model has been revised. Remaining contaminant linkages are tabulated in the refined conceptual site model **Table 5.2**. Identified contaminant linkages may require further investigation, detailed risk assessment and appropriate mitigation or remedial measures.

Table 5.2 Refined Conceptual Site Model

Source	Pathway	Receptor
Made Ground associated with previous buildings	Direct soil and dust ingestion Dermal contact Inhalation Inhalation of asbestos fibres	Future site users Construction workers
Radon gas	Horizontal and vertical migration of ground gasses	Future site users

5.3 Conclusions of the Generic Quantitative Risk Assessment

Made Ground located around the former Craig-y-Parcau buildings was found to contain a number of contaminants that were found above generic assessment criteria for a residential setting. In addition, Chrysotile fibre clumps were recorded in one sample of made ground. A Stockpile of excavated soil located in the compound of Craig-y-Parcau was also found to contain elevated levels of PAH.

Given the recorded concentrations of contamination and limited access to parts of the site, it is recommended that a Tier 3 Assessment is completed before moving onto a Stage 2 Options Appraisal and Remediation Strategy. The objectives of the Tier 3 assessment is to:

- Investigate the extent of made ground and contamination within the made ground
- Investigate areas previously inaccessible or restricted
- Derive site specific assessment criteria
- Assess the risk posed by the made ground and update the conceptual site model

5.4 Likely Remediation Solution

The following sections outline the likely mitigation and remedial measures suitable for the identified contamination and proposed development. Detailed methodology to achieve the measures must be prescribed in a Remediation Strategy Report and the results presented in a Validation Report upon their completion.

5.4.1 Human Health

Given the low level of contamination in and around the former buildings, a cap and cover system is likely to be suitable for the affected areas of the site. This should be confirmed following the recommended Tier 3 assessment in line with LCRM.

All imported soils must be validated as clean and suitable for use in accordance with 'Requirements for the Chemical Testing of Imported Soils for Various End Uses and Validation Cover Systems'.

If during earthworks ground conditions are encountered that are markedly different to those found during the investigation, then the ground must be subject to additional sampling and testing and any necessary remedial measures designed and implemented before continuing with the works.

5.4.1.1 Radon

To mitigate against the risk to future site users from radon gas, full radon protection measures will be required in all structures. Reference should be made to guidance publication BR 211:2023 for further details on required protection elements. Specialist design, specification and verification of the installed protection measures is recommended.

Terra Firma offer a comprehensive in-house ground gas protection system design, specification and verification service.

Verification of installed ground gas protection systems by a competent, qualified, accredited, independent third party, will be required upon completion of the protection elements installation. Final verification will only be achieved if evidence gathering processes prescribed in the Verification Plan are fully undertaken.

SECTION 7 Laboratory Geotechnical Testing Results Analysis

Laboratory geotechnical testing results are summarised in the following sections and presented in their entirety in **Annex F**, unless otherwise stated.

7.1 Soil Testing

7.1.1 Plasticity & Moisture Content Testing

During the investigation fifteen samples of the shallow cohesive material was obtained and submitted for plasticity and moisture content testing. The test results are summarised in **Table 7.1**.

Table 7.1 Plasticity & Moisture Content Test Results

Location	Depth (m)	Geological Description	Moisture Content (%)	Plasticity Index (%)	Passing 425µm Sieve (%)	Modified Plasticity Index (%)	Volume Change Potential
TP01	0.60	Light brown slightly gravelly CLAY	34.2	38	98	37.24	Medium
TP03	0.90-1.0	Brown CLAY	31.5	46	100	31.5	Medium
TP04	1.4	Light brown slightly sandy slightly gravelly CLAY	22.8	30	95	28.5	Medium
TP05	1.0-1.10	Brownish grey slightly gravelly slightly sandy CLAY	20.0	26	92	23.92	Medium
TP08	0.80	Brown slightly gravelly CLAY	35.1	43	92	39.56	Medium
TP09	0.80	Brown slightly sandy CLAY	33.0	40	98	39.2	Medium
TP10	1.5	Light brown CLAY	32	44	100	44	High
TP11	1.10	Brown CLAY	37.8	35	98	34.3	Medium
TP13	0.10	Brown SILT	54.7	34	100	34	Medium
TP15	0.60	Orange brown slightly sandy CLAY	30.8	29	98	28.4	Medium
TP17	1.20	Brown CLAY	29.6	39	100	39	Medium
TP19	0.50	Brown slightly gravelly slightly sandy CLAY	23.4	19	88	16.72	Low

TP21	0.40	Brown Slightly sandy CLAY	32.2	44	100	44	High
TP23	0.5	Brown sandy gravelly CLAY	18.8	26	70	18.2	Low
TP28	0.60	Brown Slightly Sandy CLAY	28.8	28	100	28	Medium

In line with the NHBC:2024 (Chapter 4.2), the modified plasticity index for each sample was calculated.

For design purposes the shallow soils on site must be considered to have a high volume change potential.

7.1.2 Concrete Classification Testing

Ten samples were subject to testing for concrete classification in accordance with BRE SD1:2015. The results are summarised in **Table 7.2**

Table 7.2 BRE SD1 Testing Summary

Location	Depth (m)	2:1 Water/Soil Extract	Total Sulphur (%)	Acid Soluble Sulphate	Total Potential Sulphate (%)	Oxidisable Sulphides (%)	pH
		SO ₄ (mg/l)					
TP01	0.2-0.3	200	0.18	0.16	0.54	0.38	8.4
TP04	0.5-0.6	10	0.020	0.036	0.06	0.024	8.3
TP07	0.1	10	0.020	<0.010	0.06	<0.05	8.6
TP07	0.4	56	0.10	0.088	0.3	0.212	8.0
TP11	0.7	10	0.030	<0.010	0.09	<0.08	7.6
TP13	0.1	10	0.040	0.069	0.12	0.051	7.3
TP15	0.6	10	0.020	0.060	0.06	0	7.3
TP18	1.5	10	0.020	<0.010	0.06	<0.05	7.8
TP19	0.5	10	0.040	0.060	0.12	0.06	6.9
TP24	0.9	10	0.020	0.014	0.06	0.046	7.5

Notes:

The following stoichiometric equation was employed to determine the Total Potential Sulphate (TPS). $TPS (\% \text{ as } SO_4) = 3.0 \times \text{Total Sulphur (TS \% as S)}$.

The amount of Oxidisable Sulphides (OS as %SO₄) has been conservatively calculated by the following equation. $OS = TPS - \text{Acid Soluble Sulphate (AS)}$.

Based on results obtained, the characteristic values are provided below.

Sulphate (2:1 Water Soluble) as SO₄: 10-200mg/l
 pH: 6.9-8.6
 Total Potential Sulphate (TPS): 0.06-0.54%

The initial classification for the site based on sulphate (2:1 Water Soluble) as SO₄ is Design Sulphate (DS) Class DS-1. The Aggressive Chemical Environment for Concrete (ACEC) Class for the site based on sulphate (2:1 Water Soluble) as SO₄, mobile water and pH is AC-1.

SECTION 8 Engineering Recommendations

8.1 Preparation of Site

Prior to modification or demolition, the existing building must be subject to a refurbishment and demolition survey to identify any asbestos containing materials (ACM). Any deleterious materials must be removed by a suitably qualified person and disposed of at an appropriately licenced landfill. Precautions must be in place to prevent any contamination of the soils on site during the removal process.

Remaining structures, including foundations, and associated areas of hard standing over granular sub-base materials must be stripped and removed from beneath the proposed development area.

Areas of vegetation including all roots must be stripped and removed from beneath the proposed development site.

Allowances should be made for any temporary/permanent support works to any existing adjacent structure necessary as a result of the proposed works.

Allowances should also be made for dealing with buried basements which are considered likely in the vicinity of historical structures.

Contingencies should be made for the protection/diversion of any underground/overhead services present beneath/above the site brought about as a result of the proposed works.

Any reduced levels should be brought up to the required levels with suitable inert mainly granular materials. Department for Transport (DfT) type 2 sub-base or similar should be used and compacted in layers to the requirements of the Specification for Highway Works.

Allowances must also be made for the excavation of any soft spots/areas and their replacement with well compacted imported granular materials.

In accordance with EC Regulation 1272/2008 (Ref) and Environment Agency Guidance WM3 soils and other materials destined for off-site disposal must be classified on the basis of their hazard phrases prior to disposal. Soils are classified as a mirror entry waste and must be classified on the basis of their specific chemical properties. Terra Firma offer this service if required.

8.2 Foundation & Floor Slab Solution

The proposed development is to comprise the construction of 120no. traditional residential dwellings of masonry/timber construction.

The ground investigation confirmed the ground conditions beneath the site to comprise firm, clays between 0.6m and 2.6m depth below existing ground level Which was underlain by possible bedrock.

The presence of soluble limestone bedrock on the western part of the site provides a geotechnical risk and will require a specific foundation solution to mitigate the risk posed from dissolution. As such, the site has been split into two foundation zones. The foundation zones are presented in **Drawing 01**.

8.2.1 Recommended Foundation Solution – Zone A

Based on the proposed development and known ground conditions beneath the site, it is considered that a strip foundation founded within the firm to very stiff yellowish brown gravelly clay is used for buildings in this area. The founding strata can be found below 0.6m depth though this may be deeper in areas of made ground located around the existing/previous buildings.

In due consideration of the identified ground conditions, in-situ and laboratory geotechnical testing, Terra Firma has undertaken an assessment of the net safe allowable bearing pressure (ABP) with the underlying soils to assist in the detailed design of foundations and infrastructure and to determine a suitable target stratum. Based upon this assessment it is recommended that an allowable bearing capacity of 150kPa is used for strip foundations with widths up to 1m.

Foundations must sit at least 200mm within the founding horizon.

For the given foundation solutions and bearing pressure, maximum total settlements of 25mm should result with differential movements of the superstructure not exceeding 1:750.

Allowances should be made for the removal of any 'soft spots' and their replacement with well-compacted granular materials. Department for Transport (DfT) Type 2 materials or similar could be used and should be compacted in layers to the specification for Highway Works.

In order to protect the formations from the effect of frost heave and or thermal shrinkage the minimum foundation depth should be 900mm.

Deeper foundations will be required within influencing distance of tree root systems. The National House Building Council (NHBC) give guidelines based upon the tree type' distance for the tree and plasticity of the soil.

All foundation formations should be inspected by a suitably qualified Geotechnical Engineer before being concreted.

8.2.2 Recommended Foundation Solution – Zone B

Given the risk of dissolution in **Zone B**, it is recommended that a raft foundation or semi raft foundation is adopted for proposed buildings in the area. The raft/semi raft must be designed to span a soft spot of 3.0m with a cantilever effect on corners of 1.5m.

In due consideration of the identified ground conditions, in-situ and laboratory geotechnical testing, Terra Firma has undertaken an assessment of the net safe allowable bearing pressure (ABP) with the underlying soils to assist in the detailed design of foundations and infrastructure and to determine a suitable target stratum. Based upon this assessment it is recommended that an allowable bearing capacity of 100kPa is used for raft foundations. If a semi raft foundation (reinforced strips with suspended slab) is adopted then an allowable bearing capacity of 150kPa may be used for design purposes.

Foundations must sit at least 200mm within the founding horizon.

In order to protect the formations from the effect of frost heave and or thermal shrinkage the minimum foundation depth should be 900mm.

Deeper foundations will be required within influencing distance of tree root systems. The National House Building Council (NHBC) give guidelines based upon the tree type' distance for the tree and plasticity of the soil.

For the given foundation solutions and bearing pressure, maximum total settlements of <25mm should result with differential movements of the superstructure not exceeding 1:750.

8.2.3 Ground Floor Slabs

Current building control regulations require that where infilled ground is present to depths in excess of 600mm or where the sub-stratum is variable in terms of the structure and settlement potential or where clay soils are present within the influence of existing or proposed trees, a suspended floor slab is required.

In this instance it is considered that for the majority of substructures, the underlying stratum would be clay of medium volume change potential and as such a suspended floor slab will be required.

8.3 Excavations & Formations

Most of the shallow excavations will be possible with normal soil excavating machinery. Allowances for a breaker attachment will be required when dealing with areas of hard standing and buried obstructions / bedrock.

Shallow perched water and groundwater flows were not encountered during the investigation. Any water inflows together with rainwater infiltration should be dealt with by conventional pumping techniques. However, it should be noted that during times of heavy rainfall a higher water table will be encountered.

The sides of any excavations deeper than 1.20m, or shallower if unstable, should be supported by planking and strutting or other proprietary means.

The sub-formations/formations are likely to be susceptible to loosening, softening and deterioration by exposure to weather (rain, frost and drying conditions), the action of water (flood water or removal of groundwater) and site traffic.

Formations should never be left unprotected and continuously exposed to rain causing degradation, or left exposed/uncovered overnight, unless permitted by a qualified engineer.

Construction plant and other vehicular traffic should not be operated on unprotected formations.

As a minimum the formation/excavation surfaces must be protected by blinding concrete immediately after exposure.

Allowances should be made for the removal of soft spots/areas and their replacement with well compacted granular materials.

Allowances should also be made for special precautions to prevent formation deterioration in addition to the above.

8.4 Protection of Buried Concrete

Geotechnical testing of selected samples for concrete classification in accordance with BRE SD1:2015 are presented in Table 7.2.

When the results are compared with Table C2 of BRE Digest 1:2005, it indicates that buried concrete should generally conform to Class AC-1.

8.5 Access Roads & Car Parking Areas

For car parking and road areas, formations within the in-situ natural soils a California Bearing Ration (CBR) value of 5% may be used for design purposes.

Allowances should be made for the removal of any 'soft spots/areas' and their replacement with well-compacted granular materials as previously described.

Please note that the Local Council / Highways Authority may require in-situ CBR testing to be undertaken before a road is adopted. In-situ CBR testing should be performed following earthworks to verify the performance of the engineered fill.

8.6 Storm Water Drainage

During the site investigation three soakaway tests were undertaken in general accordance with BRE DG 365:2016. The soakaway test results are presented in **Table 8.1**.

The testing produced variable results which is attributed to the variation in weathering of the underlying bedrock and fractures and fissures therein. It is considered that infiltration drainage is feasible for the development though it is recommended that targeted investigation should be undertaken to confirm infiltration rates at the exact locations of infiltration features.

Table 8.1 Summary of Soakaway Results

Trial Pit	Depth Range of Test (m)	Geology Description	Infiltration Rate (ms ⁻¹)
TP23	0.4-1.15	slightly sandy gravelly silty CLAY with low cobble and boulder content	1.82 x10 ⁻⁰⁵
TP25	1-1.5	slightly sandy gravelly silty CLAY with low cobble and boulder content	No infiltration
TP26	0.5-1.0	slightly sandy gravelly silty CLAY with low cobble and boulder content	6.53x10 ⁻⁰⁵
TP27	0.5-1.2	slightly sandy gravelly silty CLAY with low cobble and boulder content	No infiltration
TP28	0.7-1.2	slightly sandy gravelly silty CLAY with low cobble and boulder content	2.21x10 ⁻⁰⁵
TP29	1.1-1.6	slightly sandy gravelly silty CLAY with low cobble and boulder content	No infiltration

Given the risk of dissolution in the Blue Lias formation, it is recommended that proposed soakaways must be positioned at least 10.0m away from any structure.

8.7 Retaining Walls

Due to the sloping nature of the site, retaining walls may be required. The existing steepness of any embankments should not be increased. Any cuts should be undertaken in small sections and in such a way so as not to induce any instability to the ground.

Effective shear parameters for retaining wall design are presented in **Table 8.2**.

Table 8.2 Effective Shear Stress Parameters

Stratum Description	Bulk Unit Weight (γ) kN/m ³	Effective Cohesion (c') kN/m ²	Effective Angle of Shearing Resistance (ϕ') degrees
Firm to stiff cohesive soils	18	0	30
Well compacted, granular materials, compacted as per Specification for Highway Works and other relevant guidance such as British Standards (BS) 6031: 1981. Code of Practice for Earthworks.	19 – 20	0	30 - 35
Fresh/slightly weathered mudstone/limestone bedrock	19-24	5	35 - 40
Moderately / highly weathered Mudstone/limestone bedrock	19-24	0	30 – 35

The parameters are based on experience in similar ground conditions.

The materials to be in-filled behind the retaining wall must be placed at or close to its optimum moisture content/maximum dry density and compacted in layers as per the requirements of the Specification for Highway Works. During the earthworks suitable in-situ testing must be carried out to ensure that the compaction process is achieving the required maximum dry density to achieve at least 95% compaction.

The acceptability of the filling works must be verified by appropriate on-site testing. A certification report must also be prepared on the earthworks by a suitably qualified Geotechnical Engineer.

Appropriate drainage must be incorporated in the design to prevent the build-up of hydrostatic pressure.

Appropriate cutting and benching of the existing slope must be conducted prior to the replacement of any imported fill to minimise the risk of any slip surfaces forming on the interface between the existing imported materials.

8.8 Re-Use of Demolition Materials

TFW Group Limited are aware that there is currently a structure located on the study site and that this will be demolished as part of the development programme. TFW Group Limited are not currently aware of the mass balance of the project and whether there is a net excess, or net deficit, of material at the site. Notwithstanding, material management should be considered from the earliest stage to ensure that materials are not cross contaminated, unnecessary costs are not incurred and the developer does not fall foul of waste legislation.

TFW Group Limited would recommend that, at the earliest convenience, a mass balance calculation be made for the development. This will allow TFW Group to undertake a feasibility study to determine whether the development achieves the criteria for a CL:AIRE Definition of Waste – Development Industry Code of Practice (DoW:CoP) Material Management Plan (MMP) to reuse site won material, import suitable clean natural soils from other sites or export suitable excess material to other nearby development sites.

Prior to the demolition of the existing structure, it is essential to undertake a pre-demolition asbestos survey and ensure asbestos, if present, is completely removed by an appropriately certified contractor prior to demolition. Failure to do so could lead to asbestos contamination

of the demolition rubble, creating hazardous mixed waste, which would not be suitable for re-use as an aggregate and have a significantly higher disposal cost.

If it is proposed to generate a 'non-waste' recycled aggregate for off-site re-use, the developer could consider using WRAP Quality Protocol. The protocol will require a geotechnical and chemical test regime to be prepared in advance to ensure the generated aggregate achieves the necessary standards.

If the reuse/import of soils and demolition rubble achieves the criteria for a CLAIRE DoW:CoP MMP the application should be submitted in advance of any earthworks as MMPs are not designed for retrospective application and require a period of consultation with regulators and a CL:AIRE Qualified Person (QP).

In accordance with the Environment Agency Waste Hierarchy, re-use of suitable material is preferable to disposal. However, if unsuitable materials are encountered which require off-site disposal these should be subject to Total and WAC Analysis, and classified in accordance with Environment Agency document WM3 and, on the basis of this classification, disposed to an appropriate licenced facility.

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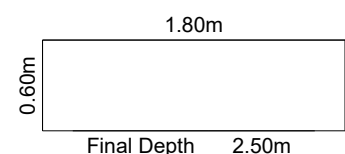
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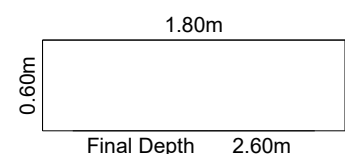
Standard Publications

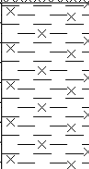
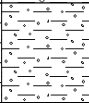
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ANNEX A
Trial Pit Logs





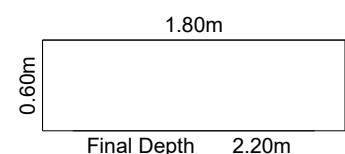


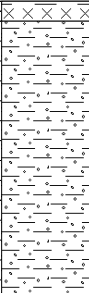
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Client Bellway Homes Limited				Co-ords E: 289073.48 N: 178655.32 L: 23.83		Water Strike Details Depth Strike Remarks				Logged By ES	
Contractor Pritchards				Plant Used 8T						Approved By	
										Scale 1:50	
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend					
Results	Type	Depth									
	ES	0.20 - 0.30	(0.40)	23.43	MADE GROUND. [Soft] slightly sandy gravelly CLAY with occasional brick concrete and timber fragments. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies. ()						
			0.40		Firm yellowish brown sightly sandy silty CLAY. Sand is fine to coarse. ()						
	D	0.90 - 1.00	(0.90)	22.53	Firm yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone. ()						
			1.30								
		(0.50)	22.03	End of Trial Pit at 1.80m							
		1.80									
Remarks											
1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.											
Pit Stability: Stable											
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											

0.60m

1.80m

Final Depth 1.80m

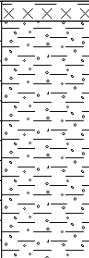


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Client Bellway Homes Limited				Co-ords E: 289105.55 N: 178649.24 L: 22.85		Water Strike Details Depth Strike Remarks				Logged By ES		
Contractor Pritchards				Plant Used 8T						Approved By		
										Scale 1:50		
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend						
Results	Type	Depth										
	D ES		(0.10) 0.10	22.75	Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies ()							
			(1.40)	1	Very stiff yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone ()							
		1.00 - 1.10 1.00 - 1.10		1.50	21.35							End of Trial Pit at 1.50m
Remarks												
1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.												
Pit Stability: Stable												
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.												

0.60m

1.80m

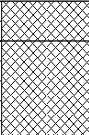
Final Depth 1.50m

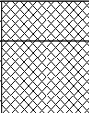
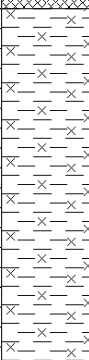
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Contractor Pritchards				Plant Used 8T						Approved By	
										Scale 1:50	
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend					
Results	Type	Depth									
	ES	0.60	(0.10) 0.10	23.06	Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies () Very stiff yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone ()						
			(1.20)								
			1			End of Trial Pit at 1.30m					
			1.30	21.86							
			2								
			3								
			4								
Remarks											
1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.											
Pit Stability: Stable											
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											

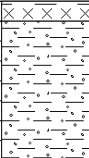
0.60m

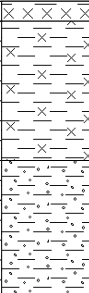
1.80m

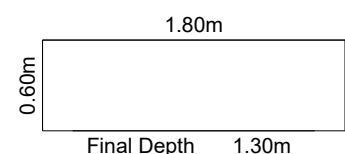
Final Depth 1.30m

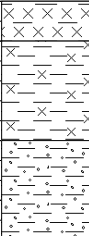
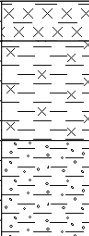
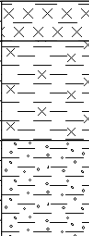
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										Scale 1:50	
Samples and Results			Depth, (Thickness)	Level	Stratum Description					Legend	
Results	Type	Depth									
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	ES	0.40	(0.50) 0.70		MADE GROUND. [Soft] slightly sandy gravelly CLAY with occasional brick concrete and timber fragments. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies. () 0.20 to 0.20m - At 0.20m: Black membrane.						
					End of Trial Pit at 0.70m						
1 2 3 4											
Remarks											
1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on possible concrete slab. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.											
Pit Stability: Stable											
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											
0.60m 1.80m Final Depth 0.70m											

		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. TP08 Sheet 1 of 1								
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Contractor Pritchards				Plant Used 8T						Approved By								
										Scale 1:50								
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend												
Results	Type	Depth																
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			0.20		MADE GROUND. Yellow angular and subangular fine and medium GRAVEL of limestone. ()													
			(0.40)															
	D ES	0.80 0.80	0.60	24.72	Firm yellowish brown sightly sandy silty CLAY. Sand is fine to coarse. ()													
			1															
			(1.80)															
			2															
			2.40		22.92							Firm yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone. ()						
			(0.20)															
			2.60															
					End of Trial Pit at 2.60m													
Remarks 1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.																		
Pit Stability: Stable																		
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.																		
0.60m 1.80m Final Depth 2.60m																		

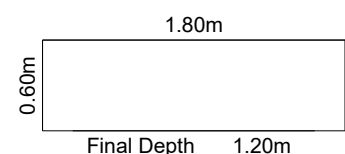
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Project Name Craig-y-Parcau				Project No. TF-24-589-CA		Date 06/11/2024 to 06/11/2024				Hole Type TP	
Client Bellway Homes Limited				Co-ords E: 288988.69 N: 178691.01 L: 21.08		Water Strike Details Depth Strike Remarks				Logged By ES	
Contractor Pritchards				Plant Used 8T						Approved By	
										Scale 1:50	
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend					
Results	Type	Depth									
	ES	0.05	(0.10) 0.10	20.98	Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies () Very stiff yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone ()						
	D	0.80	(0.70) 0.80	20.28							
					End of Trial Pit at 0.80m						
1 2 3 4											
Remarks											
1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.											
Pit Stability: Stable											
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											
0.60m 1.80m Final Depth 0.80m											

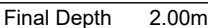
		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. TP10 Sheet 1 of 1	
Project Name Craig-y-Parcau				Project No. TF-24-589-CA		Date 06/11/2024 to 06/11/2024				Hole Type TP	
Client Bellway Homes Limited				Co-ords E: 289026.00 N: 178670.85 L: 22.70		Water Strike Details Depth Strike Remarks				Logged By ES	
Contractor Pritchards				Plant Used 8T						Approved By	
										Scale 1:50	
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend					
Results	Type	Depth									
	D ES	1.50 1.50	(0.10) 0.10	22.60	Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies () Firm yellowish brown sightly sandy silty CLAY. Sand is fine to coarse. ()						
			(0.70)								
			0.80	21.90	Very stiff yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone ()						
			(0.70)								
			1.50	21.20	End of Trial Pit at 1.50m						
2 3 4											
Remarks 1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.											
Pit Stability: Stable											
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											
0.60m 1.80m Final Depth 1.50m											

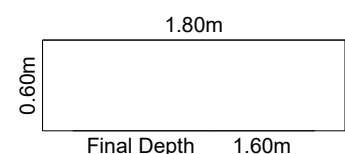


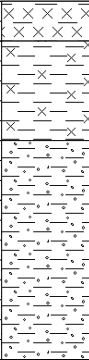
		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. TP12 Sheet 1 of 1	
Project Name Craig-y-Parcau				Project No. TF-24-589-CA		Date 07/11/2024 to 07/11/2024				Hole Type TP	
Client Bellway Homes Limited				Co-ords E: 288826.57 N: 178671.41 L: 29.43		Water Strike Details Depth Strike Remarks				Logged By ES	
Contractor Pritchards				Plant Used 8T						Approved By	
										Scale 1:50	
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend					
Results	Type	Depth									
	ES	1.00	(0.20)	29.23	Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies ()						
			0.20		Firm orangish brown sightly sandy silty CLAY. Sand is fine to coarse. ()						
			(0.50)	28.73	Very stiff greyish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone ()						
			0.70								
			(0.50)								
			1.20	28.23	End of Trial Pit at 1.20m						
Remarks 1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered. Pit Stability: Stable Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											
0.60m 1.80m Final Depth 1.20m											

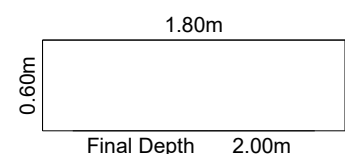


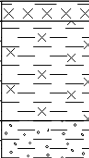






		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. TP17 Sheet 1 of 1	
Project Name Craig-y-Parcau				Project No. TF-24-589-CA		Date 07/11/2024 to 07/11/2024				Hole Type TP	
Client Bellway Homes Limited				Co-ords E: 289107.46 N: 178567.17 L: 19.97		Water Strike Details Depth Strike Remarks				Logged By ES	
Contractor Pritchards				Plant Used 8T						Approved By	
										Scale 1:50	
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend					
Results	Type	Depth									
	ES	0.10	(0.20) 0.20	19.77	Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies ()						
			(0.50)		Firm yellowish brown sightly sandy silty CLAY. Sand is fine to coarse. ()						
			0.70	19.27	Firm yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone ()						
	D	1.20	(1.10)								
		1.80	18.17	End of Trial Pit at 1.80m							
1 2 3 4											
Remarks 1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.											
Pit Stability: Stable											
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											
0.60m 1.80m Final Depth 1.80m											

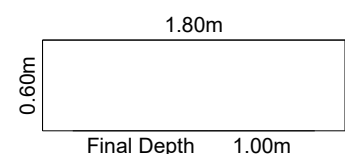


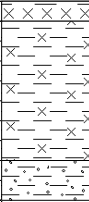
		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. TP19 Sheet 1 of 1	
Project Name Craig-y-Parcau				Project No. TF-24-589-CA		Date 07/11/2024 to 07/11/2024				Hole Type TP	
Client Bellway Homes Limited				Co-ords E: 289044.41 N: 178516.46 L: 21.39		Water Strike Details Depth Strike Remarks				Logged By ES	
Contractor Pritchards				Plant Used 8T						Approved By	
										Scale 1:50	
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend					
Results	Type	Depth									
	D ES	0.50 0.50	(0.10)	21.29	Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies () Firm yellowish brown sightly sandy silty CLAY. Sand is fine to coarse. ()						
			0.10								
			(0.50)								
			0.60								
			(0.20)								
			0.80								
			20.79								
			20.59								
			1								
			2								
3											
4											
Remarks 1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.											
Pit Stability: Stable											
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											

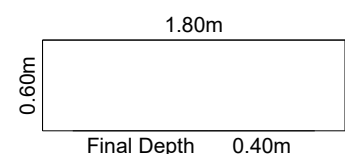
0.60m

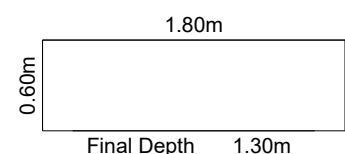
1.80m

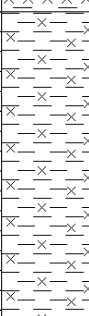
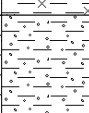
Final Depth 0.80m



		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. TP21 Sheet 1 of 1	
Project Name Craig-y-Parcau				Project No. TF-24-589-CA		Date 07/11/2024 to 07/11/2024				Hole Type TP	
Client Bellway Homes Limited				Co-ords E: 289045.68 N: 178561.13 L: 22.63		Water Strike Details Depth Strike Remarks				Logged By ES	
Contractor Pritchards				Plant Used 8T						Approved By	
										Scale 1:50	
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend					
Results	Type	Depth									
	ES	0.10	(0.10) 0.10	22.53	Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies ()						
	D	0.40	(0.70)		Firm yellowish brown sightly sandy silty CLAY. Sand is fine to coarse. ()						
			0.80 (0.20) 1.00	21.83 21.63	Firm yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone ()						
					End of Trial Pit at 1.00m						
1 2 3 4											
Remarks 1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.											
Pit Stability: Stable											
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											
0.60m 1.80m Final Depth 1.00m											





		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. TP24 Sheet 1 of 1		
Project Name Craig-y-Parcau				Project No. TF-24-589-CA		Date 08/11/2024 to 08/11/2024				Hole Type TP		
Client Bellway Homes Limited				Co-ords E: 288979.21 N: 178595.37 L: 21.92		Water Strike Details Depth Strike Remarks				Logged By ES		
Contractor Pritchards				Plant Used 8T						Approved By		
										Scale 1:50		
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend						
Results	Type	Depth										
	ES	0.90	(0.50)	21.42	Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies ()							
			0.50		Firm yellowish brown sightly sandy silty CLAY. Sand is fine to coarse. ()							
			1	(1.60)	19.82	Firm yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone. ()						
			2	2.10								
			3	(0.50)	19.32	End of Trial Pit at 2.60m						
4	2.60											

Remarks

1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.

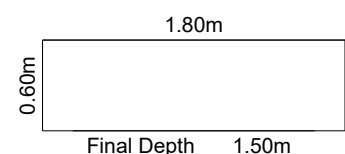
Pit Stability: Stable

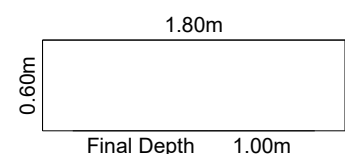
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

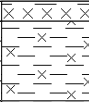
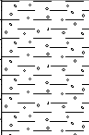
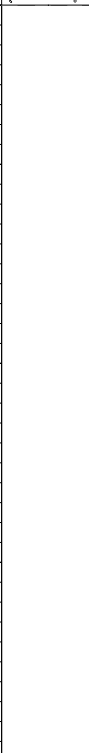
0.60m

1.80m

Final Depth 2.60m



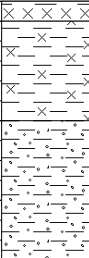
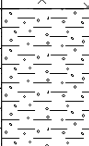


		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. TP27 Sheet 1 of 1	
Project Name Craig-y-Parcau				Project No. TF-24-589-CA		Date 08/11/2024 to 08/11/2024				Hole Type TP	
Client Bellway Homes Limited				Co-ords E: 288955.36 N: 178577.25 L: 20.33		Water Strike Details Depth Strike Remarks				Logged By ES	
Contractor Pritchards				Plant Used 8T						Approved By	
										Scale 1:50	
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend					
Results	Type	Depth									
			(0.10)	20.23	Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies () Firm yellowish brown sightly sandy silty CLAY. Sand is fine to coarse. ()						
			0.10								
			(0.40)								
			0.50	19.83	Stiff yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone ()						
			(0.70)								
1	19.13	End of Trial Pit at 1.20m									
1.20											
2											
3											
4											
Remarks 1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.											
Pit Stability: Stable											
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											

0.60m

1.80m

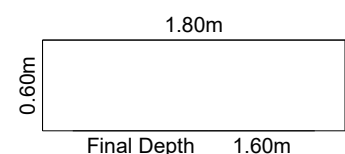
Final Depth 1.20m

		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. TP28 Sheet 1 of 1	
Project Name Craig-y-Parcau				Project No. TF-24-589-CA		Date 08/11/2024 to 08/11/2024				Hole Type TP	
Client Bellway Homes Limited				Co-ords E: 288990.56 N: 178554.19 L: 21.87		Water Strike Details Depth Strike Remarks				Logged By ES	
Contractor Pritchards				Plant Used 8T						Approved By	
										Scale 1:50	
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend					
Results	Type	Depth									
	ES	0.05	(0.10) 0.10	21.77	Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies () Firm yellowish brown sightly sandy silty CLAY. Sand is fine to coarse. ()						
			(0.50)								
	D	0.60	0.60	21.27	Stiff yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone ()						
			(0.70)								
			1.30	20.57	End of Trial Pit at 1.30m						
Remarks											
1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.											
Pit Stability: Stable											
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											

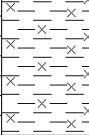
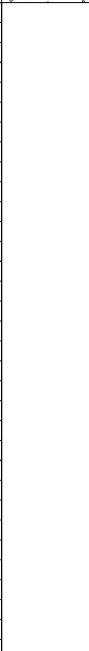
0.60m

1.80m

Final Depth 1.30m



		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. TP30 Sheet 1 of 1			
Project Name Craig-y-Parcau				Project No. TF-24-589-CA		Date 08/11/2024 to 08/11/2024				Hole Type TP			
Client Bellway Homes Limited				Co-ords E: 289034.63 N: 178550.80 L: 22.54		Water Strike Details Depth StrikeRemarks				Logged By ES			
Contractor Pritchards				Plant Used 8T						Approved By			
										Scale 1:50			
Samples and Results			Depth, (Thickness)		Level		Stratum Description				Legend		
Results		Type	Depth										
				(0.10) 0.10	22.44		Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies ()						
				(0.50)			Firm yellowish brown sightly sandy silty CLAY. Sand is fine to coarse. ()						
				0.60 (0.20) 0.80	21.94		Stiff yellowish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone ()						
					21.74		End of Trial Pit at 0.80m						
				1									
				2									
				3									
				4									
Remarks													
1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.													
Pit Stability: Stable													
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.													
0.60m 1.80m Final Depth 0.80m													

		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. TP31 Sheet 1 of 1	
Project Name Craig-y-Parcau				Project No. TF-24-589-CA		Date 08/11/2024 to 08/11/2024				Hole Type TP	
Client Bellway Homes Limited				Co-ords E: 288883.09 N: 178707.62 L: 24.65		Water Strike Details Depth Strike Remarks				Logged By ES	
Contractor Pritchards				Plant Used 8T						Approved By	
										Scale 1:50	
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend					
Results	Type	Depth									
			(0.20)	24.45	Grass over soft brown slightly gravelly slightly sandy clayey SILT. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mixed lithologies ()						
			0.20		Firm orangish brown sightly sandy silty CLAY. Sand is fine to coarse. ()						
			(0.70)	23.75	Very stiff greyish brown slightly sandy gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobbles are angular and subangular of limestone. Boulders are angular and subangular of limestone ()						
			0.90								
			(0.80)								
1.70	22.95	End of Trial Pit at 1.70m									
2											
3											
4											
Remarks											
1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated on boulder/bedrock refusal. 4] Trial pit backfilled with arisings. 5] No groundwater was encountered.											
Pit Stability: Stable											
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											

0.60m

1.80m

Final Depth 1.70m

ANNEX B
Soakaway Results



SOAKAWAY TEST



Site Name: Craig-y-Parcau
Project Number: TF-24-589-CA
Date: 08-Nov
Engineer: Elliot

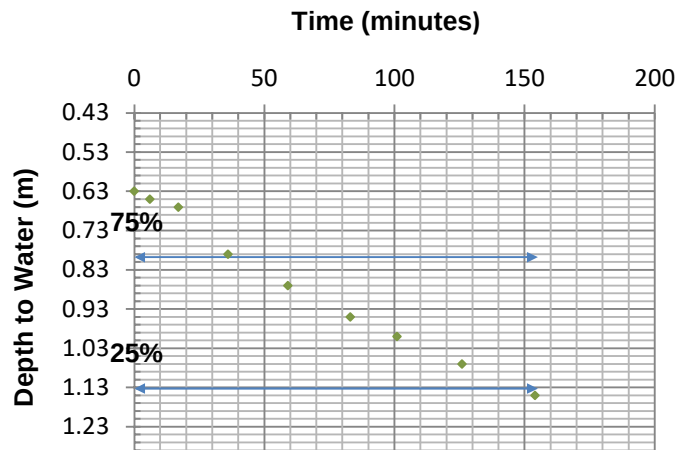
Trial Pit: TP23

TEST 1

Length 1.70 m
Width 0.60 m
Depth 1.30 m
Fill Level 0.63 m

V_{p75-25} 0.342 m³
 a_{p50} 2.561 m²
 t_{p75-25} 102 minutes

Soil Infiltration Rate, f 2.18E-05 ms⁻¹

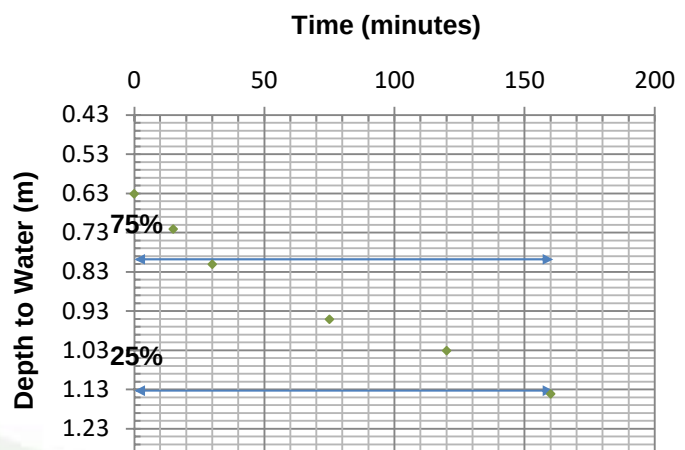


TEST 2

Length 1.70 m
Width 0.60 m
Depth 1.30 m
Fill Level 0.63 m

V_{p75-25} 0.342 m³
 a_{p50} 2.561 m²
 t_{p75-25} 122 minutes

Soil Infiltration Rate, f 1.82E-05 ms⁻¹

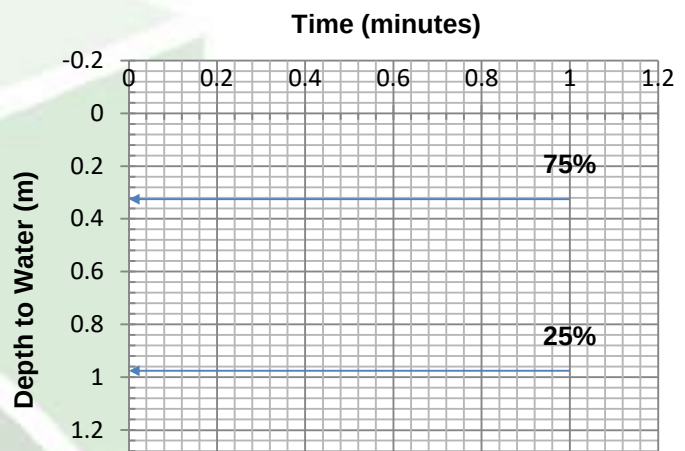


TEST 3

Length 1.70 m
Width 0.60 m
Depth 1.30 m
Fill Level 0.63 m

V_{p75-25} 0.663 m³
 a_{p50} 4.01 m²
 t_{p75-25} 0 minutes

Soil Infiltration Rate, f ms⁻¹
Insufficient site time to complete third fill



REMARKS:

Test carried out in accordance with BRE Digest 365 (2016)

SOAKAWAY TEST



Site Name: Craig-y-Parcau
Project Number: TF-24-589-CA
Date: 08-Nov
Engineer: Elliot

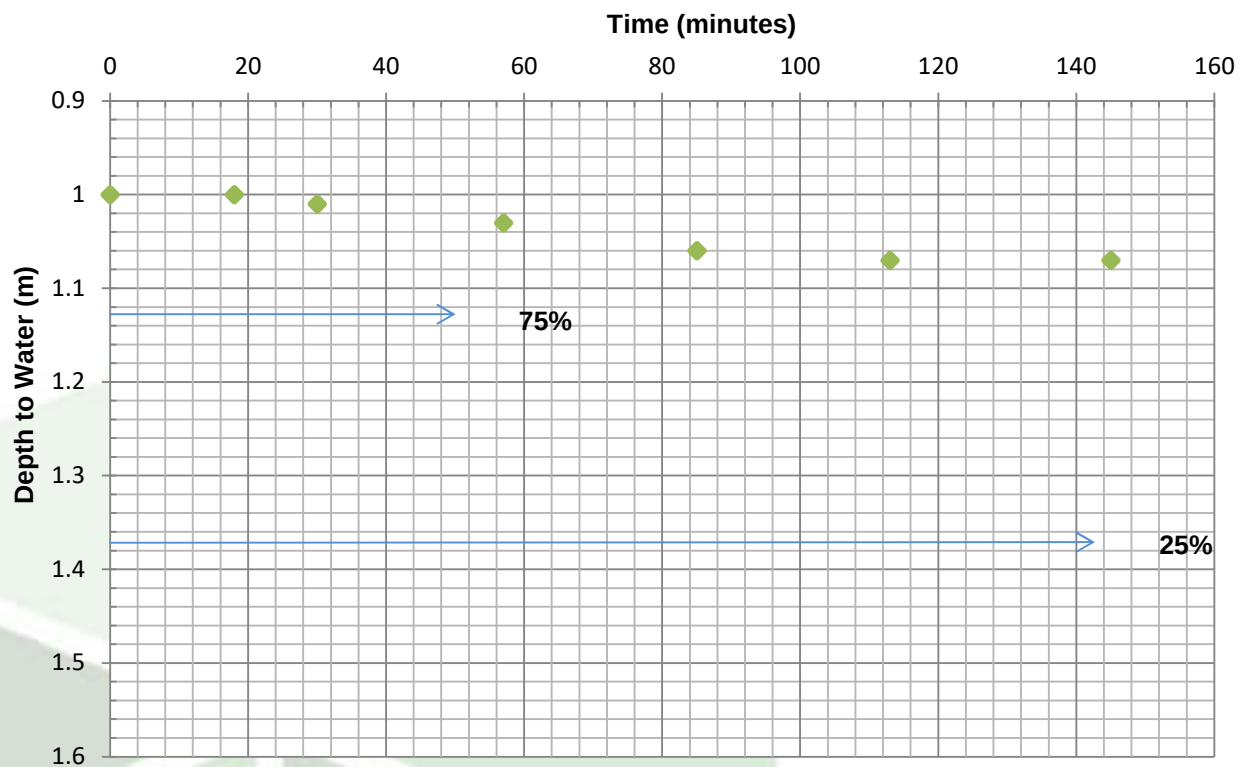
TrialPit: **TP25**

TEST 1

Length	1.70 m
Width	0.60 m
Depth	1.50 m
Fill Level	1.00

V_{p75-25}	0.071 m ³
a_{p50}	0.754 m ²
t_{p75-25}	0 minutes

Soil Infiltration Rate, f insufficient flow to calculate infiltration rate



REMARKS:

Test carried out in accordance with BRE Digest 365 (2016)

SOAKAWAY TEST



Site Name: Craig-y-Parcau
Project Number: TF-24-589-CA
Date: 08-Nov
Engineer: Elliot

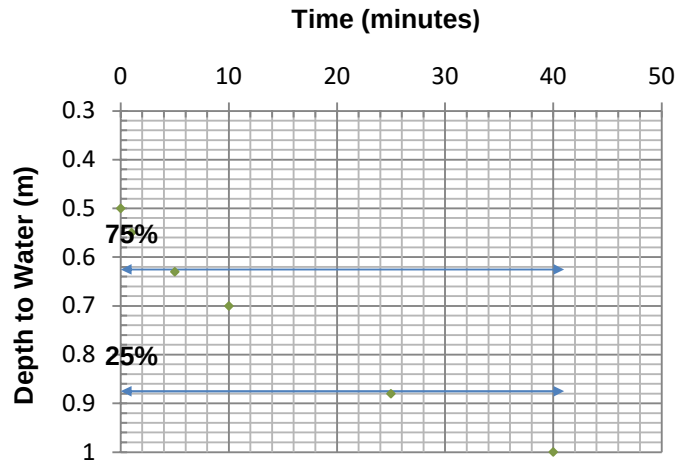
Trial Pit: TP26

TEST 1

Length 1.70 m
Width 0.60 m
Depth 1.00 m
Fill Level 0.50 m

V_{p75-25} 0.255 m³
 a_{p50} 2.17 m²
 t_{p75-25} 20 minutes

Soil Infiltration Rate, f 9.79E-05 ms⁻¹

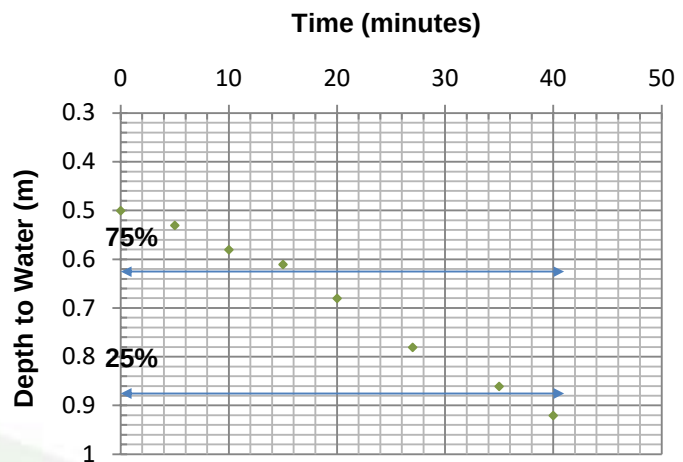


TEST 2

Length 1.70 m
Width 0.60 m
Depth 1.00 m
Fill Level 0.50 m

V_{p75-25} 0.255 m³
 a_{p50} 2.17 m²
 t_{p75-25} 23 minutes

Soil Infiltration Rate, f 8.52E-05 ms⁻¹

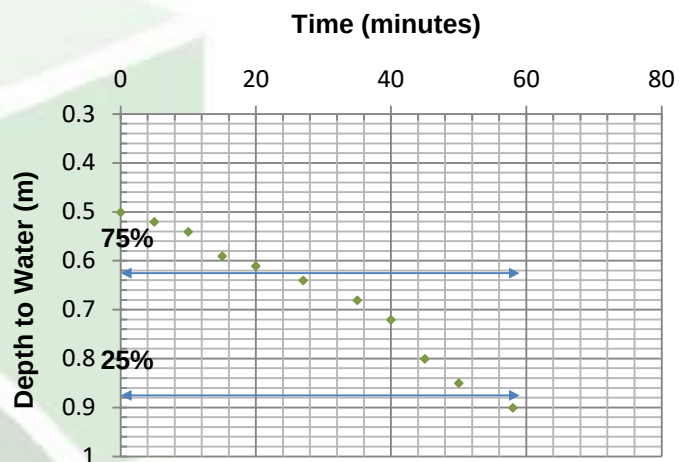


TEST 3

Length 1.70 m
Width 0.60 m
Depth 1.00 m
Fill Level 0.50 m

V_{p75-25} 0.255 m³
 a_{p50} 2.17 m²
 t_{p75-25} 30 minutes

Soil Infiltration Rate, f 6.53E-05 ms⁻¹



REMARKS:

Test carried out in accordance with BRE Digest 365 (2016)

SOAKAWAY TEST



Site Name: Craig-y-Parcau
Project Number: TF-24-589-CA
Date: 08-Nov
Engineer: Elliot

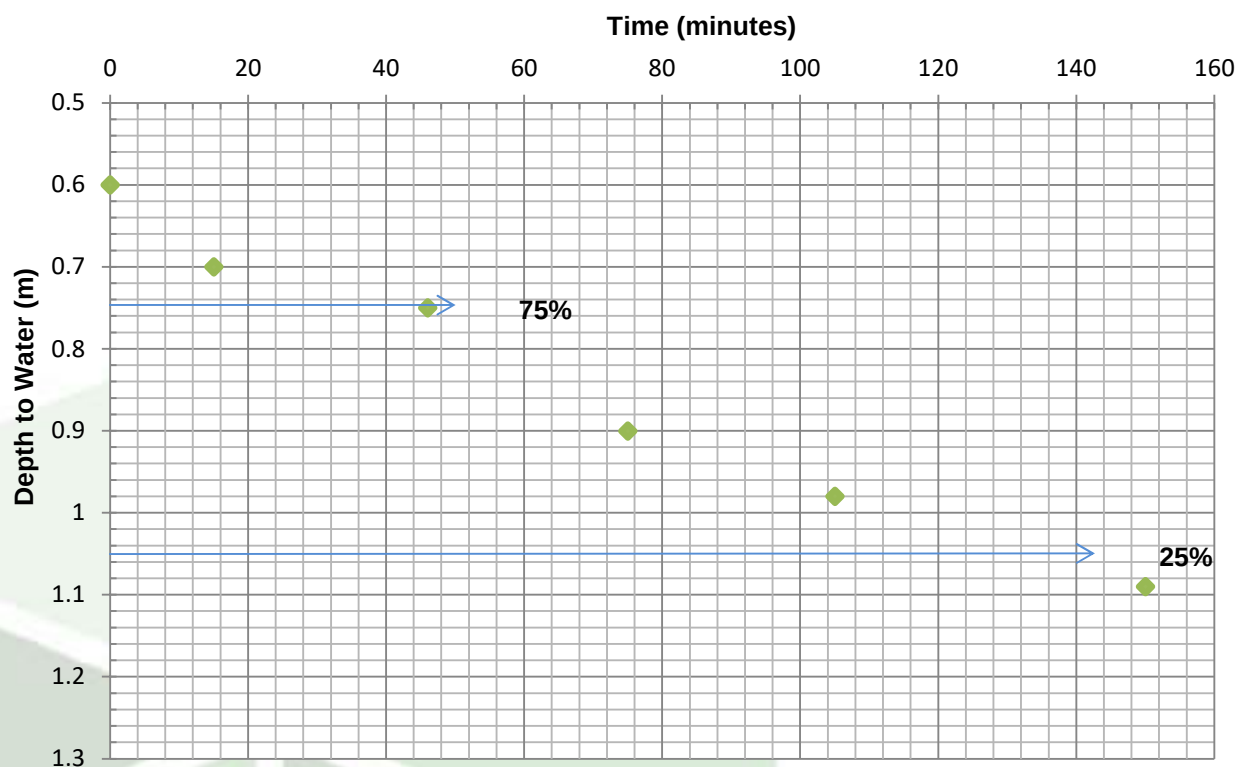
Trial Pit: **TP27**

TEST 1

Length	1.70 m
Width	0.60 m
Depth	1.20 m
Fill Level	0.60

V_{p75-25} 0.085 m³
 a_{p50} 0.848 m²
 t_{p75-25} 94 minutes

Soil Infiltration Rate, f 2.08E-05



REMARKS:

Test carried out in accordance with BRE Digest 365 (2016). Insufficient site time to complete additional fills

SOAKAWAY TEST



Site Name: Craig-y-Parcau
Project Number: TF-24-589-CA
Date: 08-Nov
Engineer: Elliot

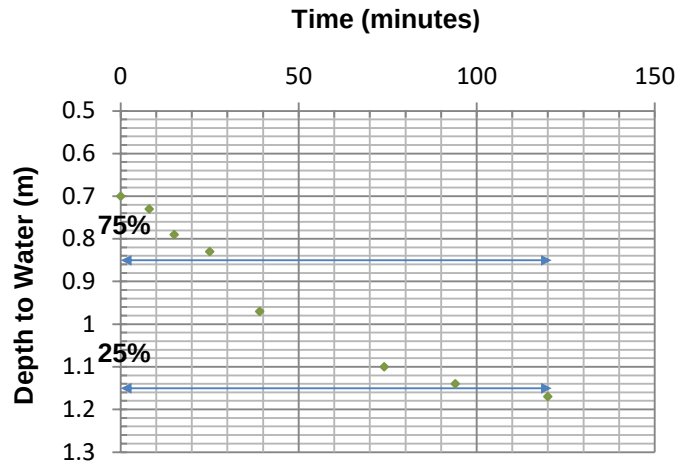
Trial Pit: TP28

TEST 1

Length 1.70 m
Width 0.60 m
Depth 1.30 m
Fill Level 0.70 m

V_{p75-25} 0.306 m³
 a_{p50} 2.4 m²
 t_{p75-25} 67 minutes

Soil Infiltration Rate, f 3.17E-05 ms⁻¹

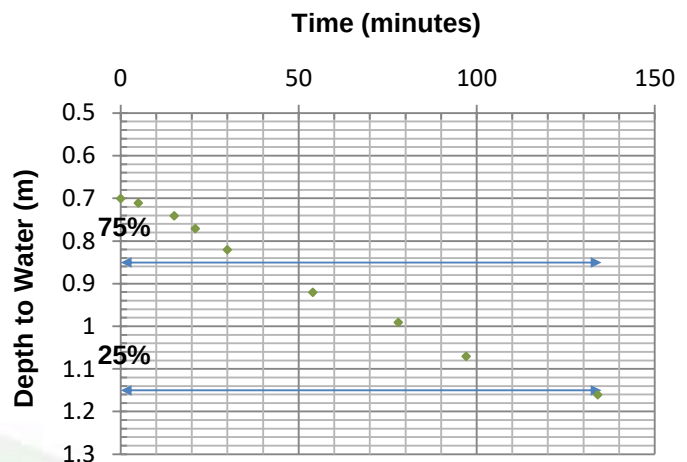


TEST 2

Length 1.70 m
Width 0.60 m
Depth 1.30 m
Fill Level 0.70 m

V_{p75-25} 0.306 m³
 a_{p50} 2.4 m²
 t_{p75-25} 96 minutes

Soil Infiltration Rate, f 2.21E-05 ms⁻¹

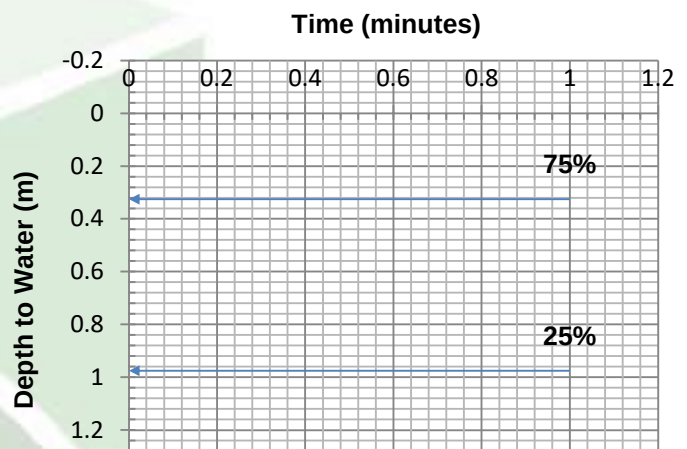


TEST 3

Length 1.70 m
Width 0.60 m
Depth 1.30 m
Fill Level m

V_{p75-25} 0.663 m³
 a_{p50} 4.01 m²
 t_{p75-25} 0 minutes

Soil Infiltration Rate, f ms⁻¹
Insufficient site time to complete third fill



REMARKS:

Test carried out in accordance with BRE Digest 365 (2016)

SOAKAWAY TEST



Site Name: Craig-y-Parcau
Project Number: TF-24-589-CA
Date: 08-Nov
Engineer: Elliot

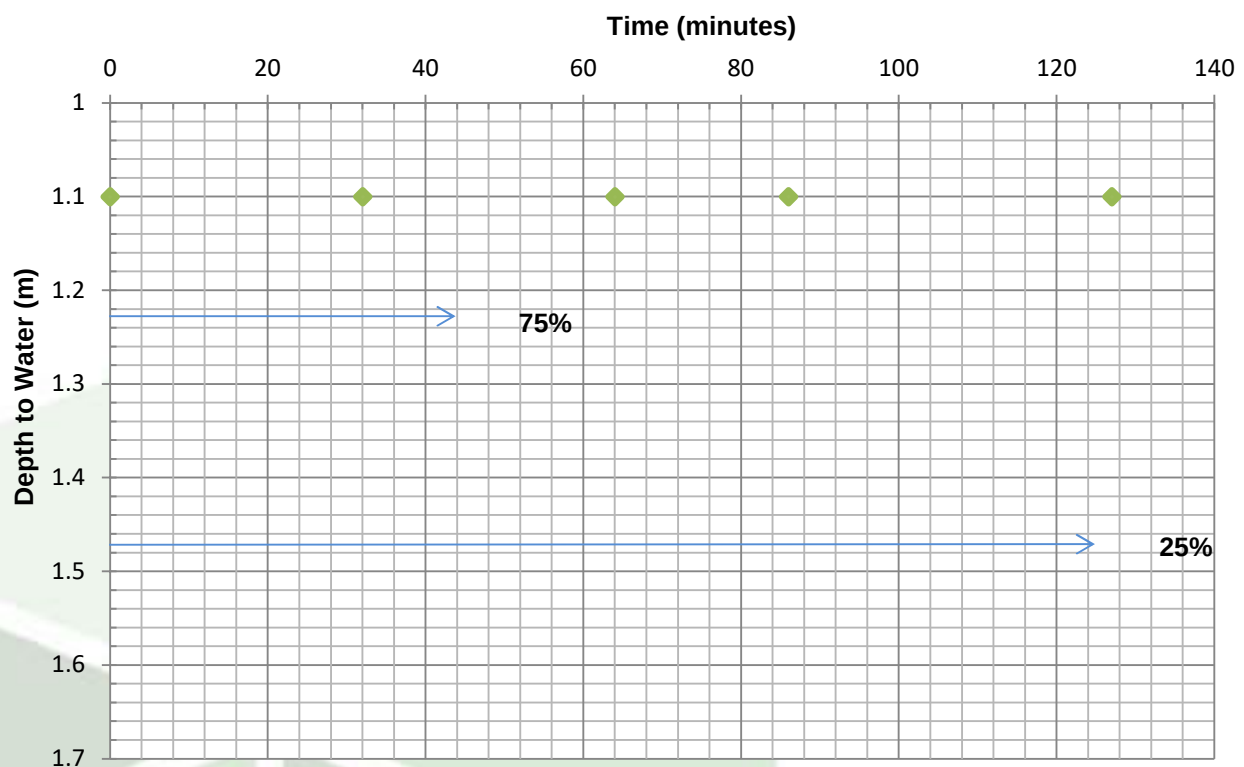
TrialPit: **TP29**

TEST 1

Length	1.70 m
Width	0.60 m
Depth	1.60 m
Fill Level	1.10

V_{p75-25}	0.071 m ³
a_{p50}	0.754 m ²
t_{p75-25}	0 minutes

Soil Infiltration Rate, f insufficient flow to calculate infiltration rate



REMARKS:

Test carried out in accordance with BRE Digest 365 (2016)

ANNEX C
Laboratory Chemical Test Results





Amended Report

Report No.: 24-36973-2

Initial Date of Issue: 21-Nov-2024 **Date of Re-Issue:** 28-Nov-2024

Re-Issue Details: This report has been revised and directly supersedes 24-36973-1 in its entirety

Client: Terra Firma

Client Address: 5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Contact(s): elliot@terrafirmawales.co.uk

Project: Bridgend

Quotation No.: **Date Received:** 13-Nov-2024

Order No.: 24-589-CA **Date Instructed:** 13-Nov-2024

No. of Samples: 30

Turnaround (Wkdays): 13 **Results Due:** 29-Nov-2024

Date Approved: 28-Nov-2024

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:		24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:		1894224	1894225	1894226	1894227	1894228	1894229	1894230		
		Client Sample ID.:		ES1TP01	ES1TP02	ES1TP03	ES1TP04	ES1TP05	ES1TP06	ES1TP07		
		Sample Location:		TP01	TP02	TP03	TP04	TP05	TP06	TP07		
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
		Top Depth (m):		0.2	0.5	0.2	0.5	1	0.6	0.1		
		Bottom Depth (m):		0.3	0.6	0.3	0.6	1.1	0.6	0.1		
		Date Sampled:		08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024		
		Time Sampled:		12:00	12:00	12:00	12:00	12:00	12:00	12:00		
		Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM		
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
ACM Type		U	2192		N/A	-	-	-	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry		U	2192	%	0.001							
Total Asbestos		U	2192	%	0.001							
Moisture		N	2030	%	0.020	28	27	20	20	15	17	4.0
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones, Wood and Roots	Stones and Roots	Stones and Roots	None	Stones	Stones	Stones
Soil Texture		N	2040		N/A	Loam	Loam	Loam	Clay	Clay	Clay	Sand
pH at 20C		M	2010		4.0	8.4	8.8	9.3	8.3	8.7	8.6	8.6
pH (2.5:1) at 20C		N	2010		4.0	7.7			7.8			8.8
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	1.1	0.41	0.65	< 0.40	< 0.40	< 0.40	< 0.40
Magnesium (Water Soluble)		N	2120	g/l	0.010	< 0.010			< 0.010			< 0.010
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.20			< 0.010			< 0.010
Total Sulphur		U	2175	%	0.010	0.18			0.020			0.020
Chloride (Water Soluble)		M	2220	g/l	0.010	0.010			< 0.010			< 0.010
Nitrate (Water Soluble)		N	2220	g/l	0.010	< 0.010			< 0.010			< 0.010
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ammonium (Water Soluble)		M	2220	g/l	0.01	< 0.01			< 0.01			< 0.01
Sulphate (Acid Soluble)		U	2430	%	0.010	0.16	0.16	0.11	0.036	0.033	0.032	< 0.010
Arsenic		M	2455	mg/kg	0.5	13	13	17	14	8.0	11	3.0
Beryllium		U	2455	mg/kg	0.5	0.7	0.6	0.9	2.2	0.8	1.9	< 0.5
Cadmium		M	2455	mg/kg	0.10	0.47	0.46	0.62	1.0	0.10	0.70	0.75
Chromium		M	2455	mg/kg	0.5	15	8.2	13	22	13	16	10
Mercury Low Level		N	2450	mg/kg	0.05	0.05	0.08	0.16	0.07	< 0.05	< 0.05	< 0.05
Manganese		M	2455	mg/kg	1.0	780	490	690	1400	380	360	490
Molybdenum		M	2455	mg/kg	0.5	1.6	1.3	1.7	7.1	1.7	2.1	< 0.5
Antimony		N	2455	mg/kg	2.0	< 2.0	< 2.0	3.5	< 2.0	< 2.0	< 2.0	< 2.0
Copper		M	2455	mg/kg	0.50	19	26	50	23	19	20	5.5
Nickel		M	2455	mg/kg	0.50	18	16	23	30	26	29	5.1
Lead		M	2455	mg/kg	0.50	81	90	210	28	17	20	15
Selenium		M	2455	mg/kg	0.25	1.2	0.90	1.4	2.6	1.1	2.1	0.39
Zinc		M	2455	mg/kg	0.50	91	96	200	130	21	28	29

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:						24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:						1894224	1894225	1894226	1894227	1894228	1894229	1894230
		Client Sample ID.:						ES1TP01	ES1TP02	ES1TP03	ES1TP04	ES1TP05	ES1TP06	ES1TP07
		Sample Location:						TP01	TP02	TP03	TP04	TP05	TP06	TP07
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):						0.2	0.5	0.2	0.5	1	0.6	0.1
		Bottom Depth (m):						0.3	0.6	0.3	0.6	1.1	0.6	0.1
		Date Sampled:						08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:						DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
Chromium (Trivalent)		N	2490	mg/kg	1.0	15	8.2	13	22	13	16	10		
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25		
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0		
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	42	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	69	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0		
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	91	4.4	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0		
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	150	< 10	< 10	< 10	< 10	< 10	< 10		
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	200	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	350	< 10	< 10	< 10	< 10	< 10	< 10		
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25		
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	33	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	12	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0		
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	38	3.8	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0		
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	38	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	84	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	120	< 10	< 10	< 10	< 10	< 10	< 10		
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	290	< 10	< 10	< 10	< 10	< 10	< 10		
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	470	< 10	< 10	< 10	< 10	< 10	< 10		
Naphthalene		M	2800	mg/kg	0.10	< 0.10	0.14	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Fluorene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Phenanthrene		M	2800	mg/kg	0.10	< 0.10	0.35	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		
Fluoranthene		M	2800	mg/kg	0.10	0.54	0.46	0.54	< 0.10	< 0.10	< 0.10	< 0.10		

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:				24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:				1894224	1894225	1894226	1894227	1894228	1894229	1894230
		Client Sample ID.:				ES1TP01	ES1TP02	ES1TP03	ES1TP04	ES1TP05	ES1TP06	ES1TP07
		Sample Location:				TP01	TP02	TP03	TP04	TP05	TP06	TP07
		Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):				0.2	0.5	0.2	0.5	1	0.6	0.1
		Bottom Depth (m):				0.3	0.6	0.3	0.6	1.1	0.6	0.1
		Date Sampled:				08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024
		Time Sampled:				12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Pyrene		M	2800	mg/kg	0.10	0.40	0.37	0.48	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene		M	2800	mg/kg	0.10	0.39	0.35	0.30	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene		M	2800	mg/kg	0.10	0.43	0.42	0.38	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	0.50	0.55	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	0.15	0.20	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	0.36	0.37	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.31	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.31	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	3.1	3.8	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10	3.7	4.6	1.5	0.10	0.40	0.60	0.60

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:						24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:						1894231	1894232	1894233	1894234	1894235	1894236	1894237
		Client Sample ID.:						ES2TP07	ES1TP08	ES2TP08	ES1TP09	ES1TP10	ES1TP11	ES1TP12
		Sample Location:						TP07	TP08	TP08	TP09	TP10	TP11	TP12
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):						0.4	0.1	0.8	0.05	1.5	0.7	1
		Bottom Depth (m):						0.4	0.1	0.8	0.05	1.5	0.7	1
		Date Sampled:						08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:						DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
ACM Type		U	2192		N/A	Fibres/Clumps	-	-	-	-	-	-	-	-
Asbestos Identification		U	2192		N/A	Chrysotile	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry		U	2192	%	0.001	0.001								
Total Asbestos		U	2192	%	0.001	0.001								
Moisture		N	2030	%	0.020	15	7.5	21	24	21	22	21		
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	Roots, Stones and Wood	Stones	Roots	grass and Roots	None	Roots and Stones	Stones		
Soil Texture		N	2040		N/A	Loam	Sand	Clay	Loam	Clay	Clay	Clay	Clay	Clay
pH at 20C		M	2010		4.0	8.0	8.3	7.9	7.6	7.6	7.6	7.9		
pH (2.5:1) at 20C		N	2010		4.0	8.0								
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	1.2	0.58	< 0.40	0.41	< 0.40	< 0.40	< 0.40		
Magnesium (Water Soluble)		N	2120	g/l	0.010	< 0.010					< 0.010			
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.056					< 0.010			
Total Sulphur		U	2175	%	0.010	0.10					0.030			
Chloride (Water Soluble)		M	2220	g/l	0.010	< 0.010					< 0.010			
Nitrate (Water Soluble)		N	2220	g/l	0.010	< 0.010					< 0.010			
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ammonium (Water Soluble)		M	2220	g/l	0.01	< 0.01					< 0.01			
Sulphate (Acid Soluble)		U	2430	%	0.010	0.088	0.14	0.012	0.058	0.014	< 0.010	0.039		
Arsenic		M	2455	mg/kg	0.5	26	7.3	28	42	9.6	32	40		
Beryllium		U	2455	mg/kg	0.5	0.5	0.6	1.4	2.5	1.9	1.5	2.2		
Cadmium		M	2455	mg/kg	0.10	1.5	0.75	0.27	5.7	0.68	0.97	3.7		
Chromium		M	2455	mg/kg	0.5	20	10	30	37	20	34	36		
Mercury Low Level		N	2450	mg/kg	0.05	0.08	0.05	0.07	0.12	< 0.05	0.08	0.14		
Manganese		M	2455	mg/kg	1.0	930	420	450	1800	560	1100	1100		
Molybdenum		M	2455	mg/kg	0.5	1.6	1.2	2.8	9.9	1.3	3.8	5.5		
Antimony		N	2455	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0		
Copper		M	2455	mg/kg	0.50	20	11	25	23	17	28	33		
Nickel		M	2455	mg/kg	0.50	18	9.2	24	55	39	38	50		
Lead		M	2455	mg/kg	0.50	550	38	48	260	34	87	160		
Selenium		M	2455	mg/kg	0.25	1.3	0.88	1.1	8.8	1.9	2.8	3.3		
Zinc		M	2455	mg/kg	0.50	440	52	71	460	26	110	370		

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:				24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:				1894231	1894232	1894233	1894234	1894235	1894236	1894237
		Client Sample ID.:				ES2TP07	ES1TP08	ES2TP08	ES1TP09	ES1TP10	ES1TP11	ES1TP12
		Sample Location:				TP07	TP08	TP08	TP09	TP10	TP11	TP12
		Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):				0.4	0.1	0.8	0.05	1.5	0.7	1
		Bottom Depth (m):				0.4	0.1	0.8	0.05	1.5	0.7	1
		Date Sampled:				08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024
		Time Sampled:				12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Chromium (Trivalent)		N	2490	mg/kg	1.0	20	10	30	37	20	34	36
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	11	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	28	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	39	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	39	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	3.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	14	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	50	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	46	1.5	< 1.0	< 1.0	30	< 1.0	< 1.0
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	68	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	110	< 10	< 10	< 10	30	< 10	< 10
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	110	< 10	< 10	< 10	< 10	< 10	< 10
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	150	< 10	< 10	< 10	30	< 10	< 10
Naphthalene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:						24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:						1894231	1894232	1894233	1894234	1894235	1894236	1894237
		Client Sample ID.:						ES2TP07	ES1TP08	ES2TP08	ES1TP09	ES1TP10	ES1TP11	ES1TP12
		Sample Location:						TP07	TP08	TP08	TP09	TP10	TP11	TP12
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):						0.4	0.1	0.8	0.05	1.5	0.7	1
		Bottom Depth (m):						0.4	0.1	0.8	0.05	1.5	0.7	1
		Date Sampled:						08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:						DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10	0.90	0.60	0.30	0.60	0.90	0.50	0.30		

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.: 24-36973						24-36973	24-36973	24-36973	24-36973	24-36973	24-36973
Quotation No.:		Chemtest Sample ID.: 1894238						1894239	1894240	1894241	1894242	1894243	1894244
		Client Sample ID.: ES1TP13						ES1TP14	ES1TP15	ES1TP16	ES1TP17	ES1TP18	ES1TP19
		Sample Location: TP13						TP14	TP15	TP16	TP17	TP18	TP19
		Sample Type: SOIL						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m): 0.1						0.1	0.6	0.4	0.1	1.5	0.5
		Bottom Depth (m): 0.1						0.1	0.6	0.4	0.1	1.5	0.5
		Date Sampled: 08-Nov-2024						08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024
		Time Sampled: 12:00						12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab: DURHAM						DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD								
ACM Type		U	2192		N/A	-	-	-	-	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry		U	2192	%	0.001								
Total Asbestos		U	2192	%	0.001								
Moisture		N	2030	%	0.020	19	28	24	18	28	19	21	
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	grass	Stones and Roots	Roots and grass	Stones	Roots and Stones	None	Stones and Roots	
Soil Texture		N	2040		N/A	Loam	Loam	Clay	Loam	Loam	Clay	Loam	
pH at 20C		M	2010		4.0	7.3	6.7	7.3	7.7	6.5	7.8	6.9	
pH (2.5:1) at 20C		N	2010		4.0	7.4		7.3			7.7	7.2	
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	
Magnesium (Water Soluble)		N	2120	g/l	0.010	< 0.010		< 0.010			< 0.010	< 0.010	
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	< 0.010		< 0.010			< 0.010	< 0.010	
Total Sulphur		U	2175	%	0.010	0.040		0.020			0.020	0.040	
Chloride (Water Soluble)		M	2220	g/l	0.010	< 0.010		< 0.010			< 0.010	< 0.010	
Nitrate (Water Soluble)		N	2220	g/l	0.010	< 0.010		< 0.010			< 0.010	< 0.010	
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Ammonium (Water Soluble)		M	2220	g/l	0.01	< 0.01		< 0.01			< 0.01	< 0.01	
Sulphate (Acid Soluble)		U	2430	%	0.010	0.069	0.088	0.060	0.027	0.044	< 0.010	0.060	
Arsenic		M	2455	mg/kg	0.5	23	29	21	11	7.2	26	22	
Beryllium		U	2455	mg/kg	0.5	1.1	1.1	1.0	1.3	0.9	2.1	1.2	
Cadmium		M	2455	mg/kg	0.10	0.90	1.1	0.67	0.72	0.63	1.0	0.77	
Chromium		M	2455	mg/kg	0.5	28	36	21	20	11	34	34	
Mercury Low Level		N	2450	mg/kg	0.05	0.05	0.09	0.06	< 0.05	< 0.05	0.09	0.06	
Manganese		M	2455	mg/kg	1.0	1500	1400	860	1200	420	2000	1700	
Molybdenum		M	2455	mg/kg	0.5	2.9	2.7	2.7	2.3	1.1	3.0	4.7	
Antimony		N	2455	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	
Copper		M	2455	mg/kg	0.50	21	27	16	16	18	30	25	
Nickel		M	2455	mg/kg	0.50	25	25	21	24	7.8	64	29	
Lead		M	2455	mg/kg	0.50	90	99	53	31	25	32	73	
Selenium		M	2455	mg/kg	0.25	1.9	2.1	1.5	1.8	1.0	3.3	2.3	
Zinc		M	2455	mg/kg	0.50	280	170	230	57	49	100	250	

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.: 24-36973						24-36973	24-36973	24-36973	24-36973	24-36973	24-36973
Quotation No.:		Chemtest Sample ID.: 1894238						1894239	1894240	1894241	1894242	1894243	1894244
		Client Sample ID.: ES1TP13						ES1TP14	ES1TP15	ES1TP16	ES1TP17	ES1TP18	ES1TP19
		Sample Location: TP13						TP14	TP15	TP16	TP17	TP18	TP19
		Sample Type: SOIL						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m): 0.1						0.1	0.6	0.4	0.1	1.5	0.5
		Bottom Depth (m): 0.1						0.1	0.6	0.4	0.1	1.5	0.5
		Date Sampled: 08-Nov-2024						08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024
		Time Sampled: 12:00						12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab: DURHAM						DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD								
Chromium (Trivalent)		N	2490	mg/kg	1.0	28	36	21	20	11	34	34	
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	< 3.0	6.0	< 3.0	< 3.0	27	< 3.0	< 3.0	< 3.0
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	< 5.0	6.0	< 5.0	< 5.0	28	< 5.0	< 5.0	< 5.0
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	28	< 10	< 10	< 10
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	3.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	31	< 10	< 10	< 10
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	31	< 10	< 10	< 10
Naphthalene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:						24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:						1894238	1894239	1894240	1894241	1894242	1894243	1894244
		Client Sample ID.:						ES1TP13	ES1TP14	ES1TP15	ES1TP16	ES1TP17	ES1TP18	ES1TP19
		Sample Location:						TP13	TP14	TP15	TP16	TP17	TP18	TP19
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):						0.1	0.1	0.6	0.4	0.1	1.5	0.5
		Bottom Depth (m):						0.1	0.1	0.6	0.4	0.1	1.5	0.5
		Date Sampled:						08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:						DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10	0.20	0.20	0.20	0.20	0.20	0.40	0.70	0.70	0.70

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:						24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:						1894245	1894246	1894247	1894248	1894249	1894250	1894251
		Client Sample ID.:						ES1TP20	ES1TP21	ES1TP22	ES1TP23	ES1TP24	ES1TP25	ES1TP28
		Sample Location:						TP20	TP21	TP22	TP23	TP24	TP25	TP28
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):						0.8	0.1	0.4	0.5	0.9	0.6	0.05
		Bottom Depth (m):						0.8	0.1	0.4	0.5	0.9	0.6	0.05
		Date Sampled:						08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:						DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
ACM Type		U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry		U	2192	%	0.001									
Total Asbestos		U	2192	%	0.001									
Moisture		N	2030	%	0.020	28	27	21	14	15	20	30		
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Black		
Other Material		N	2040		N/A	Roots, Stones and grass	Stones, Roots and grass	Roots	Stones	Stones and grass	Roots	Roots		
Soil Texture		N	2040		N/A	Clay	Loam	Clay	Clay	Loam	Clay	Loam		
pH at 20C		M	2010		4.0	7.7	6.9	7.8	7.4	7.5	7.8	6.8		
pH (2.5:1) at 20C		N	2010		4.0					7.3				
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	< 0.40	0.44	0.48	< 0.40	< 0.40	< 0.40	< 0.40		
Magnesium (Water Soluble)		N	2120	g/l	0.010					< 0.010				
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010					< 0.010				
Total Sulphur		U	2175	%	0.010					0.020				
Chloride (Water Soluble)		M	2220	g/l	0.010					< 0.010				
Nitrate (Water Soluble)		N	2220	g/l	0.010					< 0.010				
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
Ammonium (Water Soluble)		M	2220	g/l	0.01					< 0.01				
Sulphate (Acid Soluble)		U	2430	%	0.010	0.010	0.085	0.048	< 0.010	0.014	0.030	0.094		
Arsenic		M	2455	mg/kg	0.5	8.5	22	24	15	19	27	14		
Beryllium		U	2455	mg/kg	0.5	1.1	1.4	0.8	1.3	1.5	1.4	0.6		
Cadmium		M	2455	mg/kg	0.10	1.4	0.90	0.37	0.44	0.58	0.85	0.46		
Chromium		M	2455	mg/kg	0.5	17	40	26	24	40	33	23		
Mercury Low Level		N	2450	mg/kg	0.05	0.05	0.08	0.05	0.06	0.06	0.06	< 0.05		
Manganese		M	2455	mg/kg	1.0	730	1400	510	1700	1900	630	880		
Molybdenum		M	2455	mg/kg	0.5	1.6	2.4	2.3	3.2	3.2	3.5	1.5		
Antimony		N	2455	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0		
Copper		M	2455	mg/kg	0.50	14	24	21	20	24	27	17		
Nickel		M	2455	mg/kg	0.50	29	33	28	33	40	39	16		
Lead		M	2455	mg/kg	0.50	30	57	67	32	35	91	50		
Selenium		M	2455	mg/kg	0.25	2.7	2.1	1.4	2.0	2.2	2.5	1.1		
Zinc		M	2455	mg/kg	0.50	290	150	340	100	110	640	130		

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:				24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:				1894245	1894246	1894247	1894248	1894249	1894250	1894251
		Client Sample ID.:				ES1TP20	ES1TP21	ES1TP22	ES1TP23	ES1TP24	ES1TP25	ES1TP28
		Sample Location:				TP20	TP21	TP22	TP23	TP24	TP25	TP28
		Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):				0.8	0.1	0.4	0.5	0.9	0.6	0.05
		Bottom Depth (m):				0.8	0.1	0.4	0.5	0.9	0.6	0.05
		Date Sampled:				08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024
		Time Sampled:				12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Chromium (Trivalent)		N	2490	mg/kg	1.0	17	40	26	24	40	33	23
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	< 3.0	3.6	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.27	< 0.10
Anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.14	< 0.10
Fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.50	< 0.10

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:		24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:		1894245	1894246	1894247	1894248	1894249	1894250	1894251	
		Client Sample ID.:		ES1TP20	ES1TP21	ES1TP22	ES1TP23	ES1TP24	ES1TP25	ES1TP28	
		Sample Location:		TP20	TP21	TP22	TP23	TP24	TP25	TP28	
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
		Top Depth (m):		0.8	0.1	0.4	0.5	0.9	0.6	0.05	
		Bottom Depth (m):		0.8	0.1	0.4	0.5	0.9	0.6	0.05	
		Date Sampled:		08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	08-Nov-2024	
		Time Sampled:		12:00	12:00	12:00	12:00	12:00	12:00	12:00	
		Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	
Determinand	HWOL Code	Accred.	SOP	Units	LOD						
Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.34	< 0.10
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10	0.50	1.0	1.0	0.10	0.50	0.90

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:				24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:				1894252	1894253
		Client Sample ID.:				SP1ES1	SP2ES1
		Sample Location:				SP1	SP2
		Sample Type:				SOIL	SOIL
		Top Depth (m):				0.1	0.1
		Bottom Depth (m):				0.1	0.1
		Date Sampled:				08-Nov-2024	08-Nov-2024
		Time Sampled:				12:00	12:00
		Asbestos Lab:				DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
ACM Type		U	2192		N/A	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry		U	2192	%	0.001		
Total Asbestos		U	2192	%	0.001		
Moisture		N	2030	%	0.020	12	13
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Stones, Roots and Wood	Stones and Roots
Soil Texture		N	2040		N/A	Loam	Loam
pH at 20C		M	2010		4.0	8.6	8.2
pH (2.5:1) at 20C		N	2010		4.0		
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	0.78	0.41
Magnesium (Water Soluble)		N	2120	g/l	0.010		
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010		
Total Sulphur		U	2175	%	0.010		
Chloride (Water Soluble)		M	2220	g/l	0.010		
Nitrate (Water Soluble)		N	2220	g/l	0.010		
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Ammonium (Water Soluble)		M	2220	g/l	0.01		
Sulphate (Acid Soluble)		U	2430	%	0.010	0.079	0.099
Arsenic		M	2455	mg/kg	0.5	13	22
Beryllium		U	2455	mg/kg	0.5	0.8	1.2
Cadmium		M	2455	mg/kg	0.10	0.96	0.50
Chromium		M	2455	mg/kg	0.5	20	25
Mercury Low Level		N	2450	mg/kg	0.05	0.07	0.12
Manganese		M	2455	mg/kg	1.0	840	970
Molybdenum		M	2455	mg/kg	0.5	1.3	2.6
Antimony		N	2455	mg/kg	2.0	< 2.0	< 2.0
Copper		M	2455	mg/kg	0.50	18	53
Nickel		M	2455	mg/kg	0.50	18	31
Lead		M	2455	mg/kg	0.50	120	110
Selenium		M	2455	mg/kg	0.25	0.94	1.2
Zinc		M	2455	mg/kg	0.50	160	170

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:				24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:				1894252	1894253
		Client Sample ID.:				SP1ES1	SP2ES1
		Sample Location:				SP1	SP2
		Sample Type:				SOIL	SOIL
		Top Depth (m):				0.1	0.1
		Bottom Depth (m):				0.1	0.1
		Date Sampled:				08-Nov-2024	08-Nov-2024
		Time Sampled:				12:00	12:00
		Asbestos Lab:				DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Chromium (Trivalent)		N	2490	mg/kg	1.0	20	25
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	0.17
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	4.4	< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	22	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	8.0	< 3.0
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	34	< 5.0
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	34	< 10
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0	< 2.0
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0	8.2
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	< 1.0	< 1.0
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	< 5.0	10
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	< 10	10
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	35	10
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	35	10
Naphthalene		M	2800	mg/kg	0.10	< 0.10	0.24
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	0.33
Acenaphthene		M	2800	mg/kg	0.10	0.22	0.51
Fluorene		M	2800	mg/kg	0.10	0.18	0.65
Phenanthrene		M	2800	mg/kg	0.10	0.95	4.0
Anthracene		M	2800	mg/kg	0.10	0.27	1.8
Fluoranthene		M	2800	mg/kg	0.10	1.6	10

Results - Soil

Project: Bridgend

Client: Terra Firma		Chemtest Job No.:				24-36973	24-36973
Quotation No.:		Chemtest Sample ID.:				1894252	1894253
		Client Sample ID.:				SP1ES1	SP2ES1
		Sample Location:				SP1	SP2
		Sample Type:				SOIL	SOIL
		Top Depth (m):				0.1	0.1
		Bottom Depth (m):				0.1	0.1
		Date Sampled:				08-Nov-2024	08-Nov-2024
		Time Sampled:				12:00	12:00
		Asbestos Lab:				DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Pyrene		M	2800	mg/kg	0.10	1.1	7.5
Benzo[a]anthracene		M	2800	mg/kg	0.10	0.99	8.9
Chrysene		M	2800	mg/kg	0.10	0.78	9.7
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	1.5	15
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	0.50	4.6
Benzo[a]pyrene		M	2800	mg/kg	0.10	1.2	12
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	0.80	8.2
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	0.24	2.1
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	0.69	6.7
Total Of 16 PAH's		N	2800	mg/kg	2.0	11	92
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10	0.20	0.50

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.	
2300	Cyanides & Thiocyanate in Soils	Free (or easily liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

- DW - Drinking Water
- GW - Ground Water
- LE - Land Leachate
- NA - Not Applicable

Report Information

PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

ANNEX D
CBR Test Results



DYNAMIC CONE PENETROMETER TEST



Site Name: Craog-y-Parcau

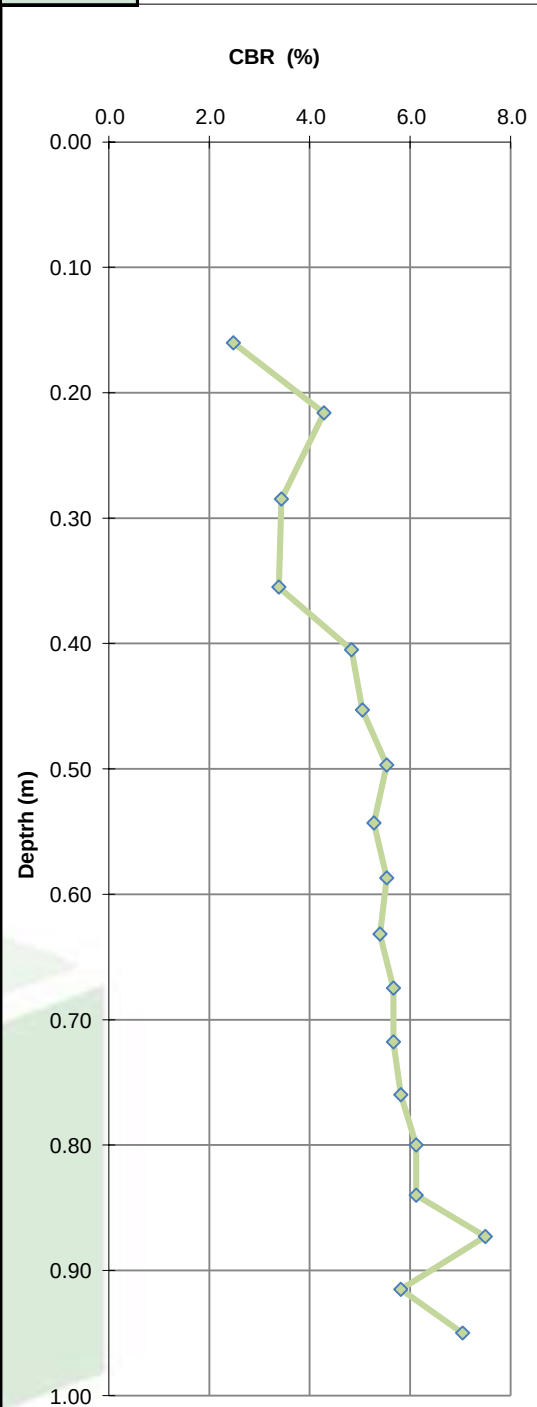
Project Number: TF-24-589-CA

Date: 11/11/2024

Engineer: Elliot

Test:

TRL01

[illegible]

REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

DYNAMIC CONE PENETROMETER TEST



Site Name: Craog-y-Parcau

Project Number: TF-24-589-CA

Date: 11/11/2024

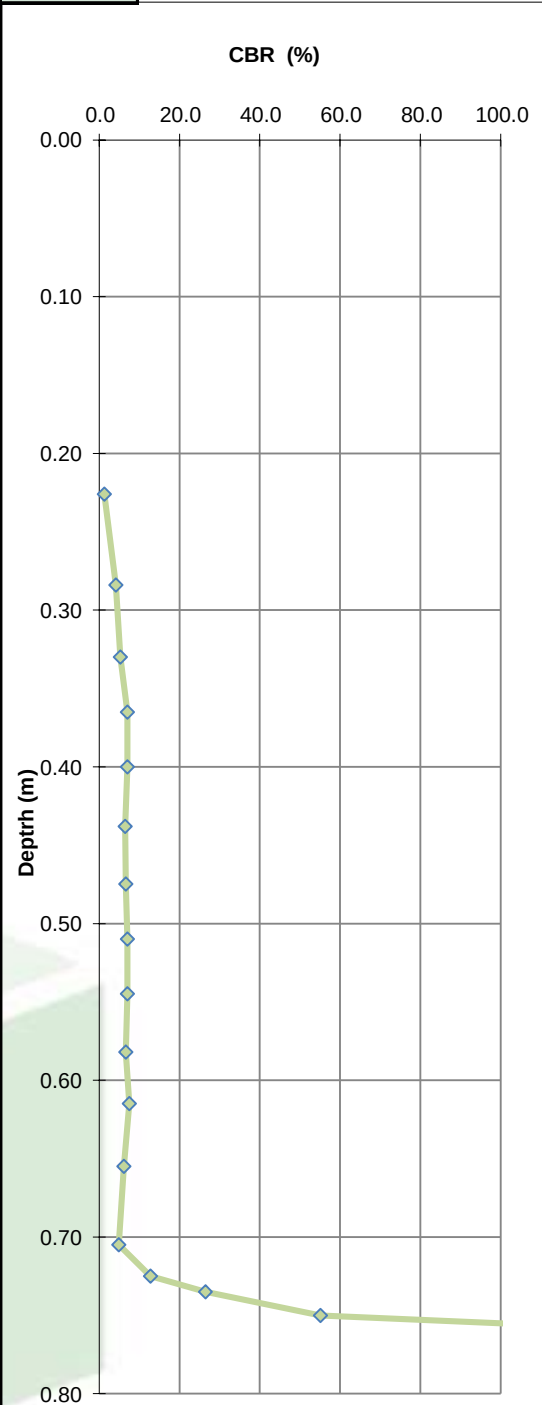
Engineer: Elliot

Test:

TRL02

Initial Scale Reading (mm) 55 Datum bgl (mm) 0

No. of blows	Scale reading (mm)	Penetration increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	226	171	0.23	171	1.3
1	284	58	0.28	58	4.1
1	330	46	0.33	46	5.3
1	365	35	0.37	35	7.0
1	400	35	0.40	35	7.0
1	438	38	0.44	38	6.5
1	475	37	0.48	37	6.6
1	510	35	0.51	35	7.0
1	545	35	0.55	35	7.0
1	582	37	0.58	37	6.6
1	615	33	0.62	33	7.5
1	655	40	0.66	40	6.1
1	705	50	0.71	50	4.8
1	725	20	0.73	20	12.7
1	735	10	0.74	10	26.5
3	750	15	0.75	5	55.1
5	760	10	0.76	2	145.1



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

DYNAMIC CONE PENETROMETER TEST



Site Name: Craog-y-Parcau

Project Number: TF-24-589-CA

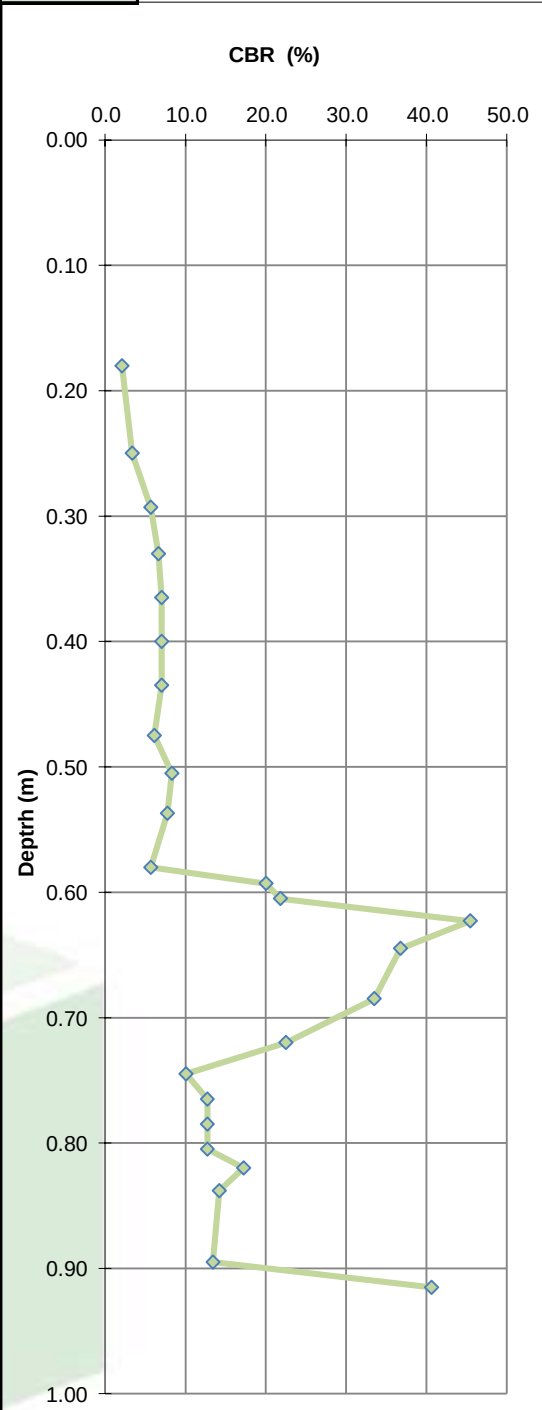
Date: 11/11/2024

Engineer: Elliot

Test:

TRL03

Initial Scale Reading (mm)	70	Datum bgl (mm)	0
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[illegible]

REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

DYNAMIC CONE PENETROMETER TEST



Site Name: Craog-y-Parcau

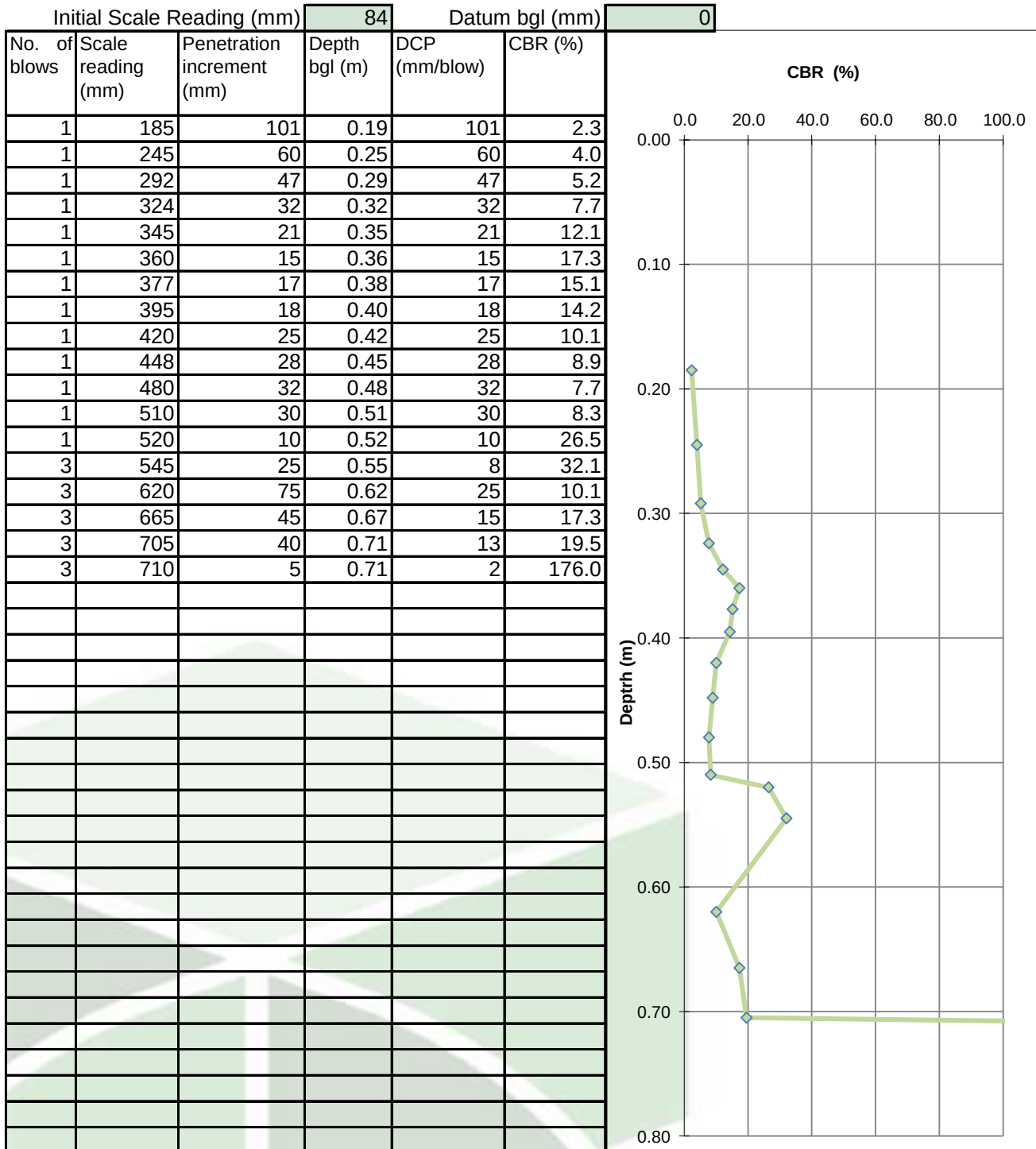
Project Number: TF-24-589-CA

Date: 11/11/2024

Engineer: Elliot

Test:

TRL04



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

DYNAMIC CONE PENETROMETER TEST

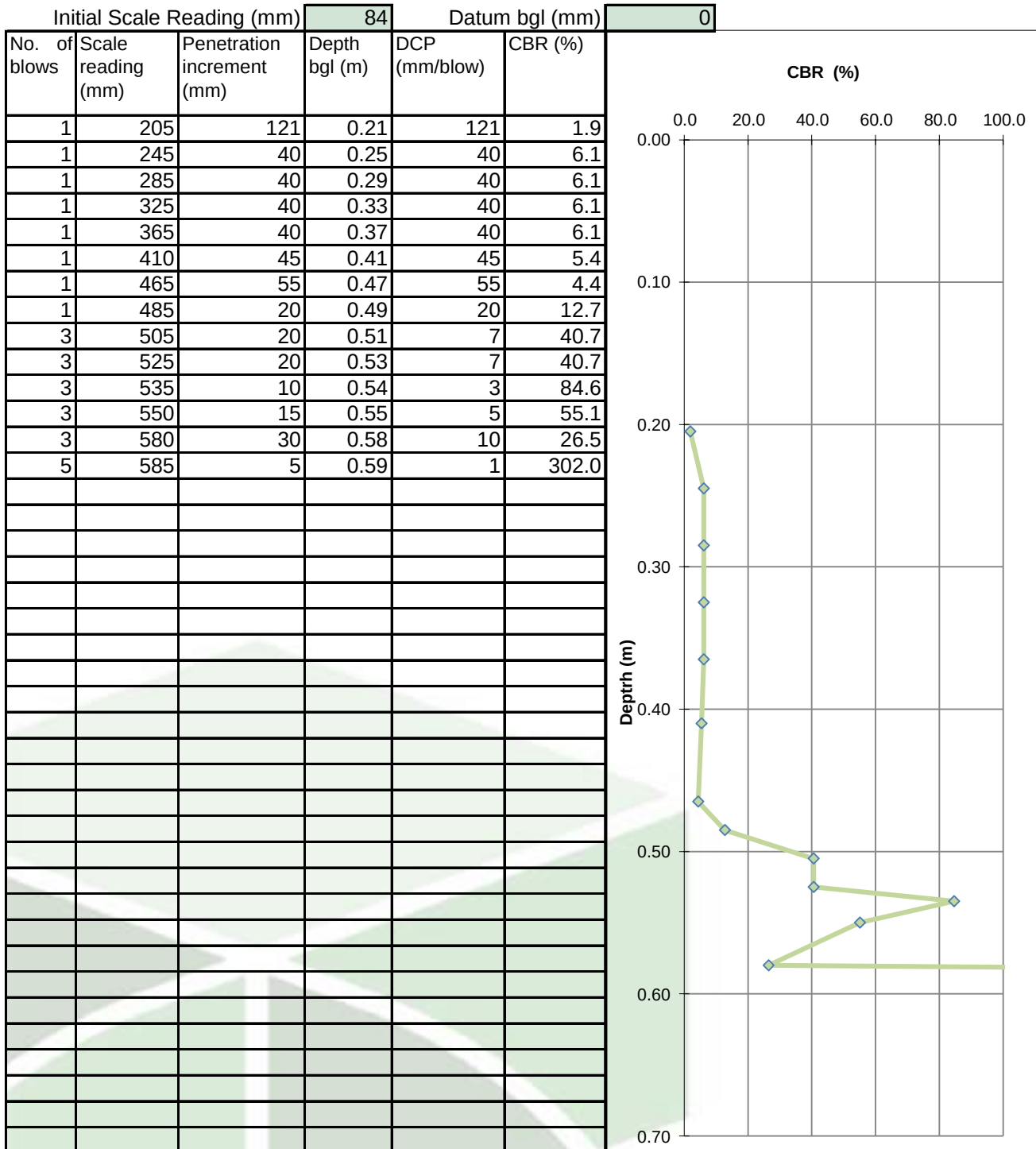


Site Name: Craog-y-Parcau

Project Number: TF-24-589-CA

Date: 11/11/2024

Engineer: Elliot

Test: **TRL05**

REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

DYNAMIC CONE PENETROMETER TEST



Site Name: Craog-y-Parcau

Project Number: TF-24-589-CA

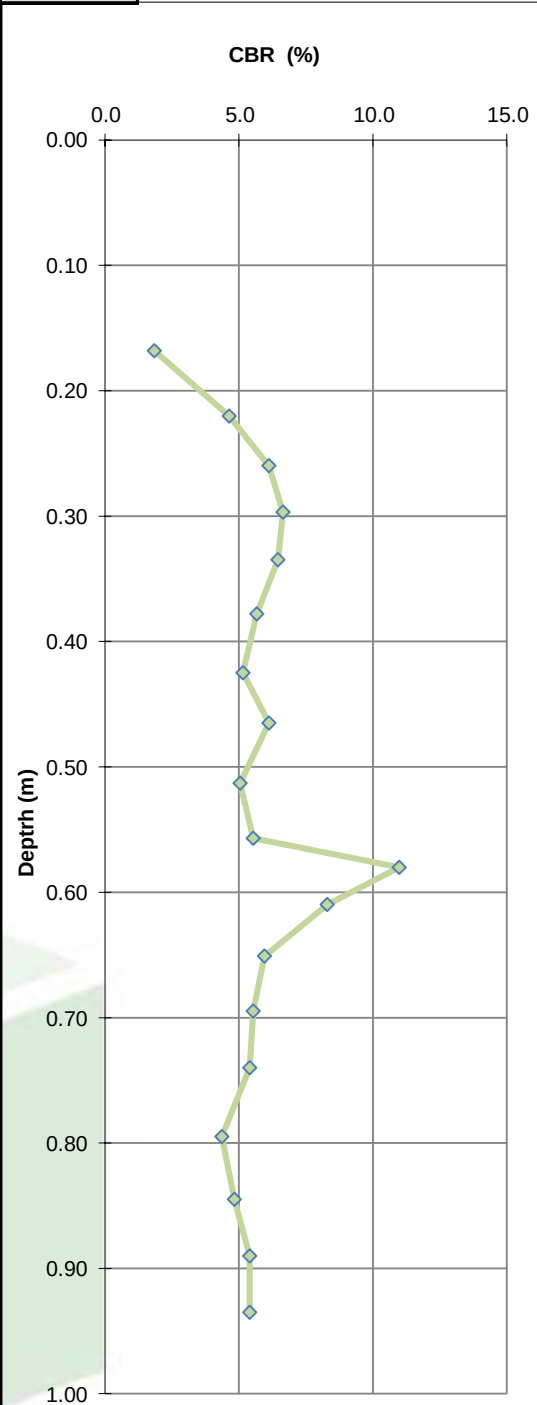
Date: 11/11/2024

Engineer: Elliot

Test:

TRL06

Initial Scale Reading (mm) 43 Datum bgl (mm) 0

[illegible]

REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

DYNAMIC CONE PENETROMETER TEST



Site Name: Craog-y-Parcau

Project Number: TF-24-589-CA

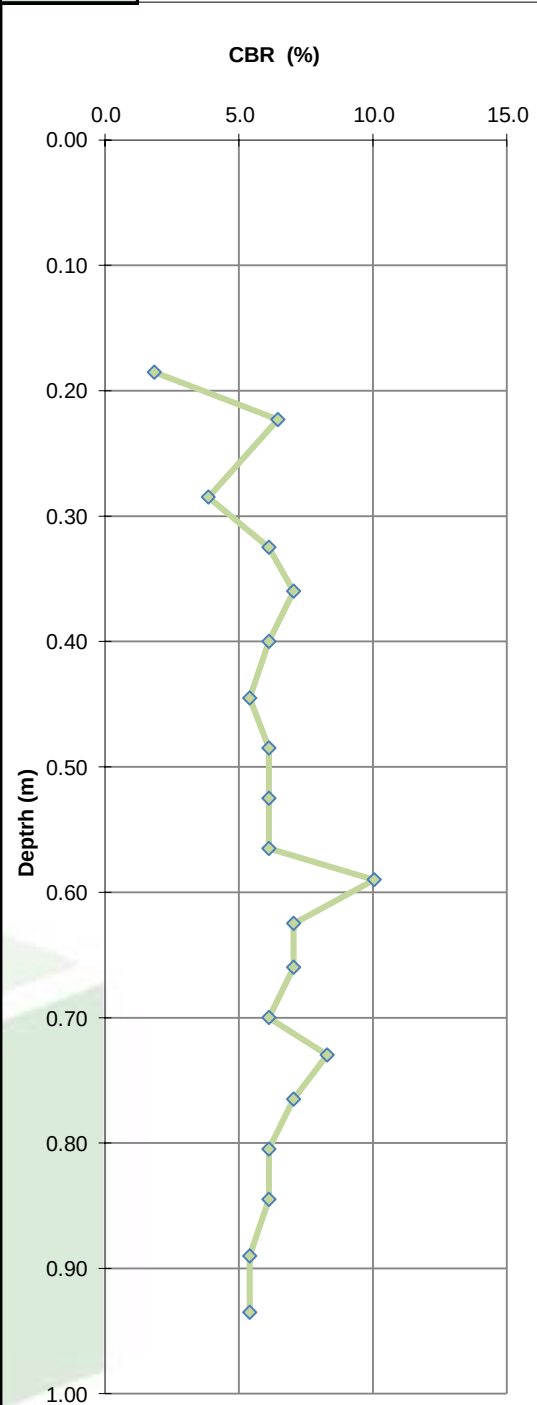
Date: 11/11/2024

Engineer: Elliot

Test:

TRL07

Initial Scale Reading (mm) 60 Datum bgl (mm) 0

[illegible]

REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

DYNAMIC CONE PENETROMETER TEST

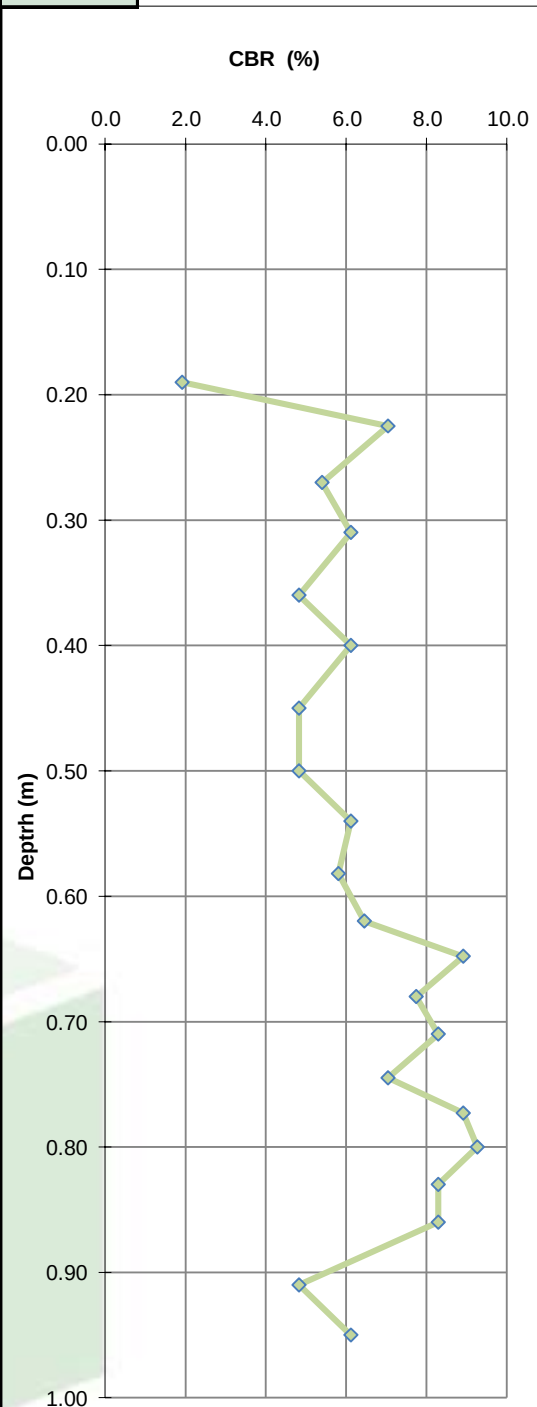


Site Name: Craog-y-Parcau

Project Number: TF-24-589-CA

Date: 11/11/2024

Engineer: Elliot

Test: **TRL08**[illegible]

REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

DYNAMIC CONE PENETROMETER TEST



Site Name: Craog-y-Parcau

Project Number: TF-24-589-CA

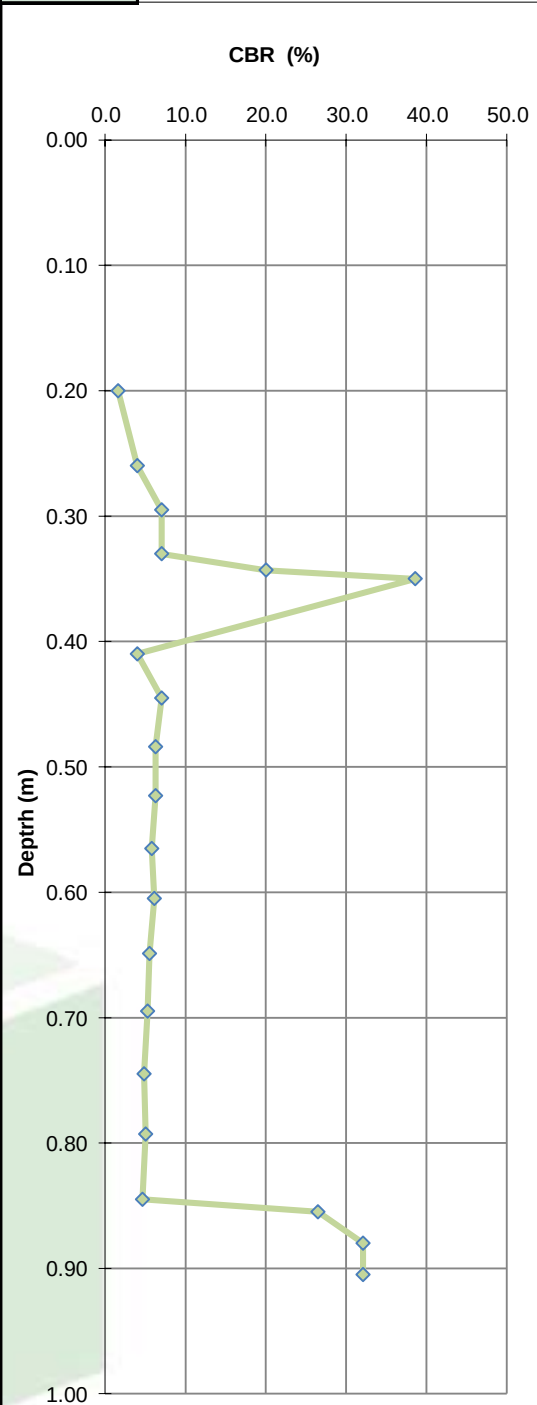
Date: 11/11/2024

Engineer: Elliot

Test:

TRL09

Initial Scale Reading (mm)	60	Datum bgl (mm)	0
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[illegible]

REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

DYNAMIC CONE PENETROMETER TEST



Site Name: Craog-y-Parcau

Project Number: TF-24-589-CA

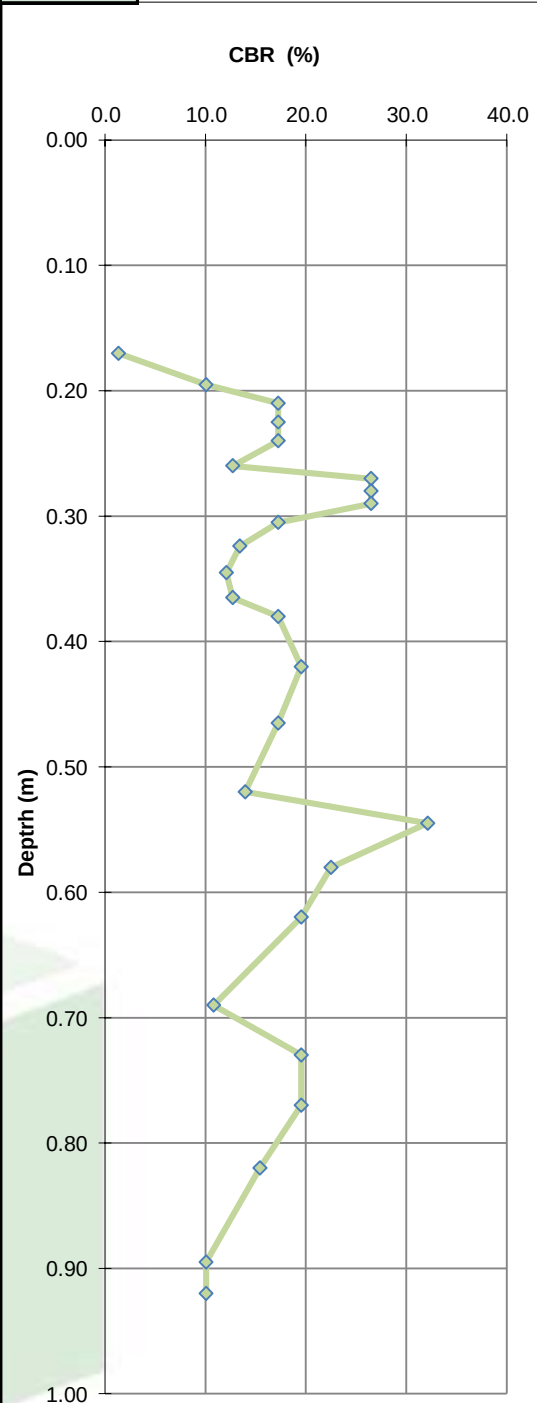
Date: 11/11/2024

Engineer: Elliot

Test:

TRL10

Initial Scale Reading (mm)	70	Datum bgl (mm)	0
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[illegible]

REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

DYNAMIC CONE PENETROMETER TEST

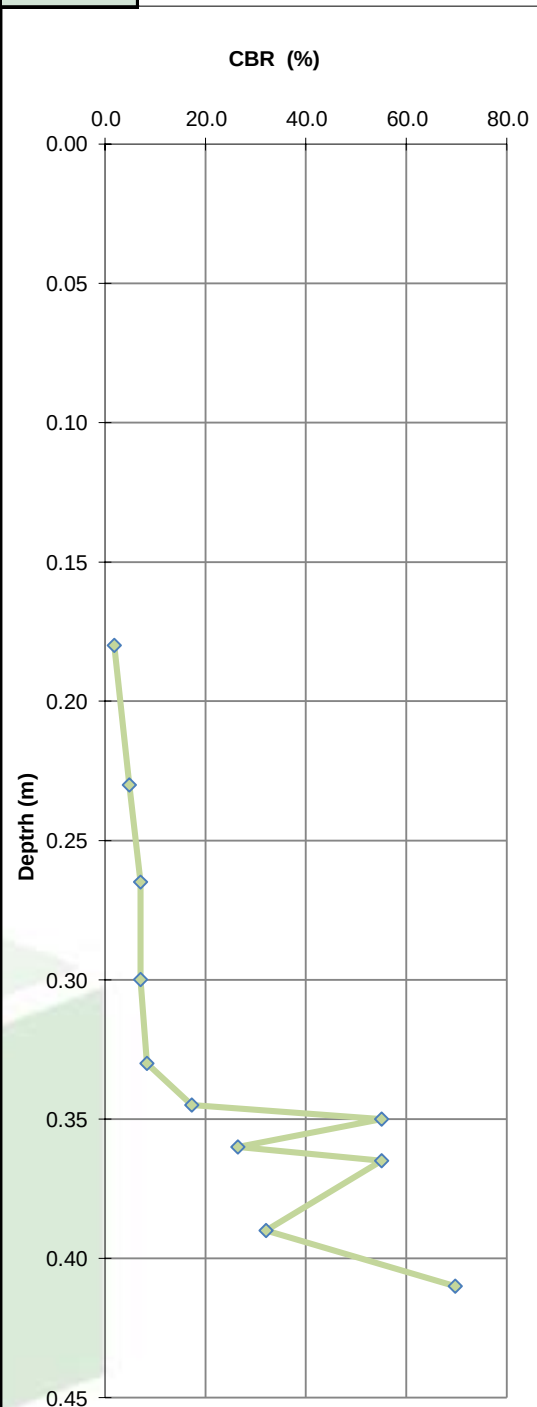


Site Name: Craog-y-Parcau

Project Number: TF-24-589-CA

Date: 11/11/2024

Engineer: Elliot

Test: **TRL11**[illegible]

REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

ANNEX E
Laboratory Geotechnical Test Results





Results Summary

Apex Testing Solutions Limited

Sturmi Way
Village Farm Industrial Estate
Pyle
Bridgend
CF33 6BZ

Telephone: 01656 746762

E-mail: andrew.grogan@apex-drilling.com

laura.davis@apex-drilling.com

<u>Reporting Details</u>		<u>Key Information</u>	
Company Name:	TFW Group Ltd	Site Name:	Bridgend
Address:	5 Deryn Court Wharfdale Road Cardiff CF23 7HA	Job Number:	D24428
Contact Name:	Elliot	Date Received:	12/11/2024
Contact Number:		Job Coordinator:	L. Davis

Item No.	Tests Undertaken	Number of Tests
1	Water Content - ISO 17892 2014	15
2	Atterburg Limits (4 point) - BS1377-2: 1990	15

Results Issued: 28/11/2024

Comments

Results herein relate only to samples received in the laboratory and where not sampled by Apex Testing Solutions personnel relate to the samples as received.

Where tests are UKAS accredited any Opinion and/or Interpretation expressed herein are outside the scope of the UKAS Accreditation. The reports shall not be reproduced in full without the written approval of the laboratory.

Please contact the job coordinator should any further information be required.

TEST REPORT

Determination Of Water Content

ISO 17892-1: 2014 +A1:2022

Project No: D24427

Project Name: 24-589-CA - Bridgend

Client: TFW Group Ltd

Address: 5 Deryn Court
Wharfdale Road
Cardiff
CF23 7HA

ATS Sample No: 38548

Site Ref / Hole ID: TP01

Sample No:

**Sampling Certificate
Received:** No

Depth (m): 0.60

Sample Type: Disturbed

Material Description: Light brown slightly
gravelly CLAY

Location in Works: N/a

Material Source: Ex-Site

Date Sampled: Unknown

Material Supplier: Ex-Site

Sampled By: Client

Specification: ISO 17892-1

Date Received: 12 November 2024

Date Tested: 26 November 2024

Test Results

Water Content (%)

34.2

Remarks:

QA Ref.

EN ISO 17892-
1:2014 +A1:2022



Apex Testing Solutions

Sturmi Way, Village Farm Industrial Est,
Pyle, Bridgend, CF33 6BZ

Tel: 01656 746762 Fax: 01656 749096



7771

Approver

L Davis

Date

27/11/2024

Fig

MC

L Davis, Quality Manager

TEST REPORT
LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

Project No: D24427
Project Name: 24-589-CA - Bridgend

ATS Sample No: 38548

Client: TFW Group Ltd
Address: 5 Deryn Court
Wharfdale Road
Cardiff
CF23 7HA

Site Ref / Hole ID: TP01

Depth (m): 0.60

Sample No:

Sample Type: Disturbed

Sampling Certificate Received: No

Material Description: Light brown slightly gravelly CLAY

Location in Works: N/a

Material Source: Ex-Site

Date Sampled: Unknown

Material Supplier: Ex-Site

Sampled By: Client

Specification: BS1377

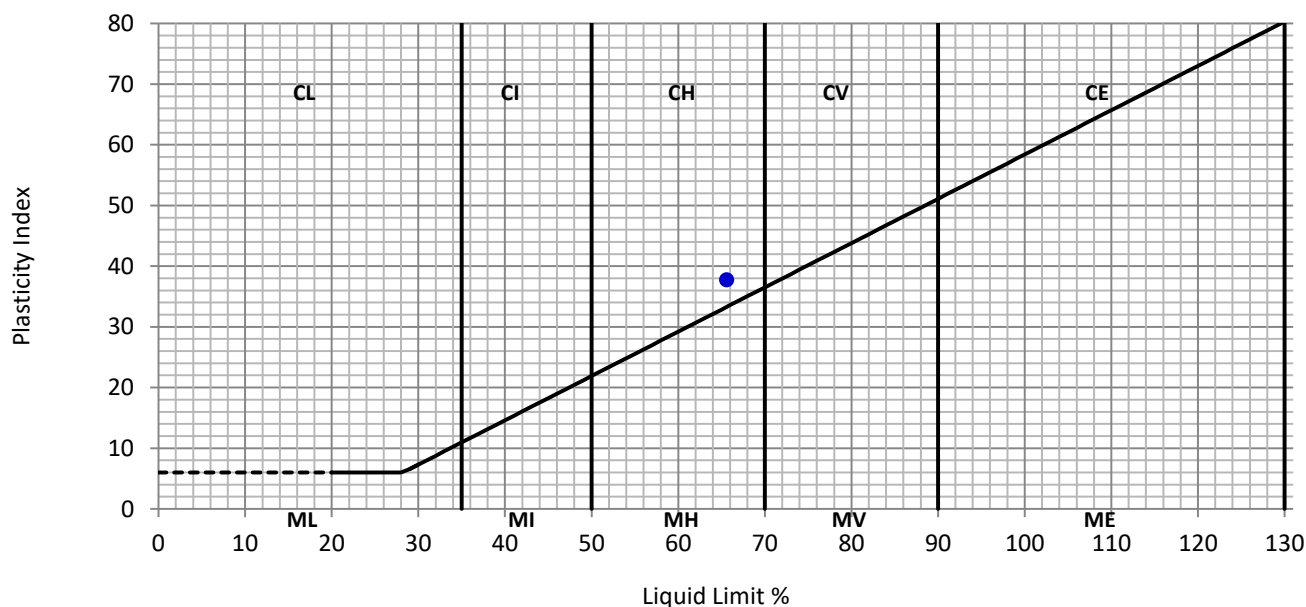
Date Received: 12 November 2024

Date Tested: 26 November 2024

Test Results

Liquid Limit	66	%
Plastic Limit	28	%
Plasticity Index	38	%

Preparation:	4.2.3 Natural Specimen
Proportion retained on 425µm sieve:	2 %



Remarks:

QA Ref.

BS1377 - 2
Rev. 3.0



Apex Testing Solutions

Sturmi Way, Village Farm Industrial Est, Pyle,
Bridgend, CF33 6BZ
Tel: 01656 746762 Fax: 01656 749096



7771

Approver

L Davis

L Davis, Quality Manager

Date

27/11/2024

Fig.

ATT

TEST REPORT

Determination Of Water Content

ISO 17892-1: 2014 +A1:2022

Project No: D24427

Project Name: 24-589-CA - Bridgend

Client: TFW Group Ltd

Address: 5 Deryn Court
Wharfdale Road
Cardiff
CF23 7HA

ATS Sample No: 38549

Site Ref / Hole ID: TP03

Sample No:

**Sampling Certificate
Received:** No

Depth (m): 0.90 - 1.00

Sample Type: Disturbed

Material Description: Brown CLAY

Location in Works: N/a

Material Source: Ex-Site

Date Sampled: Unknown

Material Supplier: Ex-Site

Sampled By: Client

Specification: ISO 17892-1

Date Received: 12 November 2024

Date Tested: 25 November 2024

Test Results

Water Content (%)

31.5

Remarks:

QA Ref.

EN ISO 17892-
1:2014 +A1:2022



Apex Testing Solutions

Sturmi Way, Village Farm Industrial Est,
Pyle, Bridgend, CF33 6BZ

Tel: 01656 746762 Fax: 01656 749096



7771

Approver

L Davis

Date

26/11/2024

L Davis, Quality Manager

Fig

MC

TEST REPORT																	
LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX																	
BS 1377:Part 2:1990. Clause 4.3/5.3/5.4																	
Project No: D24427		Client: TFW Group Ltd															
Project Name: 24-589-CA - Bridgend		Address: 5 Deryn Court															
		Wharfdale Road															
		Cardiff															
ATS Sample No: 38549		CF23 7HA															
Site Ref / Hole ID: TP03		Depth (m): 0.90 - 1.00															
Sample No:		Sample Type: Disturbed															
Sampling Certificate Received: No		Material Description: Brown CLAY															
Location in Works: N/a		Material Source: Ex-Site															
Date Sampled: Unknown		Material Supplier: Ex-Site															
Sampled By: Client		Specification: BS1377															
Date Received: 12 November 2024		Date Tested: 22 November 2024															
Test Results																	
<table><tr><td>Liquid Limit</td><td>68</td><td>%</td></tr><tr><td>Plastic Limit</td><td>22</td><td>%</td></tr><tr><td>Plasticity Index</td><td>46</td><td>%</td></tr></table>		Liquid Limit	68	%	Plastic Limit	22	%	Plasticity Index	46	%	<table><tr><td>Preparation:</td><td>4.2.3 Natural Specimen</td></tr><tr><td>Proportion retained on 425µm sieve:</td><td>0 %</td></tr></table>			Preparation:	4.2.3 Natural Specimen	Proportion retained on 425µm sieve:	0 %
Liquid Limit	68	%															
Plastic Limit	22	%															
Plasticity Index	46	%															
Preparation:	4.2.3 Natural Specimen																
Proportion retained on 425µm sieve:	0 %																
Remarks:																	
QA Ref.			Approver	Date													
BS1377 - 2 Rev. 3.0	Apex Testing Solutions Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096		<i>L Davis</i>	26/11/2024													
			Fig.														
		7771	ATT														
		L Davis, Quality Manager															

TEST REPORT

Determination Of Water Content

ISO 17892-1: 2014 +A1:2022

Project No: D24427
Project Name: 24-589-CA - Bridgend

Client: TFW Group Ltd
Address: 5 Deryn Court
Wharfdale Road
Cardiff
CF23 7HA

ATS Sample No: 38550

Site Ref / Hole ID: TP04

Sample No:

**Sampling Certificate
Received:** No

Location in Works: N/a

Date Sampled: Unknown

Sampled By: Client

Date Received: 12 November 2024

Depth (m): 1.40 -

Sample Type: Disturbed

Material Description: Light brown slightly
sandy slughtly gravelly
CLAY

Material Source: Ex-Site

Material Supplier: Ex-Site

Specification: ISO 17892-1

Date Tested: 26 November 2024

Test Results

Water Content (%)

22.8

Remarks:

QA Ref.

EN ISO 17892-
1:2014 +A1:2022



Apex Testing Solutions

Sturmi Way, Village Farm Industrial Est,
Pyle, Bridgend, CF33 6BZ

Tel: 01656 746762 Fax: 01656 749096



7771

Approver

L Davis

Date

28/11/2024

L Davis, Quality Manager

Fig

MC