



INVESTIGATE



REMEDiate



REGENERATE



FINAL VERIFICATION REPORT

FOR
PLOTS 2 - 8,
LAUND ROAD,
SALENDINE NOOK,
HUDDERSFIELD,

PREPARED FOR
CREATIVE DEVELOPMENTS
(HUDDERSFIELD) LIMITED

REPORT NO. NE3941G
MARCH 2023

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**VERIFICATION OF TOPSOIL COVER SYSTEMS AND HARD SURFACING FOR
PLOTS 2 TO 8, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD**

CLIENT: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED

ARCHITECT: NORTHERN DESIGN PARTNERSHIP

1. INTRODUCTION

This report has been prepared in accordance with an email dated 13th February 2023 from the Client.

The brief was set out in our estimates, E6654B and dated 22nd June 2020, and ref. E6654C and dated 22nd June 2020, and includes:

- Site visits to inspect and photograph the topsoil cover systems and hard paving installed at Plots 2 to 8
- Site visits to inspect the gas protection measures installed at Plots 2 to 4*
- Topsoil verification analyses
- Provision of a verification report on the above.

It should be noted that tracer gas testing to prove the efficacy of the membrane installed at Plot 2, and verification of gas protection installed in Plots 5 to 8 has been undertaken by MEC Environmental Limited and the findings are detailed in their Verification Report dated 14th February 2023.

The following reports have previously been issued for this site and should be read in conjunction with this Verification Report:

- Phase I Desk Study Reference: A0697/17, November 2017 undertaken by Earth Environmental & Geotechnical Ltd (EEG)
- Phase II Ground Investigation Reference: A0697/17, October 2019 undertaken by Earth, Environmental & Geotechnical Ltd (EEG)
- Addendum Phase II Investigation Reference: A0697/20, January 2020 undertaken by Earth Environmental & Geotechnical Ltd (EEG)

This Final Verification Report relates to the full site (Plots 2 to 8) and incorporates the findings of the following verification reports previously issued for the individual plots:

- Verification Report for Plot 2, Ref. NE3941-2, dated January 2022
- Verification Report for Plot 3, Ref. NE3941-3, dated December 2021
- Verification Report for Plot 4, Ref. NE3941-4, dated November 2021
- Verification Report for Plot 5, Ref. NE3941-5, dated July 2022
- Verification Report for Plot 6, Ref. NE3941-6, dated July 2022
- Verification Report for Plot 7, Ref. NE3941-7, dated June 2022
- Verification Report for Plot 8, Ref. NE3941-8, dated June 2022

1.1 Site Location and Description

The site is located off Laund Road to the northwest of Huddersfield town centre. The site is roughly L-shaped with maximum approximate dimensions of 70m by 30m. The National Grid Reference for the centre of the site is 410385E,418278N.

NE3941F/8 Laund Road, Huddersfield

The site is accessed off Laund Road and is bound by open land with some houses to the north and east, by residential properties and gardens to the north west and along the southern side, and by Laund Road to the south west.

The site rises up from Laund Road to the main flat part of the site in its rear northern half, with the land beyond rising up further. Some retaining features are present along parts of the southern boundary and part is a sloping garden area, bordered by mature and semi mature trees and bushes.

1.2 Proposed Development & Purpose of the Verification Report

The site has been developed with the construction of residential housing with associated driveways and gardens as depicted on Figure 3.

The purpose of this Final Verification Report is to confirm that remedial measures relating to Plots 2 to 8 as set out in the Earth, Environmental & Geotechnical Ltd Reports Reference: A0697/17, October 2019 and A0697/20, January 2020 have been successfully implemented.

1.3 Development and Verification Timeline

The following paragraphs set out the timeline of the various verification aspects of the development. We understand that the ground gas protection aspects of Plots 5 to 8 were verified by a third party (MEC Environmental Limited).

Plots 2, 3 & 4

The gas membranes had been installed and inspected in Plot 2 in October 2020, in Plots 3 & 4 in July 2021. The buildings were constructed and hard paving to the front and topsoil cover systems to the rear were installed in all three Plots by August 2021.

Verification reports for Plots 2, 3 & 4 were issued in January 2022, December 2021, and November 2021 respectively.

Plots 7 and 8

The buildings of Plots 7 and 8 were constructed, the hard paving was installed to the front of both plots and to the rear of Plot 8, and the topsoil cover system was installed to the rear garden of Plot 7 by February 2022.

Verification reports for Plots 7 and 8 were issued in June 2022.

Plots 5 and 6

The buildings of Plots 5 and 6 were constructed, the hard paving was installed to the front of both plots, and the topsoil cover system was installed to the rear gardens of both plots by June 2022.

Verification reports for Plots 5 and 6 were issued in July 2022.

Highway

The bottom section of the site had already been base coated with tarmac up to the sleeping policemen (past Plots 5/6) at the start of the project. The top section past the sleeping policeman was base coated once services were live in Plots 5 to 8. The highway was left as a base coat until the full site was complete and no more deliveries were expected. Top and Final coats of tarmac for the highway were completed in the first week of February 2023.

Overview photographs showing the completed development including the highway surfacing are appended.

2. COVER SYSTEM

2.1 Remediation Aims

EEG Report ref. A0697/17, dated October 2019 found that the near surface soil contains concentrations of contaminants in exceedance of assessment criteria values relevant to a residential end use with plant uptake. Contaminants in exceedance included a selection of heavy metals and polycyclic aromatic hydrocarbons (PAHs). Chrysotile and amosite asbestos was also identified in the near surface soil samples with relatively low quantification results of <0.001% to 0.007%. The EEG report concluded that the overall potential risk to residential end users is moderate, and that remediation is required to mitigate this risk.

2.2 Remediation Methodology

The remediation methodology adopted was as follows:

- Hard paving was installed on a minimum 150mm bed of compacted aggregate.
- OR
- Simple cover system comprising 600mm clean imported topsoil.

The options adopted for the front and rear of each plot are summarised in the following table.

TABLE 1 REMEDIATION METHODOLOGY PER PLOT.

Location	Front	Rear
Plot 2	Hard Paving	Topsoil Cover System
Plot 3	Hard Paving	Topsoil Cover System
Plot 4	Hard Paving	Topsoil Cover System
Plot 5	Hard Paving	Topsoil Cover System
Plot 6	Hard Paving	Topsoil Cover System
Plot 7	Hard Paving	Topsoil Cover System
Plot 8	Hard Paving	Hard Paving

In our professional opinion the adopted hard paving or topsoil cover system will provide adequate protection for the end users of the site.

2.3 Verification Site Visits

Sub Surface North East Limited made multiple visits to the site to inspect the hard surfacing and topsoil cover systems. Hand dug pits were taken out at the locations indicated on Figures 3, 5, 7, 9, 11, and 13 to check the minimum specified depth of topsoil had been achieved and the findings are summarised in the following table:

TABLE 2 SUMMARY OF COVER SYSTEM INSPECTION VISITS

Date	Location Inspected	Depth of Topsoil Cover in Rear Garden (mm)
25/08/2021	Plot 2	600
	Plot 3	600
	Plot 4	600
25/02/2022	Plot 7	610 - 780
	Plot 8	N/A (hard cover throughout)
22/06/2022	Plot 5	700
	Plot 6	680

Client supplied photographs detailing the installation and photographs taken by Sub Surface North East during the site visits are appended

2.4 Source Verification Analyses

The topsoil used in the cover system appeared to be from a natural source and was provided by Darrington Quarries via Green Tech Limited. Delivery notes for the imported material are appended.

The contact details of the supplier are as follows:

Green Tech Limited
Rabbit Hill Business Park
Great North Road
Arkendale
HG5 0FF

Seven samples in total of imported topsoil were subjected to the following suite of verification analyses by an MCERTS and UKAS accredited laboratory (Chemtest Limited):

Arsenic	Nickel
Asbestos	pH
Boron	Phenols
Cadmium	Polynuclear Aromatic Hydrocarbons (16 EPA PAH)
Chromium	Selenium
Copper	Sulphide
Cyanide	Sulphate
Lead	Total Petroleum Hydrocarbons (3-BAND SPECIATION)
Mercury	Zinc

We understand that some 183 tonnes of soil was imported for use across the site giving a sampling frequency of approximately one sample per 18 m³ of material, which exceeds the recommended minimum density of one sample every 100m³ for a recycled source and one sample every 250m³ for a greenfield source as recommended in YAHPAC 'Verification Requirements for Cover Systems' (2013).

The results of the analyses were compared with generic assessment criteria (GACs) for a residential end use with homegrown produce and no elevated contaminants were found. The GACs used for the assessment are appended.

2.3 Conclusion

In our opinion, the implementation of the hard cover and topsoil cover systems has been successful with the minimum specification being achieved, and should provide adequate protection to the end users of the site.

3. GROUND GAS PROTECTION

3.1 Remediation Aims

EEG Report ref. A0697/20 recommended that a ground gas remediation scheme should be implemented to provide CS2 level protection to protect the end users from the ingress of carbon dioxide or methane.

3.2 Specification and Methodology

Specification

In order to provide CS2 level protection the Client has adopted a passive ventilated sub-floor clear void (a score of 1.5 in BS8485:2015) in combination with a proprietary gas barrier membrane (a score of 2.0 in BS8485:2015), giving a total score of 3.5 in BS8485:2015.

In order to prevent the ingress of ground gases the protective membrane was required to meet the following criteria:

- sufficiently impervious to gases with a methane gas transmission rate of <40.0 ml/day/m²/atm (average) for sheets and joints (tested in accordance with BS.ISO.15105-1 manometric method).
- sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions.
- sufficiently strong to withstand in-service stresses due to say settlement if placed below a floor slab.
- sufficiently strong to withstand the installation process and following trades (penetration from steel fibres in fibre reinforced concrete/ penetration from reinforcement ties/ tearing due to working above it or dropped tools) until covered.
- after installation being capable of providing a complete barrier to the entry of the relevant gas.
- verified in accordance with CIRIA C735 [N1]

The chosen Visqueen Gas Barrier product meets the above criteria and a technical data sheet for the Visqueen membrane is appended.

Methodology

We understand from the Client that each membrane was installed after a thorough clean with warm soapy water to wash away any of the debris/cement accumulated during the construction phase.

The main joints in the membrane were overlapped and the lapped faces were taped with Visqueen double sided dealing tape. The top edge of the overlap was then taped over with single sided tape. The gas membrane spanned the cavity and was continuous across the internal features.

Service penetrations were sealed using four layers of membrane. Each layer was stuck down to the previous using the Visqueen double sided tape and sealed to the upstanding service using single sided tape. Photographs illustrating this methodology are appended, these particular photographs were taken of Plot 7 for demonstration purposes only, as witnessed by Natalie Heaney on the site visit from Wednesday 17th November 2021.

3.3 Verification Inspections

The site was visited on five occasions by a qualified Geoenvironmental Engineer from Sub Surface Consultants Limited to inspect the membrane installation and to confirm that the gas barrier membrane was installed in accordance with both the manufacturer's instructions and the guidelines given in BRE BR414.

A summary of the site visits is given in the following table:

TABLE 3 VERIFICATION SITE VISITS

Date	Area Inspected	Comments
22/10/2020 & 27/10/2020	Plot 2	Inspection of sub floor void and installation of membrane along external walls of Plot 2.
31/03/2021	Plot 2	Inspection of completed Plot 2 membrane.
25/03/2021	Plots 3 & 4	Inspection of sub floor void and installation of membrane along external walls of both Plots 3 & 4.
13/07/2021	Plots 3 & 4	Inspection of completed Plot 3 & 4 membrane.

Copies of photographs taken during the site inspections are appended.

We understand that verification of gas protection installed in Plots 5 to 8 has been undertaken by MEC Environmental Limited and is detailed in their Verification Report dated 14th February 2023.

3.4 Summary of Findings

We can confirm that in our opinion the membrane was installed to the required standard by competent operatives and that in our opinion CS2 level protection has been achieved.

In particular the following items were observed:

- The main joints in the membrane were overlapped by a minimum 200mm, the lapped faces were taped with Visqueen double sided dealing tape, and the top edge of the overlap was taped over with duct tape.
- No punctures or damage were observed and all penetrations were sealed using combinations of Visqueen Gas Barrier membrane, Visqueen double sided tape, and over-sealed with duct tape.
- The gas membrane spanned the cavity and was continuous across the internal features.
- The sub floor ventilation was unobstructed and vented freely to atmosphere via vent bricks in the external wall and vent pipes in sleeper walls.

We can confirm the Visqueen Gas Barrier membrane is the correct product to provide the required level of protection and a copy of the technical data sheet for the membrane is appended.

We understand that tracer gas testing of the membrane integrity in Plots 2 to 4 has been undertaken by MEC Environmental Limited who have provided a separate report on their findings.

4. ECOLOGICALLY PROTECTED AREA OF SCRUB

4.1 Designation

We understand that following recommendations given in the Preliminary Ecological Appraisal (PEA) undertaken by Middleton Ecological Consultancy (MEC) in February 2015 the Planning Conditions for the site require that an area of scrub is to be retained at the rear of the site for the enhancement of site biodiversity and to comply with the National Planning Policy Framework.

The Local Authority Environmental Health Officer has indicated that given the proximity to Plots 7 and 8 the scrub area could potentially be brought into use as garden space. Therefore, for the purposes of this assessment the scrub area has been classified as residential with homegrown produce as defined in the EA Science Report SR3 'Updated Technical Background to the CLEA Model'.

4.2 Contamination Assessment

Six hand dug pits (HD30 to HD35) were taken out at the positions determined and set out by Sub Surface North East Limited, as shown on Figure 13.

The hand dug trial pits were excavated to depths of between 0.35m and 0.60m. Samples were taken for logging, in accordance with BS EN ISO 14688-1: 2018 and BS EN ISO 14689-1: 2018, and the resulting Hand Dug Trial Pit Records are appended.

Three samples of the near surface soil (from HD30, HD32 and HD35) were subjected to the following suite of analyses by an MCERTS and UKAS accredited laboratory (Chemtest Limited):

Arsenic	Nickel
Asbestos	pH
Boron	Phenols
Cadmium	Polynuclear Aromatic Hydrocarbons (16 EPA PAH)
Chromium	Selenium
Copper	Sulphide
Cyanide	Sulphate
Lead	Total Petroleum Hydrocarbons (3-BAND SPECIATION)
Mercury	Zinc

The hand dug pits chosen for contamination analyses were positioned at approximately 7.5m centres, exceeding the minimum sampling density of 10m to 25m centres as recommended in BS 10175:2011+A2:2017 for a detailed investigation.

The results of the contamination analyses are appended.

The results of the analyses were compared with generic assessment criteria (GACs) for residential with homegrown produce.

To assess the polycyclic aromatic hydrocarbon (PAH) contamination the surrogate marker approach has been used. The ratios of the seven genotoxic PAHs (benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(123-cd)pyrene, dibenzo(ah)anthracene and benzo(ghi)perylene) to benzo(a)pyrene, have been determined and compared with the published ratio profile of a coal tar test material (Culp et al in 1998).

The comparison indicates that the PAH contamination matches the Culp profile within reasonable bounds (as defined in DEFRA 2014) allowing the genotoxic PAHs to be assessed against the C4SL for benzo(a)pyrene as a surrogate marker. A copy of the ratio assessment is appended.

The analyses determined one slightly elevated concentration of lead (260mg/kg) in the sample taken from HD32 at 0.00m to 0.40m, when compared with the C4SL critical value of 200mg/kg.

No specific potentially contaminative activities are highlighted in the Phase I report in the vicinity of the scrub area and it is likely that the contamination is derived from past construction and demolition on the site.

Given that the exceedance is marginal with the other two samples tested from the scrub area returning values well below the C4SL (giving a mean concentration across the three samples tested from the scrub area of 132mg/kg) and given the conservative nature of the generic assessment criteria, in our opinion the single exceedance does not represent a very significant risk and in our opinion no remedial action is warranted.

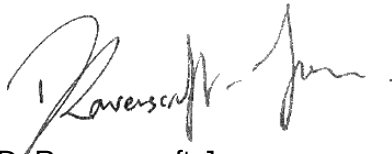
The GACs used for the assessment are appended.

5. GENERAL

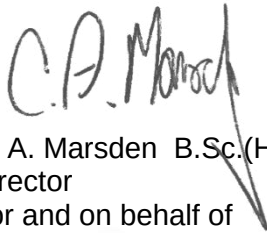
We recommend that this Verification Report should be submitted to the Local Authority Environmental Health Officer for their consideration and written approval obtained prior to finalising the development.

We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please contact the undersigned or Mr David Simpson at our Ossett office.

SUB SURFACE CONSULTANTS LIMITED
REPORT No. NE3941G
MARCH 2023



D. Ravenscroft-Jones Cert Nat Sci (Open), BSc.(Hons.), MSc., CEnv, MEnvSc, AMRSC
Principal Geoenvironmental Engineer
For and on behalf of
Sub Surface Consultants Limited



C. A. Marsden B.Sc.(Hons.), C.Eng., M.I.C.E.
Director
For and on behalf of
Sub Surface Consultants Limited.

GENERIC ASSESSMENT CRITERIA

**SUB SURFACE**

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Contamination Assessment

Site: PLOTS 2 TO 8, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD

Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED

Engineer:

Job Number:

NE3941G

Sheet:

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GENERIC ASSESSMENT CRITERIA - RESIDENTIAL WITH HOMEGROWN PRODUCE

	LQM & CIEH (S4ULs)*
	DEFRA (C4SLs)
	CLAIRE

Dutch Intervention Value

Determinant	GAC	Units
Boron (water soluble)	290	mg/kg
Arsenic	37	mg/kg
Cadmium	11	mg/kg
Chromium III	910	mg/kg
Copper	2,400	mg/kg
Cyanide	20	mg/kg
Mercury	40	mg/kg
Molybdenum	670	mg/kg
Nickel	180	mg/kg
Lead	200	mg/kg
Selenium	250	mg/kg
Zinc	3,700	mg/kg
Chromium VI	6.0	mg/kg
Phenols (total)	120	mg/kg
PAHs		
Naphthalene	2.3	mg/kg
Acenaphthylene	170	mg/kg
Acenaphthene	210	mg/kg
Fluorene	170	mg/kg
Phenanthrene	95	mg/kg
Anthracene	2,400	mg/kg
Fluoranthene	280	mg/kg
Pyrene	620	mg/kg
Eight Genotoxic PAHs**	5.0	mg/kg
BTEX		
Benzene	0.09	mg/kg
Toluene	130	mg/kg
Ethylbenzene	47	mg/kg
m-Xylene	59	mg/kg
p-Xylene	56	mg/kg
o-Xylenes	60	mg/kg
MTBE	160	mg/kg

Determinant	GAC	Units
CWG SUITE		
Aliphatic C5-C6	42	mg/kg
Aliphatic >C6-C8	100	mg/kg
Aliphatic >C8-C10	27	mg/kg
Aliphatic >C10-C12	130	mg/kg
Aliphatic >C12-C16	1,100	mg/kg
Aliphatic >C16-C35	65,000	mg/kg
Aliphatic >C35-C44	65,000	mg/kg
Aromatic C5-C7 (benzene)	70	mg/kg
Aromatic >C7-C8 (toluene)	130	mg/kg
Aromatic >C8-C10	34	mg/kg
Aromatic >C10-C12	74	mg/kg
Aromatic >C12-C16	140	mg/kg
Aromatic >C16-C21	260	mg/kg
Aromatic >C21-C35	1,100	mg/kg
Aromatic >C35-C44	1,100	mg/kg
Aliphatic & Aromatic C44-C70	1,600	mg/kg

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**Benzo(a)pyrene as surrogate marker for Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-c,d)Pyrene, Dibenz(a,h)Anthracene, Benzo(g,h,i)perylene

**SUB SURFACE**

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Contamination Assessment

Site: AREA OF SCRUB ADJ. PLOT 7, LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:

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Sheet:

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GENERIC ASSESSMENT CRITERIA - PUBLIC OPEN SPACE (RESIDENTIAL)

	LQM & CIEH (S4ULs)*
	DEFRA (C4SLs)

Determinant	GAC	Units
Boron (water soluble)	21000	mg/kg
Arsenic	79	mg/kg
Cadmium	120	mg/kg
Chromium III	1500	mg/kg
Copper	12000	mg/kg
Mercury	120	mg/kg
Nickel	230	mg/kg
Lead	630	mg/kg
Selenium	1100	mg/kg
Zinc	81000	mg/kg
Chromium VI	7.7	mg/kg
Phenols (total)	1,300	mg/kg
PAHs		
Naphthalene	4,900	mg/kg
Acenaphthylene	15,000	mg/kg
Acenaphthene	15,000	mg/kg
Fluorene	9,900	mg/kg
Phenanthrene	3,100	mg/kg
Anthracene	74,000	mg/kg
Fluoranthene	3,100	mg/kg
Pyrene	7,400	mg/kg
Benzo(a)anthracene		mg/kg
Chrysene		mg/kg
Benzo(b)fluoranthene		mg/kg
Benzo(k)fluoranthene		mg/kg
Benzo(a)pyrene**	10	mg/kg
Indeno(1,2,3-cd)pyrene		mg/kg
Dibenzo(a,h)anthracene		mg/kg
Benzo(g,h,i)perylene		mg/kg
BTEX		
Benzene	73	mg/kg
Toluene	56,000	mg/kg
Ethylbenzene	25,000	mg/kg
m-Xylene	43,000	mg/kg
p-Xylene	43,000	mg/kg
o-Xylenes	43,000	mg/kg

Determinant	GAC	Units
CWG SUITE		
Aliphatic C5-C6	600,000	mg/kg
Aliphatic >C6-C8	620,000	mg/kg
Aliphatic >C8-C10	13,000	mg/kg
Aliphatic >C10-C12	13,000	mg/kg
Aliphatic >C12-C16	13,000	mg/kg
Aliphatic >C16-C35	250,000	mg/kg
Aliphatic >C35-C44	250,000	mg/kg
Aromatic C5-C7 (benzene)	56,000	mg/kg
Aromatic >C7-C8 (toluene)	56,000	mg/kg
Aromatic >C8-C10	5,000	mg/kg
Aromatic >C10-C12	5,000	mg/kg
Aromatic >C12-C16	5,000	mg/kg
Aromatic >C16-C21	3,800	mg/kg
Aromatic >C21-C35	3,800	mg/kg
Aromatic >C35-C44	3,800	mg/kg
Aliphatic & Aromatic C44-C70	3,800	mg/kg

**Surrogate marker for eight genotoxic PAHs

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CALCULATIONS



SUB SURFACE LIMITED

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Contamination Assessment

Site: PLOT 2, LAUND ROAD, HUDDERSFIELD

Client: CREATIVE (DEVELOPMENTS) HUDDERSFIELD

Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:

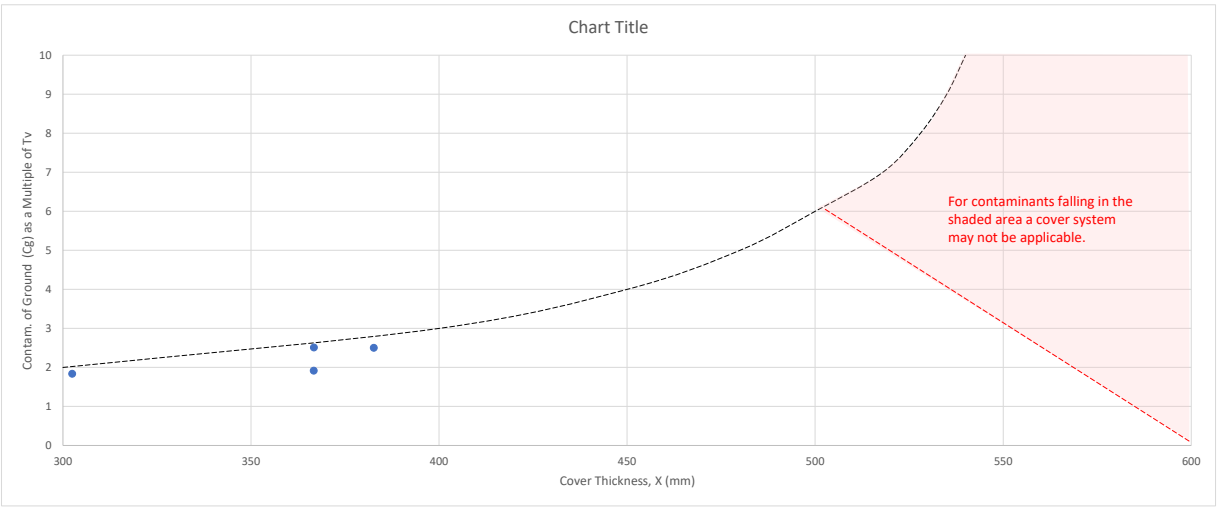
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BRE BR465 TOPSOIL COVER SYSTEM MINIMUM THICKNESS CALCULATOR

Determinand (Maximum Concentrations)	Contam of Ground (mg/kg)	Contam of Cover (mg/kg)	Target Value Tv (mg/kg)	Target Value Source	Soil/Target Value Cg	Cover/Target Value Cc	Cover Required X (mm)
Arsenic	68	6.5	37	S4UL	1.84	0.18	302
Lead	501	29	200	C4SL	2.51	0.15	383
Naphthalene	3.29	0.1	2.3	S4UL	1.43	0.04	186
Benzo(b)fluoranthene	6.53	0.1	2.6	S4UL	2.51	0.04	367
Benzo(a)pyrene	5.29	0.1	5	C4SL	1.06	0.02	34
Dibenz(a,h)anthracene	0.46	0.1	0.24	S4UL	1.92	0.42	367



Assumed Mixed Zone (mm) = 600

Cover system should comprise a minimum 300mm thickness

If X is >= 600mm then a cover sytem may not be appropriate

Minimum Thickness Required :

383 mm

Comments:

Calculations based on BRE Report BR465 "Cover systems for land regeneration" .



SUB SURFACE LIMITED

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Contamination Assessment

Site: PLOT 3, LAUND ROAD, HUDDERSFIELD

Client: CREATIVE (DEVELOPMENTS) HUDDERSFIELD

Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:

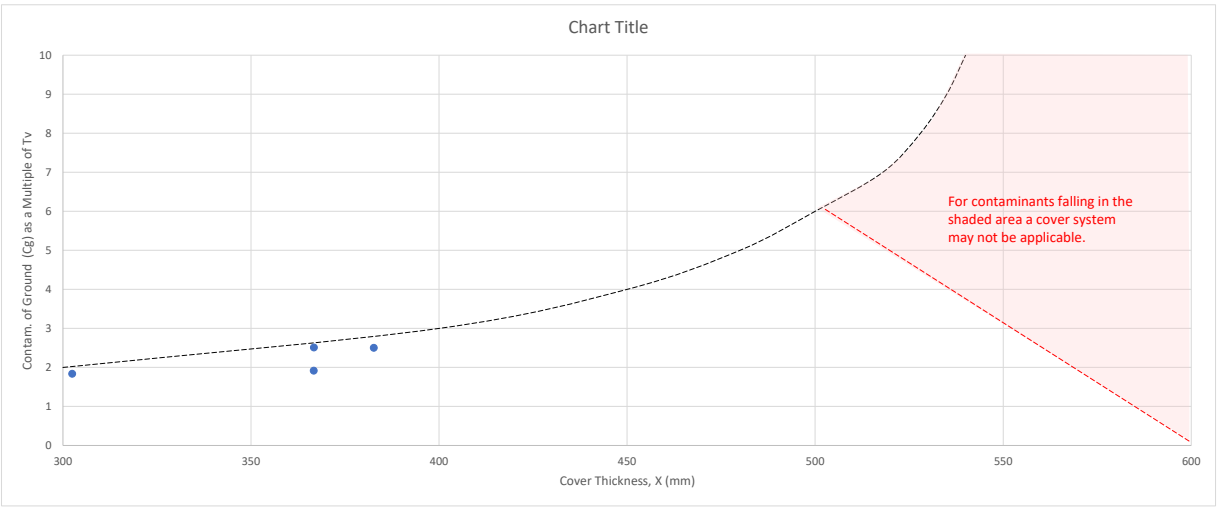
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BRE BR465 TOPSOIL COVER SYSTEM MINIMUM THICKNESS CALCULATOR

Determinand (Maximum Concentrations)	Contam of Ground (mg/kg)	Contam of Cover (mg/kg)	Target Value Tv (mg/kg)	Target Value Source	Soil/Target Value Cg	Cover/Target Value Cc	Cover Required X (mm)
Arsenic	68	6.5	37	S4UL	1.84	0.18	302
Lead	501	29	200	C4SL	2.51	0.15	383
Naphthalene	3.29	0.1	2.3	S4UL	1.43	0.04	186
Benzo(b)fluoranthene	6.53	0.1	2.6	S4UL	2.51	0.04	367
Benzo(a)pyrene	5.29	0.1	5	C4SL	1.06	0.02	34
Dibenz(a,h)anthracene	0.46	0.1	0.24	S4UL	1.92	0.42	367



Assumed Mixed Zone (mm) = 600

Cover system should comprise a minimum 300mm thickness

If X is >= 600mm then a cover sytem may not be appropriate

Minimum Thickness Required :

383 mm

Comments:

Calculations based on BRE Report BR465 "Cover systems for land regeneration" .



SUB SURFACE LIMITED

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Contamination Assessment

Site: PLOT 4, LAUND ROAD, HUDDERSFIELD

Client: CREATIVE (DEVELOPMENTS) HUDDERSFIELD

Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:

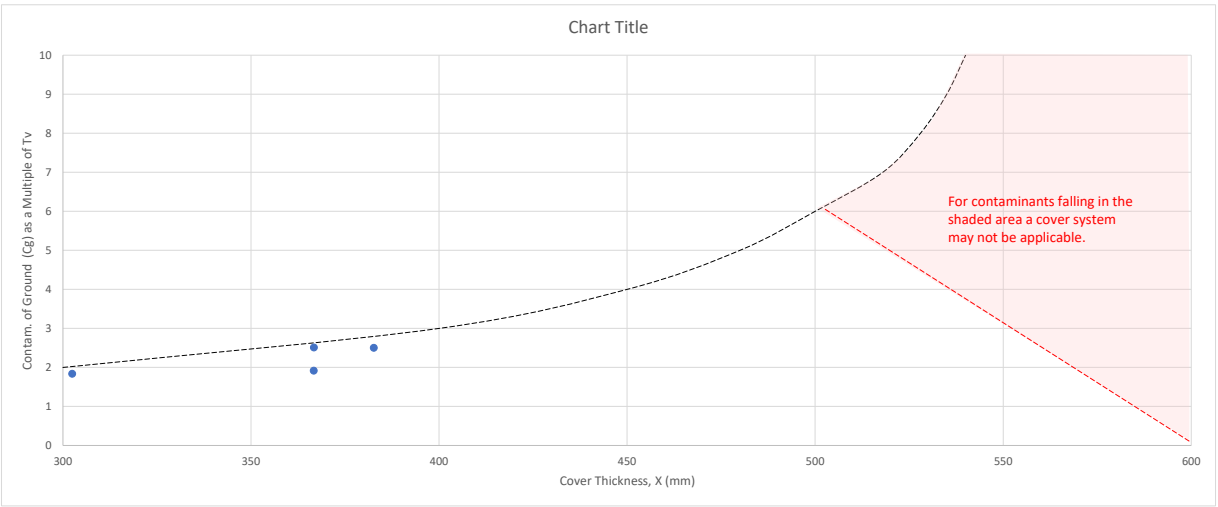
NE3941F/4

Sheet:

1/1

BRE BR465 TOPSOIL COVER SYSTEM MINIMUM THICKNESS CALCULATOR

Determinand (Maximum Concentrations)	Contam of Ground (mg/kg)	Contam of Cover (mg/kg)	Target Value Tv (mg/kg)	Target Value Source	Soil/Target Value Cg	Cover/Target Value Cc	Cover Required X (mm)
Arsenic	68	6.5	37	S4UL	1.84	0.18	302
Lead	501	29	200	C4SL	2.51	0.15	383
Naphthalene	3.29	0.1	2.3	S4UL	1.43	0.04	186
Benzo(b)fluoranthene	6.53	0.1	2.6	S4UL	2.51	0.04	367
Benzo(a)pyrene	5.29	0.1	5	C4SL	1.06	0.02	34
Dibenz(a,h)anthracene	0.46	0.1	0.24	S4UL	1.92	0.42	367



Assumed Mixed Zone (mm) = 600

Cover system should comprise a minimum 300mm thickness

If X is >= 600mm then a cover sytem may not be appropriate

Minimum Thickness Required :

383 mm

Comments:

Calculations based on BRE Report BR465 "Cover systems for land regeneration" .



SUB SURFACE LIMITED

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

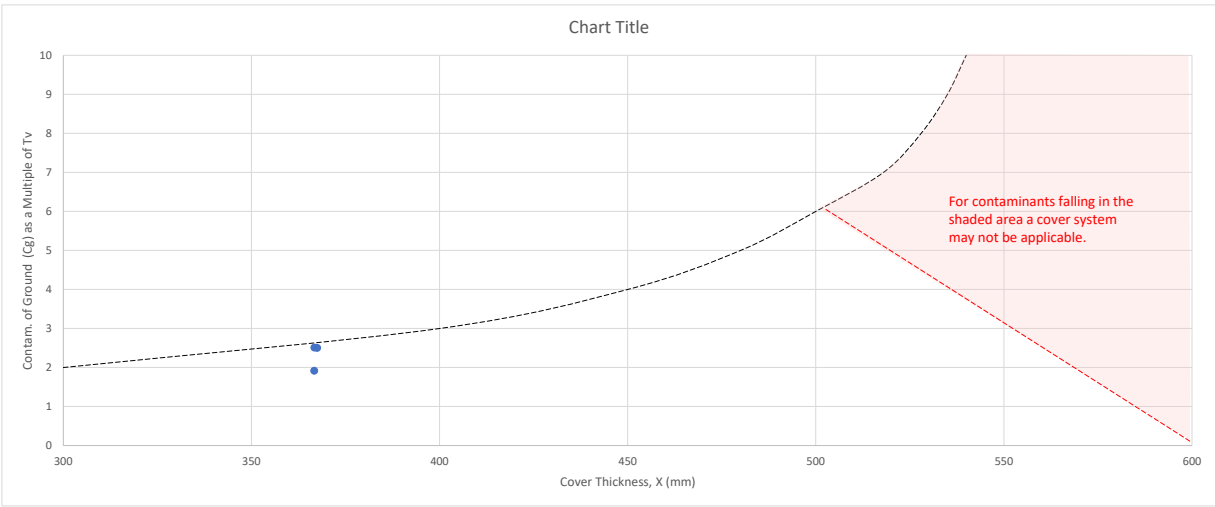
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Contamination Assessment

Site:	PLOT 5, LAUND ROAD, HUDDERSFIELD	Job Number:	NE3941F/5
Client:	CREATIVE (DEVELOPMENTS) HUDDERSFIELD	Sheet:	1/1
Engineer:	NORTHERN DESIGN PARTNERSHIP		

BRE BR465 TOPSOIL COVER SYSTEM MINIMUM THICKNESS CALCULATOR

Determinand (Maximum Concentrations)	Contam of Ground (mg/kg)	Contam of Cover (mg/kg)	Target Value Tv (mg/kg)	Target Value Source	Soil/Target Value Cg	Cover/Target Value Cc	Cover Required X (mm)
Arsenic	68	1	37	S4UL	1.84	0.03	278
Lead	501	9.5	200	C4SL	2.51	0.05	367
Naphthalene	3.29	0.1	2.3	S4UL	1.43	0.04	186
Benzo(b)fluoranthene	6.53	0.1	2.6	S4UL	2.51	0.04	367
Benzo(a)pyrene	5.29	0.1	5	C4SL	1.06	0.02	34
Dibenz(a,h)anthracene	0.46	0.1	0.24	S4UL	1.92	0.42	367



Assumed Mixed Zone (mm) = 600

Cover system should comprise a minimum 300mm thickness

If X is >= 600mm then a cover sytem may not be appropriate

Minimum Thickness Required :

367 mm

Comments:

Calculations based on BRE Report BR465 "Cover systems for land regeneration" .



SUB SURFACE LIMITED

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

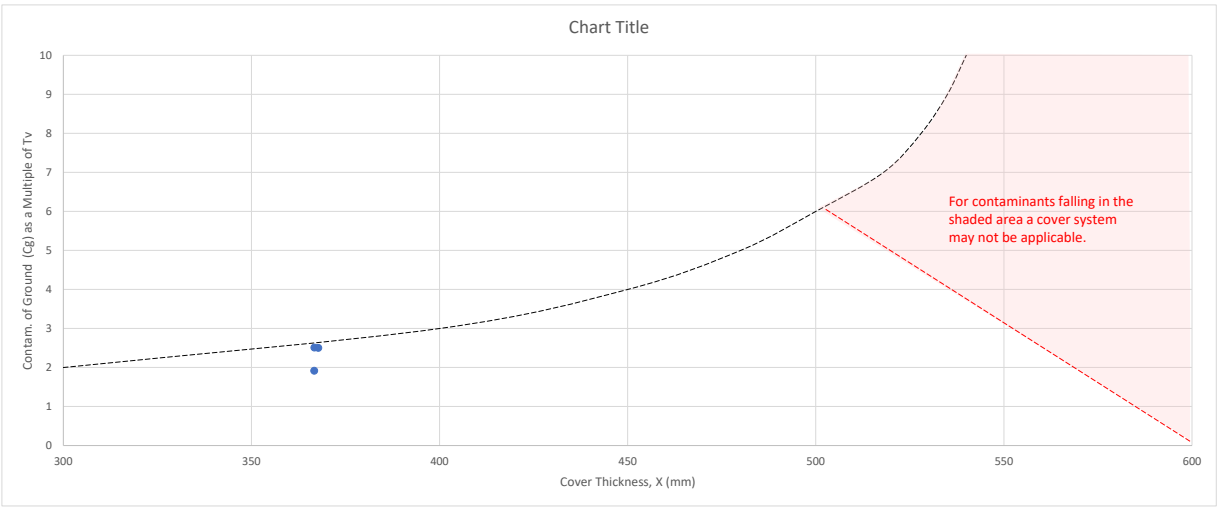
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Contamination Assessment

Site:	PLOT 6, LAUND ROAD, HUDDERSFIELD	Job Number:	NE3941F/6
Client:	CREATIVE (DEVELOPMENTS) HUDDERSFIELD	Sheet:	1/1
Engineer:	NORTHERN DESIGN PARTNERSHIP		

BRE BR465 TOPSOIL COVER SYSTEM MINIMUM THICKNESS CALCULATOR

Determinand (Maximum Concentrations)	Contam of Ground (mg/kg)	Contam of Cover (mg/kg)	Target Value Tv (mg/kg)	Target Value Source	Soil/Target Value Cg	Cover/Target Value Cc	Cover Required X (mm)
Arsenic	68	1.4	37	S4UL	1.84	0.04	279
Lead	501	9.9	200	C4SL	2.51	0.05	368
Naphthalene	3.29	0.1	2.3	S4UL	1.43	0.04	186
Benzo(b)fluoranthene	6.53	0.1	2.6	S4UL	2.51	0.04	367
Benzo(a)pyrene	5.29	0.1	5	C4SL	1.06	0.02	34
Dibenz(a,h)anthracene	0.46	0.1	0.24	S4UL	1.92	0.42	367



Assumed Mixed Zone (mm) = 600

Cover system should comprise a minimum 300mm thickness

If X is >= 600mm then a cover sytem may not be appropriate

Minimum Thickness Required :

368 mm

Comments:

Calculations based on BRE Report BR465 "Cover systems for land regeneration" .



SUB SURFACE LIMITED

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

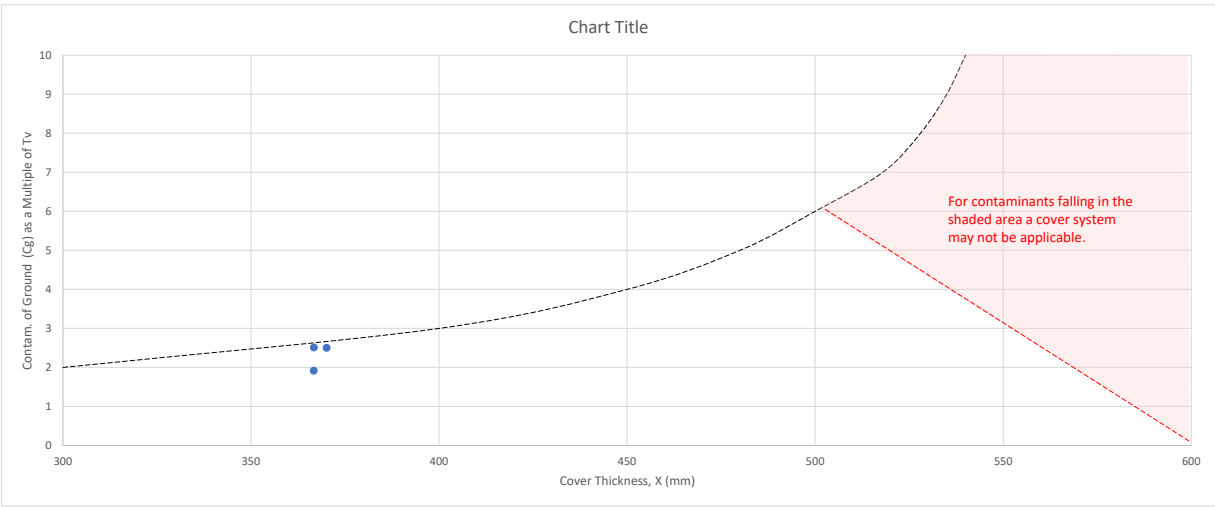
Contamination Assessment

Site: PLOT 7, LAUND ROAD, HUDDERSFIELD
Client: CREATIVE (DEVELOPMENTS) HUDDERSFIELD
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/7
Sheet:
1/1

BRE BR465 TOPSOIL COVER SYSTEM MINIMUM THICKNESS CALCULATOR

Determinand (Maximum Concentrations)	Contam of Ground (mg/kg)	Contam of Cover (mg/kg)	Target Value Tv (mg/kg)	Target Value Source	Soil/Target Value Cg	Cover/Target Value Cc	Cover Required X (mm)
Arsenic	68	3	37	S4UL	1.84	0.08	286
Lead	501	13	200	C4SL	2.51	0.07	370
Naphthalene	3.29	0.1	2.3	S4UL	1.43	0.04	186
Benzo(b)fluoranthene	6.53	0.1	2.6	S4UL	2.51	0.04	367
Benzo(a)pyrene	5.29	0.1	5	C4SL	1.06	0.02	34
Dibenz(a,h)anthracene	0.46	0.1	0.24	S4UL	1.92	0.42	367



Assumed Mixed Zone (mm) = 600

Cover system should comprise a minimum 300mm thickness

If X is >= 600mm then a cover sytem may not be appropriate

Minimum Thickness Required :

370 mm

Comments:

Calculations based on BRE Report BR465 "Cover systems for land regeneration" .



3 Peel Street, Preston, PR2 2OS. Tel. (01772) 561135 Fax (01772) 204907

Contamination Analysis

Engineer:

Job Number:

M3408A

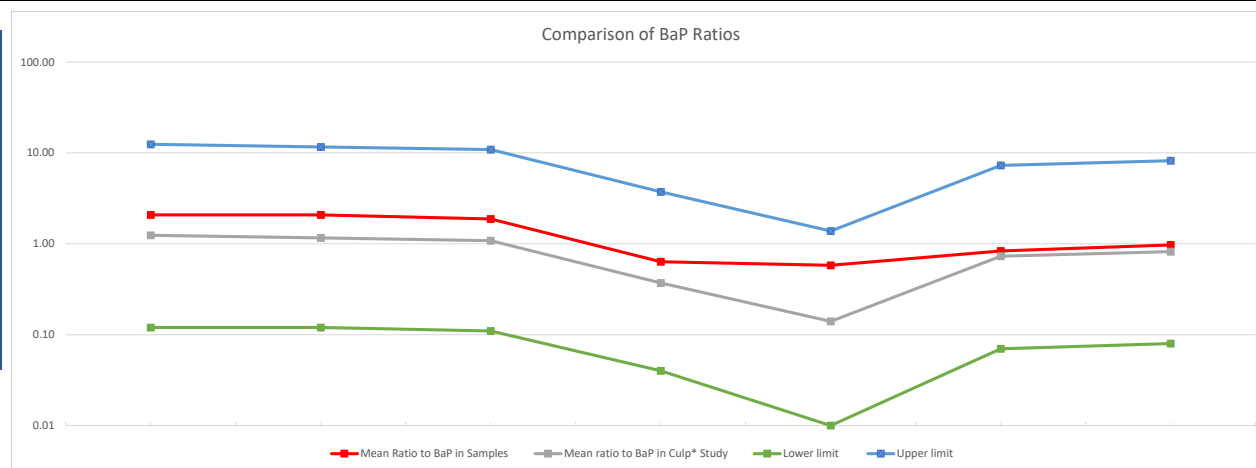
Sheet:

1 / 1

Benzo(a)pyrene Surrogate Marker Test

Ratio to BaP[illegible]

PAH	Units	Mean Concentrations in samples	Mean Ratio to BaP in Samples	Mean ratio to BaP in Culp* Study	Lower limit	Upper limit
Benzo(a)pyrene	mg/kg	1.30	1.00	–	–	–
Benz[a]anthracene	mg/kg	2.70	2.08	1.24	0.12	12.43
Chrysene	mg/kg	2.70	2.08	1.16	0.12	11.61
Benzo[b]fluoranthene	mg/kg	2.43	1.87	1.08	0.11	10.85
Benzo[k]fluoranthene	mg/kg	0.82	0.63	0.37	0.04	3.72
Dibenz[ah]anthracene	mg/kg	0.75	0.58	0.14	0.01	1.38
Indeno[123-cd]pyrene	mg/kg	1.08	0.83	0.73	0.07	7.27
Benzo[ghi]perylene	mg/kg	1.26	0.97	0.82	0.08	8.22



Comments:

*CULP, S.J., GAYLOR, D.W., SHELDON, W.G. GOLDSTEIN, L.W., BELAND, F.A., 1998. A comparison of the tumors induced by coal tar and benzo(a)pyrene in a 2-year bioassay.

Assessed in accordance with Development of Category 4 Screening Levels for assessment of land affected by contamination - SP1010 Appendix E

TRANSFER NOTES FOR TOPSOIL



DARRINGTON QUARRIES LTD

Darrington Lays, Cridding Stubbs, Knottingley, Yorkshire WF11 6AH
Telephone: (01977) 672066 Fax: (01977) 673248
www.fccenvironment.co.uk/darrington

PLACE OF LOADING

CLIPWORTH H

SIGNATURE

HAULER

WHITEHEAD

VEHICLE
REGN No

FX1306

DRIVER'S SIGNATURE

ADRIAN DAVEY

DESCRIPTION OF GOODS

GT LANDSCAPE SOIL
(BS5832:2015)

CUSTOMER

GREEN TECH LTD
Dist Order No
414003

DESTINATION

EX WORKS

RECEIVED BY

SIGNATURE

PRINT NAME

DATE

TICKET NO. 4145547

0

25/08/2021
11:04

First VM 0 kg
Tare VM 10.180 kg 0
Second VM 24.090 kg 0020341

First VM 13920 kg



803461

P & A WHITEHEAD LTD TIPPER HIRE Tel: 07788 913591



Customer

Creative Dev

Delivery Address

laund Rd

Haulage Contractor

P&A

Vehicle Reg No

FX13

Time Loaded

Trailer No

Time Delivered

Driver

A101

Date Delivered 25/8/21

Material Description

Greentech
landscape top soil

Quarry/Pit ticket no

Loading Address

Darrington

GROSS

Tonne

Kiloe

TARE

NETT

14 62

Signed on behalf of customer

S. M. /
SAQIS HAF12

Job Title

White copy: Customer
Yellow copy: Office
Pink copy: Hauler's
Green copy: Book

No: 20951

Darrington Lays, Crilling Station, Northings, Yorkshire WF11 8BH Telephone 01977 670288 Fax 01977 670248 www.darringtonquarries.co.uk/darrington	
PLACE OF ORDER: CUSTOMER NAME: SIGNATURE: MAILED: DATE: VEHICLE REG. NO.: FACILITY: DRAWER'S SIGNATURE: ADDRESS CORRECT:	Order No. 41475514 Date 25/09/2021 Time 09:51 First Vat 0 kg Long Vat 10,180 kg 0 Second Vat 24,700 kg 00200200 Last Vat 14620 kg
DESCRIPTION OF GOODS: BT LANDSCAPE SOIL (200000) 20m3	CUSTOMER: GREENTECH LTD Oak Grove Bldg AL10 1JL England
DESTINATION: EX-WAREHOUSE	
RECEIVED BY: SIGNATURE: PRINT NAME: DATE:	

Darrington Quarries Limited, registered in England (company number 02046), company address at 111, Green Lane, Northings, Wetherby, West Yorkshire LS23 7BQ.
 All customers will receive their own unique contract form. This document has no legal status.
 APPROVED LEAD TIME: 10-15 WORKING DAYS

 DARRINGTON QUARRIES LTD Darrington Lane, Chiddingfold, Basingstoke, Hampshire RG11 3JY Telephone: 01471 87388 Fax: 01471 87385 www.darringtonquarries.co.uk/darrington		A145J556	
PLACE OF LOADING CULLENCHAMPS RD SIGNATURE _____		0 2008-0021 07-05	
TRAILER WHITEHEAD			
VEHICLE REG NO 1713C-VAE		First wt 0 kg Tare wt 10 247 kg 0 Second wt 25 180 kg 0020000	
DRIVER'S SIGNATURE AGRI-TECH EBBW		Total wt 14920 kg	
DESCRIPTION OF GOODS 10T LAMINATE SOIL (BAGGED 2015)		CUSTOMER GREEN TECH LTD Cooks Corner Site H1 10NS Banja	
DESTINATION Ebbw Vale		  	
RECEIVED BY SIGNATURE _____ PRINT NAME _____ DATE _____			

DARRINGTON QUARRIES LIMITED IS A MEMBER OF THE BRITISH QUARRIES ASSOCIATION (BQA) AND IS A MEMBER OF THE
 QUARRIES ASSOCIATION OF GREAT BRITAIN (QAGB) AND IS A MEMBER OF THE
 QUARRIES ASSOCIATION OF GREAT BRITAIN (QAGB) AND IS A MEMBER OF THE

833174

 DARRINGTON QUARRIES LTD		Darrington Lays, Crickling Stubbs, Kestonley, Yorkshire WF11 5AH Telephone: (01977) 672388 Fax: (01977) 673248 www.foamenvironment.co.uk/darrington	
PLACE OF LOADING CUBACRETH H SIGNATURE _____		Ticket No. 4145270 0 00000001 00 00	
HAULER WHITEHEAD			
VEHICLE REGN. No. FR13CWE			
DRIVER'S SIGNATURE ACRIMAN EMBRY		First VA 0 kg Tank VA 40,260 kg 0 General VA 25,200 kg 0029088 Nett VA 15040 kg	
DESCRIPTION OF GOODS QT LANDSCAPE SOIL (ISSUED 2015)		CUSTOMER GREETH TECH LTD Club Centre Ltd 41, 1942 Sarnley	
DESTINATION EX WOODS		 Weighbridge No. 1000  Weighbridge No. 1001  Weighbridge No. 1002	
RECEIVED BY: SIGNATURE _____ PRINT NAME _____ DATE _____			

[illegible]



DARRINGTON QUARRIES LTD

Darrington Lays, Crilling Stubbs, Knottingley, Yorkshire WF11 6AH
Telephone: (01977) 672368 Fax: (01977) 672348
www.darringtonquarries.co.uk/darrington

Ticket No: 4145110

PLACE OF LOADING CLYBURNTH H	8
SIGNATURE	18/09/2021 07:50
HAULER WARTHEAD	
VEHICLE REGN. No.	
DRIVER'S SIGNATURE	First Wt 0 kg Tare Wt 11,200 kg 0 Gross Wt 11,200 kg 0

DESCRIPTION OF GOODS BT LANDSCAPE SOIL (BROWN 2015)	CUSTOMER GREEN TECH LTD Oak Creek Dr 413940 Barnsley
---	--

DESTINATION EX WORKS	RECEIVED BY SIGNATURE
	PRINT NAME
	DATE



Darrington Quarries Ltd, registered in England No. 02048, limited liability company of the United Kingdom. Registered office: Darrington Lays, Crilling Stubbs, Knottingley, Yorkshire WF11 6AH. Registered for VAT No. 254 549 1000. Registered for Companies Act No. 02048. Registered for Companies Act No. 02048. Registered for Companies Act No. 02048.

833025



DARRINGTON QUARRIES LTD

Darrington Lays, Crilling Stubbs, Knottingley, Yorkshire WF11 6AH
Telephone: (01977) 672368 Fax: (01977) 672348
www.darringtonquarries.co.uk/darrington

Ticket No: 4145200

PLACE OF LOADING CLYBURNTH H	8
SIGNATURE	18/09/2021 07:50
HAULER WARTHEAD	
VEHICLE REGN. No.	
DRIVER'S SIGNATURE	First Wt 0 kg Tare Wt 11,200 kg 0 Gross Wt 11,200 kg 0

DESCRIPTION OF GOODS BT LANDSCAPE SOIL (BROWN 2015)	CUSTOMER GREEN TECH LTD Oak Creek Dr 413940 Barnsley
---	--

DESTINATION EX WORKS	RECEIVED BY SIGNATURE
	PRINT NAME
	DATE



Darrington Quarries Ltd, registered in England No. 02048, limited liability company of the United Kingdom. Registered office: Darrington Lays, Crilling Stubbs, Knottingley, Yorkshire WF11 6AH. Registered for VAT No. 254 549 1000. Registered for Companies Act No. 02048. Registered for Companies Act No. 02048. Registered for Companies Act No. 02048.

832934



DARRINGTON QUARRIES LTD

Darrington Lays, Crilling Stubbs, Knottingley, Yorkshire WF11 6AH
Telephone: (01977) 672368 Fax: (01977) 672348
www.darringtonquarries.co.uk/darrington

Ticket No: 4145210

PLACE OF LOADING CLYBURNTH H	8
SIGNATURE	18/09/2021 11:44
HAULER WARTHEAD	
VEHICLE REGN. No.	
DRIVER'S SIGNATURE	First Wt 0 kg Tare Wt 11,200 kg 0 Gross Wt 11,200 kg 0

DESCRIPTION OF GOODS BT LANDSCAPE SOIL (BROWN 2015)	CUSTOMER GREEN TECH LTD Oak Creek Dr 413940 Barnsley
---	--

DESTINATION EX WORKS	RECEIVED BY SIGNATURE
	PRINT NAME
	DATE



Darrington Quarries Ltd, registered in England No. 02048, limited liability company of the United Kingdom. Registered office: Darrington Lays, Crilling Stubbs, Knottingley, Yorkshire WF11 6AH. Registered for VAT No. 254 549 1000. Registered for Companies Act No. 02048. Registered for Companies Act No. 02048. Registered for Companies Act No. 02048.

833133



DARRINGTON QUARRIES LTD

Darrington Lays, Crilling Stubbs, Knottingley, Yorkshire WF11 6AH
Telephone: (01977) 672368 Fax: (01977) 672348
www.darringtonquarries.co.uk/darrington

Ticket No: 4145107

PLACE OF LOADING CLYBURNTH H	8
SIGNATURE	18/09/2021 07:50
HAULER WARTHEAD	
VEHICLE REGN. No.	
DRIVER'S SIGNATURE	First Wt 0 kg Tare Wt 11,200 kg 0 Gross Wt 11,200 kg 0

DESCRIPTION OF GOODS BT LANDSCAPE SOIL (BROWN 2015)	CUSTOMER GREEN TECH LTD Oak Creek Dr 413940 Barnsley
---	--

DESTINATION EX WORKS	RECEIVED BY SIGNATURE
	PRINT NAME
	DATE



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833102



DARRINGTON QUARRIES LTD

Darrington Leys, Cridling Stubbs, Knottingley, Yorkshire WF11 0AH

Telephone: (01977) 672368 Fax: (01977) 673246

www.fccenvironment.co.uk/darrington

Ticket No. 4145631

PLACE OF LOADING

CUSWORTH H

SIGNATURE

HAULIER

WHITEHEAD

VEHICLE
REG'N. No.

FX13CWE

DRIVER'S SIGNATURE

ADRIAN DARBY

0

26/08/2021

09:34

First Wt	0	Kg
Tare Wt	10,220	Kg
Second Wt	25,240	Kg
		0029419

Nett Wt 15020 Kg

DESCRIPTION OF GOODS

GT LANDSCAPE SOIL
(BS3882:2015)

CUSTOMER

GREEN TECH LTD
Quot Order No
414003
Source

DESTINATION

EX WORKS

RECEIVED BY:

SIGNATURE

PRINT NAME

DATE



FS 592766



EMS 592767



OHS 592769

Darrington Quarries Limited, registered in England and Wales No. 0179439, subsidiary company of FCC Environment (UK) Limited, No. 2903416
both registered at 900 Pavilion Drive, Northampton Business Park, Northampton NN4 7PB

AGGREGATES LEVY REGD NO. 10866 0000

835050

P & A WHITEHEAD LTD
TIPPER HIRE
Tel: 07788 913591



Customer: <u>Creave Rev</u>			
Delivery Address: <u>laund Rd</u>			
Haulage Contractor: <u>PeA</u>			
Vehicle Reg No: <u>FX13</u>	Time Loaded:		
Trailer No:	Time Delivered:		
Driver: <u>A.O.I</u>	Date Delivered: <u>25/8/21</u>		
Material Description: <u>Greentech landscape Topsoil</u>		Quarry/Pl ticket no:	
Loading Address: <u>Dorington</u>	GROSS	Tonne	Kilos
	TARE		
	NETT	<u>13.92</u>	
Signed on behalf of customer: <u>[Signature]</u>			
Print Name: <u>SARIS HAY</u>		Job Title:	

White copy: Customer
Yellow copy: Office
Pink copy: Hauler's
Green copy: Book

No: 20952

P & A WHITEHEAD LTD
TIPPER HIRE
Tel: 07788 913591



Customer: <u>Creave Rev</u>			
Delivery Address: <u>laund Road</u>			
Haulage Contractor: <u>PeA</u>			
Vehicle Reg No: <u>FX13</u>	Time Loaded:		
Trailer No:	Time Delivered:		
Driver: <u>A.O.I</u>	Date Delivered: <u>20.8.21</u>		
Material Description: <u>Green tech landscape Topsoil</u>		Quarry/Pl ticket no:	
Loading Address: <u>Dorington</u>	GROSS	Tonne	Kilos
	TARE		
	NETT	<u>15.04</u>	
Signed on behalf of customer: <u>[Signature]</u>			
Print Name: <u>SARIS HAY</u>		Job Title:	

White copy: Customer
Yellow copy: Office
Pink copy: Hauler's
Green copy: Book

No: 20954

P & A WHITEHEAD LTD
TIPPER HIRE
Tel: 07788 913591



Customer: <u>Creave Rev</u>			
Delivery Address: <u>laund Rd</u>			
Haulage Contractor: <u>PeA</u>			
Vehicle Reg No: <u>FX13</u>	Time Loaded:		
Trailer No:	Time Delivered:		
Driver: <u>A.O.I</u>	Date Delivered: <u>20.8.21</u>		
Material Description: <u>Greentech landscape Topsoil</u>		Quarry/Pl ticket no:	
Loading Address: <u>Dorington</u>	GROSS	Tonne	Kilos
	TARE		
	NETT	<u>14.92</u>	
Signed on behalf of customer: <u>[Signature]</u>			
Print Name: <u>SARIS HAY</u>		Job Title:	

White copy: Customer
Yellow copy: Office
Pink copy: Hauler's
Green copy: Book

No: 20953

P & A WHITEHEAD LTD
TIPPER HIRE
Tel: 07788 913591



Customer: <u>Creave Rev</u>			
Delivery Address: <u>laund Road</u>			
Haulage Contractor: <u>PeA</u>			
Vehicle Reg No: <u>FX13</u>	Time Loaded:		
Trailer No:	Time Delivered:		
Driver: <u>A.O.I</u>	Date Delivered: <u>20.8.21</u>		
Material Description: <u>Green tech landscape Topsoil</u>		Quarry/Pl ticket no:	
Loading Address: <u>Dorington</u>	GROSS	Tonne	Kilos
	TARE		
	NETT	<u>14.7</u>	
Signed on behalf of customer: <u>[Signature]</u>			
Print Name: <u>SARIS HAY</u>		Job Title:	

White copy: Customer
Yellow copy: Office
Pink copy: Hauler's
Green copy: Book

No: 20955

P & A WHITEHEAD LTD
TIPPER HIRE
Tel: 07788 913591



Customer: <u>Creave Rev</u>			
Delivery Address: <u>laund Rd</u>			
Haulage Contractor: <u>PeA</u>			
Vehicle Reg No: <u>Y019</u>	Time Loaded:		
Trailer No:	Time Delivered:		
Driver: <u>John</u>	Date Delivered: <u>18.8.21</u>		
Material Description: <u>Green tech landscape Topsoil</u>		Quarry/Pl ticket no:	
Loading Address: <u>Dorington</u>	GROSS	Tonne	Kilos
	TARE		
	NETT	<u>18.24</u>	
Signed on behalf of customer: <u>[Signature]</u>			
Print Name: <u>SARIS HAY</u>		Job Title:	

White copy: Customer
Yellow copy: Office
Pink copy: Hauler's
Green copy: Book

No: 20957

P & A WHITEHEAD LTD
TIPPER HIRE
Tel: 07788 913591



Customer: <u>Creave Rev</u>			
Delivery Address: <u>laund Rd</u>			
Haulage Contractor: <u>PeA</u>			
Vehicle Reg No: <u>Y019</u>	Time Loaded:		
Trailer No:	Time Delivered:		
Driver: <u>John</u>	Date Delivered: <u>18.8.21</u>		
Material Description: <u>Green tech landscape Topsoil</u>		Quarry/Pl ticket no:	
Loading Address: <u>Dorington</u>	GROSS	Tonne	Kilos
	TARE		
	NETT	<u>18.28</u>	
Signed on behalf of customer: <u>[Signature]</u>			
Print Name: <u>SARIS HAY</u>		Job Title:	

White copy: Customer
Yellow copy: Office
Pink copy: Hauler's
Green copy: Book

No: 20956

P & A WHITEHEAD LTD
TIPPER HIRE
Tel: 07788 913591



Customer <i>creative Dev</i>			
Delivery Address <i>land Road</i>			
Haulage Contractor <i>RA</i>			
Vehicle Reg No <i>Y019</i>	Time Loaded		
Trailer No	Time Delivered		
Driver <i>John</i>	Date Delivered <i>19 8 21</i>		
Material Description <i>green tech landscape Topsoil</i>		Quarry/Pl. ticket no	
Loading Address <i>Darrington</i>	GROSS	Tonne	Kilos
	TARE		
	NETT	<i>18</i>	<i>30</i>
Signed on behalf of customer <i>[Signature]</i>			
Print Name <i>SALES MANAGER</i>		Job Title	

White copy: Customer
Yellow copy: Office
Pink copy: Haulier's
Green copy: Book

No: 20959

P & A WHITEHEAD LTD
TIPPER HIRE
Tel: 07788 913591



Customer <i>creative Dev</i>			
Delivery Address <i>land Rd</i>			
Haulage Contractor <i>RA</i>			
Vehicle Reg No <i>Y019</i>	Time Loaded		
Trailer No	Time Delivered		
Driver <i>John</i>	Date Delivered <i>19 8 21</i>		
Material Description <i>green tech landscape Topsoil</i>		Quarry/Pl. ticket no	
Loading Address <i>Darrington</i>	GROSS	Tonne	Kilos
	TARE		
	NETT	<i>18</i>	<i>30</i>
Signed on behalf of customer <i>[Signature]</i>			
Print Name <i>SALES MANAGER</i>		Job Title	

White copy: Customer
Yellow copy: Office
Pink copy: Haulier's
Green copy: Book

No: 20958

P & A WHITEHEAD LTD
TIPPER HIRE
Tel: 07788 913591



Customer <i>creative Dev</i>			
Delivery Address <i>land Rd</i>			
Haulage Contractor <i>RA</i>			
Vehicle Reg No <i>FX13</i>	Time Loaded		
Trailer No	Time Delivered		
Driver <i>AND</i>	Date Delivered <i>26 8 21</i>		
Material Description <i>green tech landscape Topsoil</i>		Quarry/Pl. ticket no	
Loading Address <i>Darrington</i>	GROSS	Tonne	Kilos
	TARE		
	NETT	<i>15</i>	<i>02</i>
Signed on behalf of customer <i>[Signature]</i>			
Print Name <i>SALES MANAGER</i>		Job Title	

White copy: Customer
Yellow copy: Office
Pink copy: Haulier's
Green copy: Book

No: 20960

DARRINGTON QUARRIES LTD

Darrington Leys, Cridling Stubbs, Knottingley, Yorkshire WF11 0AH
Telephone: (01977) 672368 Fax: (01977) 673246
www.fccenvironment.co.uk/darrington

Ticket No. 4171281

PLACE OF LOADING

CUSWORTH H

SIGNATURE

0

22/06/2022
09:04

HAULIER

WHITEHEAD

VEHICLE
REG. No.

YD1SAWR

First Wt

0 Kg

Tare Wt

13,060 Kg

Second Wt

31,080 Kg

0

0054357

DRIVER'S SIGNATURE

JORDAN ASHINGT

Nett Wt

18020

Kg

DESCRIPTION OF GOODS

GT LANDSCAPE SOIL
(BS3882:2015)

CUSTOMER

GREEN TECH LTD

Order No

420704

Source

DESTINATION

EX WORKS



ISO 9001
Quality
Management
Systems
CERTIFIED

REG. NO. 151278



ISO 14001
Environmental
Management
CERTIFIED

REG. NO. 151277



ISO 45001
Occupational
Health and Safety
Management
CERTIFIED

REG. NO. 151276



ISO 50001
Energy
Management
CERTIFIED

REG. NO. 151275

RECEIVED BY:

SIGNATURE

PRINT NAME

DATE

JA
JORDAN
22.6.22

DARRINGTON QUARRIES LTD

Darrington Leys, Cridling Stubbs, Knottingley, Yorkshire WF11 0AH

Telephone: (01977) 672368 Fax: (01977) 673246

www.fccenvironment.co.uk/darrington

Ticket No. 4171210

PLACE OF LOADING

CUSWORTH H

SIGNATURE

0

21/06/2022

13:31

HAULIER

PA WHITEHEAD

VEHICLE

REG N. No

YG17HWP

First Wt

0 Kg

Tare Wt

13,220 Kg

Second Wt

31,260 Kg

0

0054282

DRIVER'S SIGNATURE

GRAHAM TORRIE

Nett Wt

18040

Kg

DESCRIPTION OF GOODS

GT LANDSCAPE SOIL
(BS3882:2015)

CUSTOMER

GREEN TECH LTD

Order No

420679

Source

DESTINATION

EX WORKS

RECEIVED BY:

SIGNATURE

PRINT NAME

DATE





DARRINGTON QUARRIES LTD

Darrington Leys, Cridling Stubbs, Knottingley, Yorkshire WF11 0AH
Telephone: (01977) 672368 Fax: (01977) 673246
www.fccenvironment.co.uk/darrington

Ticket No. 4171168

PLACE OF LOADING

CUSWORTH H

SIGNATURE

0

21/08/2022
10:51

HAULIER

PA WHITEHEAD

VEHICLE

REG N: YU7HWP

First Wt	0	Kg
Tare Wt	13,220	Kg
Second Wt	31,820	Kg
	0054243	

DRIVER'S SIGNATURE

GRAHAM TORRIE

Nett Wt 18400 Kg

DESCRIPTION OF GOODS
GT LANDSCAPE SOIL
(BS3882:2015)

CUSTOMER
GREEN TECH LTD
Cust. Order No
420679
Source

DESTINATION
EX WORKS

RECEIVED BY:

SIGNATURE

PRINT NAME

DATE



Darrington Quarries Limited, registered in England and Wales No. 0579404. Subsidiary company of FCC Environment plc Limited, No. 3000418
both registered at 2 Solihull Court, White Star Way, Birmingham B44 9WJ

AGGREGATES LEVY REGD NO. 10866 0000

891764



DARRINGTON QUARRIES LTD

Darrington Leys, Cridding Stubbs, Knottingley, Yorkshire WF11 0AH
Telephone: (01977) 672368 Fax: (01977) 673246
www.fccenvironment.co.uk/darrington

4160691

PLACE OF LOADING

QUSWORTH H

SIGNATURE

HAULER

WHITEHEAD

VEHICLE
REGN. No.

PA13CWE

DRIVER'S SIGNATURE

AERIAN DAREV

First Wt 0 Kg
Tare Wt 10,210 Kg
Second Wt 25,400 Kg

Nett Wt 15160 Kg

DESCRIPTION OF GOODS

GT LANDSCAPE SOIL
(BS3682 2015)

CUSTOMER

GREEN TECH LTD
Quote Order No
417060
SALZ CE

DESTINATION

EX WORKS

RECEIVED BY:

SIGNATURE

PRINT NAME

DATE



FS 50234



EMS 50213



OMS 50219

Darrington Quarries Limited, registered in England and Wales No. 0179376, trading company of FCC Environment (UK) Limited, No. 089519
with registered office at 100 The Quadrant, Northampton Road, Northampton NN1 7AB
AGGREGATES LEVY REGD NO. 10666 0000

861728



DARRINGTON QUARRIES LTD

Darrington Leys, Cridding Stubbs, Knottingley, Yorkshire WF11 0AH
Telephone: (01977) 672368 Fax: (01977) 673246
www.fccenvironment.co.uk/darrington

PLACE OF LOADING

QUSWORTH H

SIGNATURE

HAULER

WHITEHEAD

VEHICLE
REGN. No.

PA13CWE

DRIVER'S SIGNATURE

AERIAN DAREV

0

25/02/2022
11:28

First Wt 0 Kg
Tare Wt 10,220 Kg
Second Wt 20,580 Kg

Nett Wt 10360 Kg

DESCRIPTION OF GOODS

GT LANDSCAPE SOIL
(BS3682 2015)

CUSTOMER

GREEN TECH LTD
Quote Order No
410017

DESTINATION

EX WORKS

RECEIVED BY:

SIGNATURE

PRINT NAME

DATE

FS 50234



FS 50234



EMS 50213



OMS 50219

Darrington Quarries Limited, registered in England and Wales No. 0179376, trading company of FCC Environment (UK) Limited, No. 089519
with registered office at 100 The Quadrant, Northampton Road, Northampton NN1 7AB
AGGREGATES LEVY REGD NO. 10666 0000

861940

DARRINGTON QUARRIES LTD

Darrington Leys, Cridling Stubbs, Knottingley, Yorkshire WF11 0AH
Telephone: (01977) 672368 Fax: (01977) 673246
www.fccenvironment.co.uk/darrington

Ticket No. 4160846

PLACE OF LOADING

CUSWORTH H

SIGNATURE

HAULIER

WHITEHEAD

VEHICLE
REG'N. No.

FX13CWE

DRIVER'S SIGNATURE

ADRIAN DARBY

0

25/02/2022
07:44

First Wt	0 Kg
Tare Wt	10,220 Kg
Second Wt	25,360 Kg
Nett Wt	15,140 Kg

DESCRIPTION OF GOODS

GT LANDSCAPE SOIL
(BS3882:2015)

CUSTOMER

GREEN TECH LTD
Cust Order No
416047

DESTINATION

EX WORKS

RECEIVED BY:

SIGNATURE

PRINT NAME

DATE



FS 592766



EMS 592767



OHS 592769

CONTAMINATION ANALYSIS RESULTS



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Mark Wood
Green-tech Ltd
Rabbit Hill Business Park
Great North Road
Arkendale
Knaresborough
North Yorkshire HG5 0FF

27th May 2021
Our Ref: TOHA/21/9991/SS
Your Ref: PO 411616

Dear Sirs

Topsoil Analysis Report: Barnsdale Landscape Grade Topsoil

We have completed the analysis of the soil sample recently submitted, referenced *Barnsdale Landscape Grade Topsoil*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the topsoil source. The report and results should therefore not be used by third parties as a means of verification or validation testing or waste designation purposes, especially after the topsoil has left the Green-tech Ltd site.

SAMPLE EXAMINATION

The sample was described as a brown (Munsell Colour 7.5YR 4/3), slightly moist, friable, very slightly calcareous, fine to medium LOAMY SAND with a weakly developed, very fine to fine granular structure*. The sample was virtually stone-free and contained a low proportion of organic fines and very occasional woody fragments. No unusual odours, roots or rhizomes of pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample(s). Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T:01491 822653 E:info@toha.co.uk
www.toha.co.uk

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- detailed particle size analysis (5 sands, silt, clay);
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Detailed Particle Size Analysis and Stone Content

The sample fell into the *loamy sand* texture class. Further detailed particle size analysis found the sample to have a sufficiently narrow particle size distribution and a predominance of *medium sand* (0.25-0.50mm) followed by smaller proportions of *fine sand* (0.15-0.25mm). This particle size distribution is usually considered suitable for general landscape applications provided the soil's physical condition is satisfactory.

The sample was virtually stone-free and as such, stones should not restrict the use of the soil for general landscape purposes.

pH and Electrical Conductivity Values

The sample was strongly alkaline in reaction (pH 8.5). This pH value would be considered suitable for general landscape purposes providing species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was low, which indicates that soluble salts should not be present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (BS3882 requirement) fell below the maximum specified value (3300 µS/cm) given in BS3882:2015 – Table 1.

Organic Matter and Fertility Status

The sample was adequately supplied with organic matter and most major plant nutrients, but was deficient in total nitrogen. This can be remedied by an appropriate fertiliser application.

The C:N ratio of the sample was acceptable for general landscape purposes.

Potential Contaminants

With reference to *BS3882:2015 - Table 1: Notes 3 and 4*, there is a recommendation to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations that affect human health have been assessed for *residential with homegrown produce* end-use against the Suitable For Use Levels (S4ULs) presented in *The LQM/CIEH S4ULs for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels (C4SLs) for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS3882:2015 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

From the soil examination and subsequent laboratory analysis, the sample was described as strongly alkaline, non-saline, very slightly calcareous loamy sand with a weakly developed structure and very low stone content. The sample was adequately supplied in organic matter and most major plant nutrients, but was deficient in total nitrogen. Of the potential contaminants determined, none exceeded their respective guideline values.

To conclude, based on our findings, the topsoil represented by this sample would be considered suitable for general landscape purposes (trees, shrubs and amenity grass), provided species with a wide pH tolerance or those known to prefer alkaline soils are selected, the total nitrogen deficiency is addressed and the physical condition of the soil is satisfactory.

The sample was largely compliant with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for topsoil and requirements for use – Table 1, Multipurpose Topsoil*) with the exception of a deficiency in total nitrogen. On this occasion, this is considered a minor non-compliance, provided it is remedied with a routine fertiliser application.

General Landscape Environments

Rootballed Trees

The most demanding planting environment is semi-mature, pit planted trees. Trees of this size and age have grown accustomed to optimum growing conditions in the nursery, and these need to be replicated when the rootballed or containerised tree is planted in the pit. In particular, aeration and drainage around the rootball are critical. Without these properties, trees will very quickly suffer and possibly die during their first few growing seasons after planting.

The topsoil can be used as backfill in tree pits to a maximum depth of 400mm, provided the topsoil is kept dry and non-plastic during planting.

Shrubs

Containerised shrubs are generally more tolerant of a wider range of soil-types, and they require less topsoil to root into than trees. The topsoil would be suited to a range of shrubs typically used in commercial and domestic landscaping.

Forestry Stock

Less demanding planting habitats include indigenous woodland planting, planted as small whips and feathered trees. The topsoil would be suitable for such planting environments.

Amenity Grass

This soil would be considered suitable for amenity grass seeding and turfing

Sports Pitches

This soil is suited for sports pitch construction given its high sand content. However, all materials to be used for sports pitch construction, including topsoil, should be carefully considered in relation to the required performance and standard of the sports pitch.

Domestic Gardens

The horticultural properties of the soil would be suitable for domestic garden applications. In addition, of the potential contaminants determined, none was found at levels that would be considered elevated. However, permissible levels for potential contaminants do vary from site to site. Therefore, the suitability of topsoil represented by this sample for any particular project or development should be confirmed by comparing the results against the site's specific assessment criteria.

RECOMMENDATIONS

Fertiliser for Planting

To address the nutrient deficiency and to help promote effective plant establishment, we recommend applying and incorporating the compound, controlled release fertiliser *ICL Osmocote PrePlant* (17%N:9%P₂O₅:10%K₂O:2%MgO+TE) at a rate of 70 g/m² for planting beds and/or 180 g/tree pit, and to a depth of 200mm.

Fertiliser for Amenity Grass Establishment

To address the nutrient deficiency and to help promote effective grass establishment, we recommend applying and incorporating the pre-seeding grass fertiliser *ICL Sportsmaster Pre-seeder* (8%N:12%P₂O₅:8%K₂O+3%MgO) prior to seeding or turfing at a rate of 35 g/m² and to a depth of 100mm.

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, resspreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is reasonably dry and non-plastic (friable) in consistency.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

Further details on soil handling are provided in Annex A of BS3882:2015.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully



Tilly Kimble-Wilde
BSc MSc
Graduate Soil Scientist



Rebecca Hollands
BSc MSc MScSoilSci
Senior Soil Scientist

For & on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	Green-tech Ltd
Project:	Barnsdale Landscape Grade
Job:	Topsoil Analysis - BS3882:2015
Date:	27/05/2021
Job Ref No:	TOHA/21/9991/SS

Sample Reference		
		Accreditation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.05mm)	%	UKAS
Very Fine Sand (0.05-0.15mm)	%	UKAS
Fine Sand (0.15-0.25mm)	%	UKAS
Medium Sand (0.25-0.50mm)	%	UKAS
Coarse Sand (0.50-1.0mm)	%	UKAS
Very Coarse Sand (1.0-2.0mm)	%	UKAS
Total Sand (0.05-2.0mm)	%	UKAS
Texture Class (UK Classification)	-	UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-50mm)	% DW	GLP
Stones (>50mm)	% DW	GLP

Landscape Grade	
6	
16	
18	
23	
30	
4	
3	
78	
LS	
1	
0	
0	

pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS
Exchangeable Sodium Percentage	%	UKAS
Organic Matter (LOI)	%	UKAS
Total Nitrogen (Dumas)	%	UKAS
C : N Ratio	ratio	UKAS
Extractable Phosphorus	mg/l	UKAS
Extractable Potassium	mg/l	UKAS
Extractable Magnesium	mg/l	UKAS

8.5	
435	
2364	
2.9	
3.0	
0.12	
15	
31	
430	
132	

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total (mono) Phenols	mg/kg	MCERTS

4	
0.4	
7	
< 4.0	
21	
14	
< 0.3	
7	
< 1.0	
37	
0.7	
< 1.0	
< 1.0	

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benzo(a)anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benzo(b)fluoranthene	mg/kg	MCERTS
Benzo(k)fluoranthene	mg/kg	MCERTS
Benzo(a)pyrene	mg/kg	MCERTS
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS
Dibenz(a,h)anthracene	mg/kg	MCERTS
Benzo(g,h,i)perylene	mg/kg	MCERTS
Total PAHs (sum USEPA16)	mg/kg	MCERTS

< 0.05	
< 0.05	
< 0.05	
< 0.05	
< 0.05	
< 0.05	
< 0.05	
< 0.05	
< 0.05	
< 0.05	
< 0.05	
< 0.05	
< 0.05	
< 0.05	
< 0.05	
< 0.80	

Aliphatic TPH >C5 - C6	mg/kg	MCERTS
Aliphatic TPH >C6 - C8	mg/kg	MCERTS
Aliphatic TPH >C8 - C10	mg/kg	MCERTS
Aliphatic TPH >C10 - C12	mg/kg	MCERTS
Aliphatic TPH >C12 - C16	mg/kg	MCERTS
Aliphatic TPH >C16 - C21	mg/kg	MCERTS
Aliphatic TPH >C21 - C35	mg/kg	MCERTS
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS
Aromatic TPH >C5 - C7	mg/kg	MCERTS
Aromatic TPH >C7 - C9	mg/kg	MCERTS
Aromatic TPH >C9 - C10	mg/kg	MCERTS
Aromatic TPH >C10 - C12	mg/kg	MCERTS
Aromatic TPH >C12 - C16	mg/kg	MCERTS
Aromatic TPH >C16 - C21	mg/kg	MCERTS
Aromatic TPH >C21 - C35	mg/kg	MCERTS
Aromatic TPH (C5 - C35)	mg/kg	MCERTS

< 0.001	
< 0.001	
< 0.001	
< 1.0	
< 2.0	
< 8.0	
< 8.0	
< 10	
< 0.001	
< 0.001	
< 0.001	
< 1.0	
< 2.0	
< 10	
< 10	
< 10	

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
p & m-xylene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

< 0.001	
< 0.001	
< 0.001	
< 0.001	
< 0.001	
< 0.001	

Asbestos Screen	ND/D	ISO 17025
-----------------	------	-----------

Not-detected	
--------------	--

LS = LOAMY SAND

Visual Examination

The sample was described as a brown (Munsell Colour 7.5YR 4/3), slightly moist, friable, very slightly calcareous, fine to medium LOAMY SAND with a weakly developed, very fine to fine granular structure. The sample was virtually stone-free and contained a low proportion of organic fines and very occasional woody fragments. No unusual odours, roots or rhizomes of pernicious weeds were observed.

Results of analysis should be read in conjunction with the report they were issued with

The contents of this certificate shall not be reproduced without the express written permission of Tim O'Hare Associates LLP.

mtkimble-wilde

Tilly Kimble-Wilde
BSc MSc
Graduate Soil Scientist



Final Report

Report No.: 21-30695-1
Initial Date of Issue: 14-Sep-2021
Client Sub Surface
Client Address: 3 Peel Street
Preston
Lancashire
PR2 2QS
Contact(s): Simon Gabbatt
Project NE3941D Plot 2, 3, 4 Laund Road,
Huddersfield
Quotation No.:
Order No.:
No. of Samples: 3
Turnaround (Wkdays): 7
Date Approved: 14-Sep-2021
Approved By:

Details: Glynn Harvey, Technical Manager

Date Received: 06-Sep-2021

Date Instructed: 06-Sep-2021

Results Due: 14-Sep-2021

Results - Soil

Project: NE3941D Plot 2, 3, 4 Laund Road, Huddersfield

Client: Sub Surface	Chemtest Job No.:				21-30695	21-30695	21-30695
Quotation No.:	Chemtest Sample ID.:				1272947	1272948	1272949
	Client Sample ID.:				21	22	23
	Sample Location:				HD1	HD2	HD3
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				0.00	0.00	0.00
	Date Sampled:				25-Aug-2021	25-Aug-2021	25-Aug-2021
	Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	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
Moisture	N	2030	%	0.020	6.5	6.7	7.0
pH	U	2010		4.0	8.3	8.6	8.2
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	< 0.40	< 0.40
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	1.1	1.4	0.81
Sulphate (Total)	U	2430	%	0.010	0.025	0.031	0.018
Arsenic	U	2450	mg/kg	1.0	6.5	5.7	3.5
Cadmium	U	2450	mg/kg	0.10	0.25	0.25	0.17
Chromium	U	2450	mg/kg	1.0	110	5.8	4.2
Molybdenum	U	2450	mg/kg	2.0	< 2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	18	17	12
Mercury	U	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	7.1	5.9	4.6
Lead	U	2450	mg/kg	0.50	29	19	11
Selenium	U	2450	mg/kg	0.20	< 0.20	< 0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	34	31	23
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
TPH >C6-C10	N	2670	mg/kg	1.0	< 1.0	1.1	< 1.0
TPH >C10-C21	N	2670	mg/kg	1.0	< 1.0	36	< 1.0
TPH >C21-C40	N	2670	mg/kg	1.0	< 1.0	97	< 1.0
Total TPH >C6-C40	U	2670	mg/kg	10	< 10	130	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: NE3941D Plot 2, 3, 4 Laund Road, Huddersfield

Client: Sub Surface	Chemtest Job No.:				21-30695	21-30695	21-30695
Quotation No.:	Chemtest Sample ID.:				1272947	1272948	1272949
	Client Sample ID.:				21	22	23
	Sample Location:				HD1	HD2	HD3
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				0.00	0.00	0.00
	Date Sampled:				25-Aug-2021	25-Aug-2021	25-Aug-2021
	Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD			
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Report Information

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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 TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°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

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.:	22-23882-1		
Initial Date of Issue:	04-Jul-2022		
Client	Sub Surface		
Client Address:	3 Peel Street Preston Lancashire PR2 2QS		
Contact(s):	Simon Gabbatt		
Project	NE3941 Laund Road, Huddersfield		
Quotation No.:		Date Received:	27-Jun-2022
Order No.:		Date Instructed:	27-Jun-2022
No. of Samples:	2		
Turnaround (Wkdays):	7	Results Due:	05-Jul-2022
Date Approved:	04-Jul-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: NE3941 Laund Road, Huddersfield

Client: Sub Surface	Chemtest Job No.:				22-23882	22-23882
Quotation No.:	Chemtest Sample ID.:				1455687	1455688
	Client Sample ID.:				91	92
	Sample Location:				Plot 5 HD1	Plot 6 HD1
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.20	0.00
	Bottom Depth (m):				0.50	0.50
	Date Sampled:				22-Jun-2022	22-Jun-2022
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	9.1	9.3
pH	U	2010		4.0	8.5	8.7
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.40	1.5
Cyanide (Total)	U	2300	mg/kg	0.50	0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	< 0.50	< 0.50
Sulphate (Total)	U	2430	%	0.010	0.033	0.031
Arsenic	U	2455	mg/kg	0.5	1.0	1.4
Cadmium	U	2455	mg/kg	0.10	< 0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	3.2	4.9
Molybdenum	U	2455	mg/kg	0.5	< 0.5	< 0.5
Copper	U	2455	mg/kg	0.50	6.8	8.4
Mercury	U	2455	mg/kg	0.05	< 0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	3.2	4.9
Lead	U	2455	mg/kg	0.50	9.5	9.9
Selenium	U	2455	mg/kg	0.25	< 0.25	< 0.25
Zinc	U	2455	mg/kg	0.50	16	19
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
TPH >C6-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0
TPH >C10-C21	N	2670	mg/kg	1.0	7.8	< 1.0
TPH >C21-C40	N	2670	mg/kg	1.0	26	< 1.0
Total TPH >C6-C40	U	2670	mg/kg	10	33	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10

Results - Soil

Project: NE3941 Laund Road, Huddersfield

Client: Sub Surface	Chemtest Job No.:				22-23882	22-23882
Quotation No.:	Chemtest Sample ID.:				1455687	1455688
	Client Sample ID.:				91	92
	Sample Location:				Plot 5 HD1	Plot 6 HD1
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.20	0.00
	Bottom Depth (m):				0.50	0.50
	Date Sampled:				22-Jun-2022	22-Jun-2022
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10

Report Information

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The results relate only to the items tested

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 TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°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

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 22-08577-1
Initial Date of Issue: 16-Mar-2022
Client Sub Surface
Client Address: 3 Peel Street
Preston
Lancashire
PR2 2QS
Contact(s): Simon Gabbatt
Project NE3941F7 Plots 7 & 8, Laund Road,
Huddersfield

Quotation No.: **Date Received:** 08-Mar-2022

Order No.: **Date Instructed:** 08-Mar-2022

No. of Samples: 5

Turnaround (Wkdays): 7 **Results Due:** 16-Mar-2022

Date Approved: 16-Mar-2022

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: NE3941F7 Plots 7 & 8, Laund Road, Huddersfield

Client: Sub Surface	Chemtest Job No.:				22-08577	22-08577	22-08577	22-08577	22-08577
Quotation No.:	Chemtest Sample ID.:				1386476	1386477	1386478	1386479	1386480
	Client Sample ID.:				890	892	895	896	898
	Sample Location:				HD30	HD32	HD35	HD36	HD38
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.20	0.00	0.10	0.20	0.10
	Bottom Depth (m):				0.50	0.40	0.40	0.60	0.50
	Date Sampled:				25-Feb-2022	25-Feb-2022	25-Feb-2022	25-Feb-2022	25-Feb-2022
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	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
Moisture	N	2030	%	0.020	40	26	26	23	16
pH	U	2010		4.0	7.1	6.3	5.8	8.5	8.4
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.56	0.87	1.5	1.0	1.0
Cyanide (Total)	U	2300	mg/kg	0.50	0.60	0.50	0.60	< 0.50	0.60
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	1.6	1.8	1.9	0.51	1.3
Sulphate (Total)	U	2430	%	0.010	0.11	0.16	0.013	0.049	0.031
Arsenic	U	2450	mg/kg	1.0	12	23	1.7	2.3	3.0
Cadmium	U	2450	mg/kg	0.10	0.46	0.33	< 0.10	0.18	0.17
Chromium	U	2450	mg/kg	1.0	56	27	5.4	5.3	5.5
Molybdenum	U	2450	mg/kg	2.0	< 2.0	7.0	< 2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	50	48	5.5	15	9.9
Mercury	U	2450	mg/kg	0.10	0.70	0.47	< 0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	32	23	6.3	5.4	5.7
Lead	U	2450	mg/kg	0.50	130	260	8.0	13	13
Selenium	U	2450	mg/kg	0.20	0.37	0.76	< 0.20	< 0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	310	98	13	24	25
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
TPH >C6-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C21	N	2670	mg/kg	1.0	17	48	22	< 1.0	< 1.0
TPH >C21-C40	N	2670	mg/kg	1.0	5.4	81	14	< 1.0	< 1.0
Total TPH >C6-C40	U	2670	mg/kg	10	23	130	36	< 10	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	1.3	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	0.12	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	0.90	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	0.51	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	1.8	3.5	1.2	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10	0.79	0.25	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	2.3	4.3	2.6	< 0.10	< 0.10
Pyrene	U	2700	mg/kg	0.10	2.2	4.2	2.6	< 0.10	< 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10	3.1	2.9	2.1	< 0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	2.3	3.5	2.3	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	2.0	3.0	2.3	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	0.35	1.2	0.92	< 0.10	< 0.10

Results shaded in grey relate to the Plot 7 cover system and have not been used in the risk assessment for the scrub area.

Results - Soil

Project: NE3941F7 Plots 7 & 8, Laund Road, Huddersfield

Client: Sub Surface	Chemtest Job No.:				22-08577	22-08577	22-08577	22-08577	22-08577
Quotation No.:	Chemtest Sample ID.:				1386476	1386477	1386478	1386479	1386480
	Client Sample ID.:				890	892	895	896	898
	Sample Location:				HD30	HD32	HD35	HD36	HD38
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.20	0.00	0.10	0.20	0.10
	Bottom Depth (m):				0.50	0.40	0.40	0.60	0.50
	Date Sampled:				25-Feb-2022	25-Feb-2022	25-Feb-2022	25-Feb-2022	25-Feb-2022
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD					
Benzo[a]pyrene	U	2700	mg/kg	0.10	1.0	1.8	1.1	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	0.75	1.3	1.2	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	1.4	0.46	0.40	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	0.78	1.2	1.8	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	18	31	19	< 2.0	< 2.0
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

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- D - Broken Container
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All water samples will be retained for 14 days from the date of receipt

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COVER SYSTEM PHOTOGRAPHS

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907		Photographs	
Site: PLOT 2 LAUND ROAD, HUDDERSFIELD		Job Number: NE3941F/2	
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED		Sheet: 1/4	
Engineer: NORTHERN DESIGN PARTNERSHIP			

COVER SYSTEM VERIFICATION PHOTOGRAPHS

HD1 REAR GARDEN





SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907

Photographs

Site: PLOT 2 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/2
Sheet:
2/4

COVER SYSTEM VERIFICATION PHOTOGRAPHS

FRONT HARD PAVING





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Sheet:
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COVER SYSTEM VERIFICATION PHOTOGRAPHS

FRONT HARD PAVING





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Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/2
Sheet:
4/4

COVER SYSTEM VERIFICATION PHOTOGRAPHS

FRONT HARD PAVING





SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907

Photographs

Site: PLOT 3 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/3
Sheet:
1/2

COVER SYSTEM VERIFICATION PHOTOGRAPHS

HD2





SUB SURFACE

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Photographs

Site: PLOT 3 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/3
Sheet:
2/2

COVER SYSTEM VERIFICATION PHOTOGRAPHS

FRONT HARD PAVING





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Photographs

Site: PLOT 4 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/4
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1/3

COVER SYSTEM VERIFICATION PHOTOGRAPHS

HD3





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Photographs

Site: PLOT 4 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/4
Sheet:
2/3

COVER SYSTEM VERIFICATION PHOTOGRAPHS

FRONT HARD PAVING PREPARATION



S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907		Photographs	
Site: PLOT 4 LAUND ROAD, HUDDERSFIELD		Job Number: NE3941F/4	
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED		Sheet: 3/3	
Engineer: NORTHERN DESIGN PARTNERSHIP			

COVER SYSTEM VERIFICATION PHOTOGRAPHS

FRONT HARD PAVING ON COMPLETION





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Photographs

Site: PLOT 5 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
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COVER SYSTEM VERIFICATION PHOTOGRAPHS

HD1





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Photographs

Site: PLOT 5 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
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Sheet:
2/2

COVER SYSTEM VERIFICATION PHOTOGRAPHS

FRONT HARD PAVING PREPARATION





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Photographs

Site: PLOT 6 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/6
Sheet:
1/2

COVER SYSTEM VERIFICATION PHOTOGRAPHS

HD1





SUB SURFACE

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Photographs

Site: PLOT 6 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/6
Sheet:
2/2

COVER SYSTEM VERIFICATION PHOTOGRAPHS

FRONT & SIDE HARD PAVING PREPARATION





SUB SURFACE

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Photographs

Site: PLOT 7 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/7
Sheet:
1/5

COVER SYSTEM VERIFICATION PHOTOGRAPHS

HD36





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Photographs

Site: PLOT 7 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/7
Sheet:
2/5

COVER SYSTEM VERIFICATION PHOTOGRAPHS

HD37





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Photographs

Site: PLOT 7 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/7
Sheet:
3/5

COVER SYSTEM VERIFICATION PHOTOGRAPHS

HD38





SUB SURFACE

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Photographs

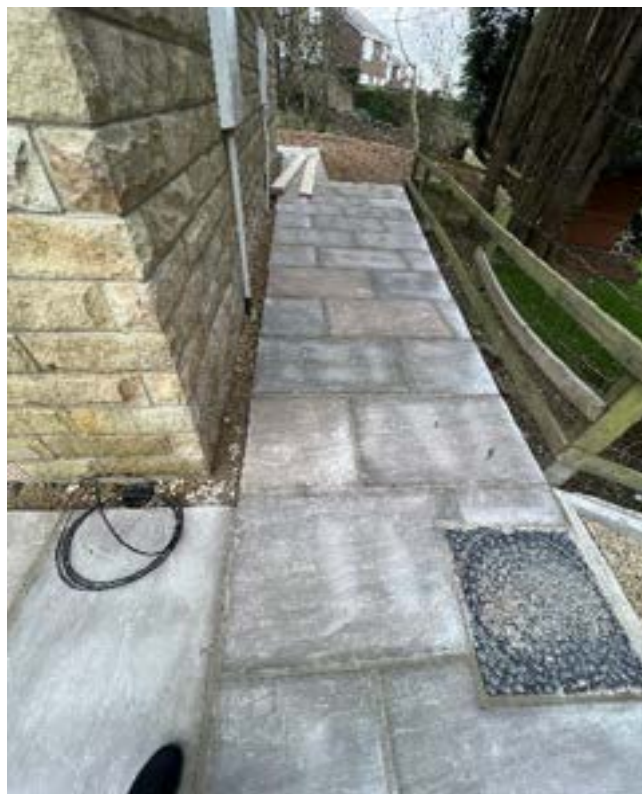
Site: PLOT 7 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/7
Sheet:
4/5

COVER SYSTEM VERIFICATION PHOTOGRAPHS



Preparation prior to placing aggregate and hard paving to the rear, with sub base shown to be 300+ mm below finished ground level.



Finished hard paving to the side.



Finished hard paving to the rear.

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Site: PLOT 7 LAUND ROAD, HUDDERSFIELD		Job Number: NE3941F/7	
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED		Sheet: 5/5	
Engineer: NORTHERN DESIGN PARTNERSHIP			

COVER SYSTEM VERIFICATION PHOTOGRAPHS

Completed hard paving and macadam driveway to the front.





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Photographs

Site: PLOT 8 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/8
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COVER SYSTEM VERIFICATION PHOTOGRAPHS

Prepared surface showing formation depth some 300mm below the final hard surface level.



Completed hard surface to rear



Completed hard surface to front





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Photographs

Site: PLOT 8 LAUND ROAD, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F/8
Sheet:
2/2

COVER SYSTEM VERIFICATION PHOTOGRAPHS

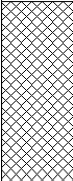
Completed hard surface to side of Plot 8.

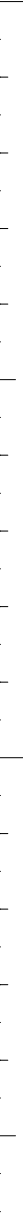
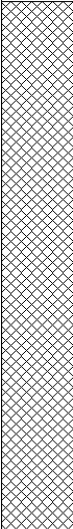
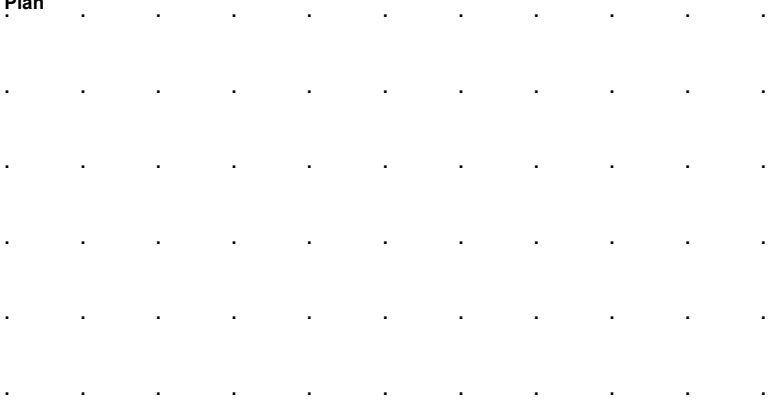


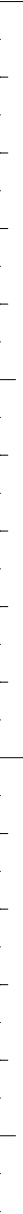
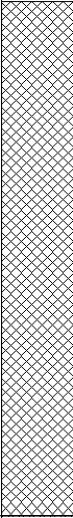
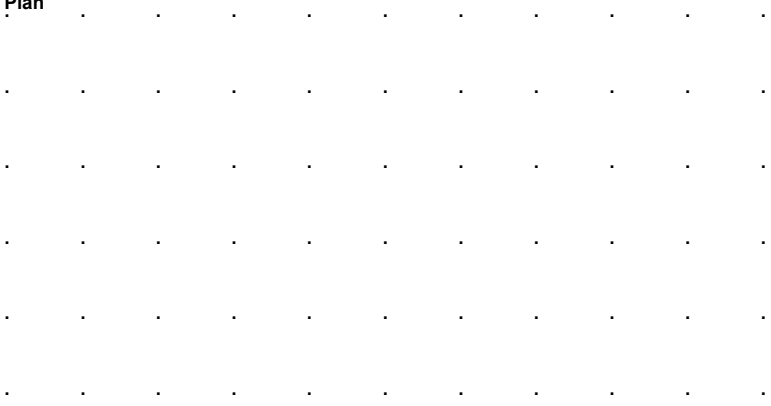
Completed Plot 8 rear at time of inspection (Plot 7 rear in foreground).

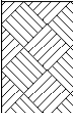
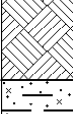
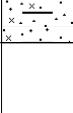
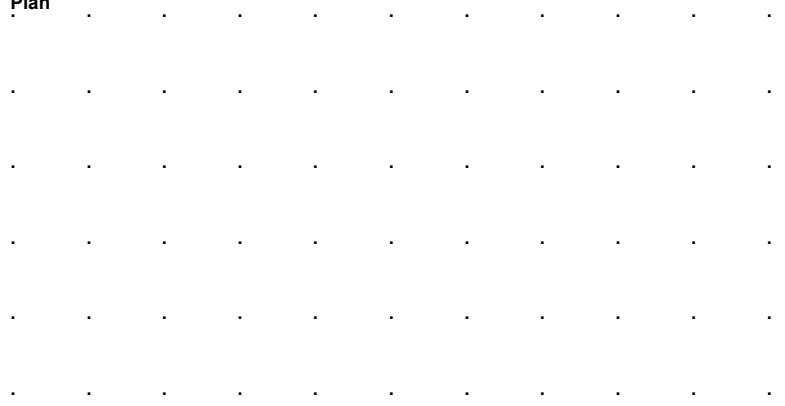


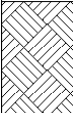
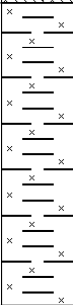
HAND DUG TRIAL PIT RECORD SHEETS

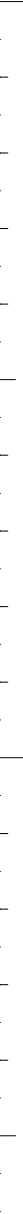
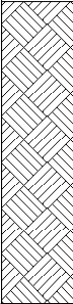
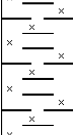
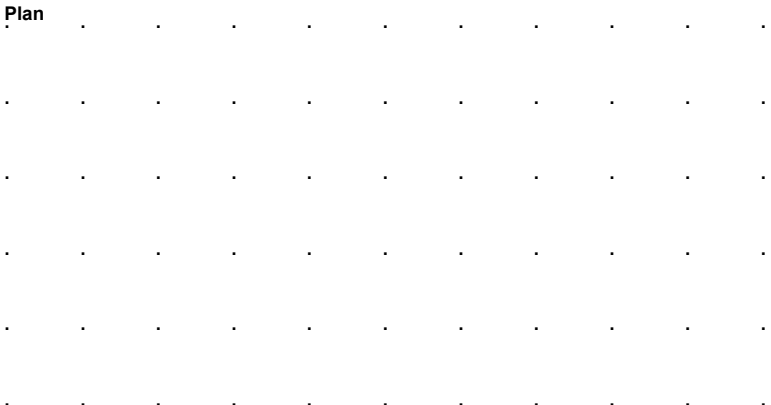
 SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907						Site PLOTS 2, 3, 4 LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD		Trial Pit Number HD1	
Excavation Method HAND DUG		Dimensions		Ground Level (mOD)		Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LTD		Job Number NE3941D	
		Location AS PLAN		Dates 25/08/2021		Engineer NORTHERN DESIGN PARTNERSHIP		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20-0.50	B		25/08/2021: DRY		(0.60) 0.60	MADE GROUND: brown slightly gravelly sandy topsoil (imported). Complete at 0.60m			
Plan .						Remarks Pit sides remained vertical and stable. No groundwater encountered. On completion backfilled with arisings.			
						Scale (approx) 1:25	Logged By DS/SJ	Figure No. NE3941D.HD1	

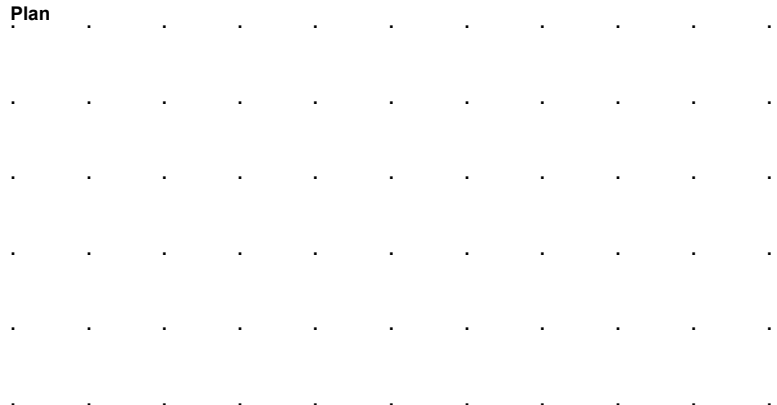
 SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907						Site PLOT 5, LAUND ROAD, HUDDERSFIELD		Trial Pit Number HD1	
Excavation Method HAND DUG TRIAL PIT (FOR COVER SYSTEM VERIFICATION)		Dimensions 0.5 x 0.5m		Ground Level (mOD)		Client CREATIVE DEVELOPMENTS LIMITED		Job Number NE3941F/5	
		Location As Shown on Fig.3		Dates 22/06/2022		Engineer NORTHERN DESIGN PARTNERSHIP		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.20-0.50	B				 (0.70)	MADE GROUND: imported brown slightly gravelly sandy topsoil.			
			22/06/2022:DRY		0.70	Complete at 0.70m			
Plan 						Remarks On completion backfilled with arisings.			
						Scale (approx) 1:10		Logged By DS/DJ	Figure No. NE3941F/7.HD30

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Excavation Method HAND DUG TRIAL PIT (FOR COVER SYSTEM VERIFICATION)		Dimensions 0.5 x 0.5m		Ground Level (mOD)		Client CREATIVE DEVELOPMENTS LIMITED		Job Number NE3941F/6	
		Location As Shown on Fig.3		Dates 22/06/2022		Engineer NORTHERN DESIGN PARTNERSHIP		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.00-0.50	B				 (0.68)	MADE GROUND: imported brown slightly gravelly sandy topsoil.			
			22/06/2022: DRY		0.68	Complete at 0.68m			
Plan 						Remarks On completion backfilled with arisings.			
						Scale (approx) 1:10	Logged By DS/DJ	Figure No. NE3941F/7.HD30	

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Excavation Method HAND DUG TRIAL PIT (IN ROUGH GRASS AREA)		Dimensions 0.5 x 0.5m		Ground Level (mOD)		Client CREATIVE DEVELOPMENTS LIMITED		Job Number NE3941F/7		
		Location As Shown on Fig.3		Dates 25/02/2022		Engineer NORTHERN DESIGN PARTNERSHIP		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
0.20-0.50	B		25/02/2022:DRY			Fibrous TOPSOIL (leaf mould).				
					0.15	TOPSOIL.				
					0.25					
					0.40	Dark brown silty CLAY.				
					0.50	...at 0.50m sandstone obstruction.				
						Complete at 0.50m				
Plan 						Remarks On completion backfilled with arisings.				
						Scale (approx) 1:10	Logged By DS/DJ	Figure No. NE3941F/7.HD30		

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Excavation Method HAND DUG TRIAL PIT (IN ROUGH GRASS AREA)		Dimensions 0.5 x 0.5m		Ground Level (mOD)		Client CREATIVE DEVELOPMENTS LIMITED		Job Number NE3941F/7		
		Location As Shown on Fig.3		Dates 25/02/2022		Engineer NORTHERN DESIGN PARTNERSHIP		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
0.15-0.40	B				(0.15) 0.15 (0.40) 0.55	TOPSOIL	 			
						Brown silty CLAY.				
			25/02/2022:DRY			...at 0.55m tree root obstruction. Complete at 0.55m				
Plan .						Remarks On completion backfilled with arisings.				
						Scale (approx) 1:10	Logged By DS/DJ	Figure No. NE3941F/7.HD30		

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Excavation Method HAND DUG TRIAL PIT ROUGH GRASS AREA		Dimensions 0.5 x 0.5m		Ground Level (mOD)		Client CREATIVE DEVELOPMENTS LIMITED		Job Number NE3941F/7	
		Location As Shown on Fig.3		Dates 25/02/2022		Engineer NORTHERN DESIGN PARTNERSHIP		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.00-0.40	B					TOPSOIL.			
					0.40	Friable brown silty CLAY.			
			25/02/2022:DRY		0.60	Complete at 0.60m			
Plan 						Remarks On completion backfilled with arisings.			
						Scale (approx) 1:10	Logged By DS/DJ	Figure No. NE3941F/7.HD30	

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Excavation Method HAND DUG TRIAL PIT (IN ROUGH GRASS AREA)		Dimensions 0.5 x 0.5m		Ground Level (mOD)		Client CREATIVE DEVELOPMENTS LIMITED		Job Number NE3941F/7		
		Location As Shown on Fig.3		Dates 25/02/2022		Engineer NORTHERN DESIGN PARTNERSHIP		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
0.10-0.40	B				(0.10)	Fibrous TOPSOIL (leaf mould).				
					0.10	Dark brown silty CLAY.				
					(0.30)					
					0.40	Brown silty CLAY.				
					(0.10)	...at 0.50m brown siltstone obstruction.				
					0.50	Complete at 0.50m				
Plan 						Remarks On completion backfilled with arisings.				
						Scale (approx) 1:10	Logged By DS/DJ	Figure No. NE3941F/7.HD30		

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Excavation Method HAND DUG TRIAL PIT (IN ROUGH GRASS AREA)		Dimensions 0.5 x 0.5m		Ground Level (mOD)		Client CREATIVE DEVELOPMENTS LIMITED		Job Number NE3941F/7		
		Location As Shown on Fig.3		Dates 25/02/2022		Engineer NORTHERN DESIGN PARTNERSHIP		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
0.00-0.30	B					TOPSOIL.				
					(0.30)					
					0.30 (0.05) 0.35	Very weak grey and brown very thinly bedded highly weathered MUDSTONE. ...at 0.50m sandstone obstruction.				
			25/02/2022:DRY			Complete at 0.35m				
Plan					Remarks					
.					On completion backfilled with arisings.					
.										
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.										
Scale (approx)			Logged By		Figure No.					
1:10			DS/DJ		NE3941F/7.HD30					

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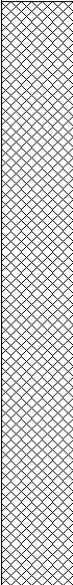
LAUND ROAD, HUDDERSFIELD

Job
Number
NE3941F/7

Job Number
NE3941F/7

Sheet
1/1

Plan 	Remarks		
	On completion backfilled with arisings.		
	Scale (approx) 1:10	Logged By DS/DJ	Figure No. NE3941F/7.HD30

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Excavation Method HAND DUG TRIAL PIT (FOR COVER SYSTEM VERIFICATION)		Dimensions 0.5 x 0.5m		Ground Level (mOD)		Client CREATIVE DEVELOPMENTS LIMITED		Job Number NE3941F/7	
		Location As Shown on Fig.3		Dates 25/02/2022		Engineer NORTHERN DESIGN PARTNERSHIP		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.20-0.60	B					MADE GROUND: imported brown slightly gravelly sandy topsoil.			
			25/02/2022: DRY		0.78	Complete at 0.78m			
Plan 						Remarks On completion backfilled with arisings.			
						Scale (approx) 1:10		Logged By DS/DJ	Figure No. NE3941F/7.HD30

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Excavation Method HAND DUG TRIAL PIT (FOR COVER SYSTEM VERIFICATION)		Dimensions 0.5 x 0.5m		Ground Level (mOD)		Client CREATIVE DEVELOPMENTS LIMITED		Job Number NE3941F/7		
		Location As Shown on Fig.3				Dates 25/02/2022		Engineer NORTHERN DESIGN PARTNERSHIP		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water	
0.00-0.40	B									

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GAS PROTECTION VALIDATION RECORD



SUB SURFACE LIMITED

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

REMEDIATION VERIFICATION

Site: PLOT 2, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941F-2
Sheet:
1/1

GAS PROTECTION VALIDATION RECORD

Plot Number(s): 2
Building Description: 2 Storey Detached Residential House
Inspected By: DS **Date:** 31/03/2021
Protection Type: Passive membrane and sub floor ventilation
Foundation Type: Suspended Floor
Photographed Y / N: Y

Ventillated Sub-Floor

Component	Inspected Y/N	Notes/recommendations
Void Former Type	X	N/A
Void Height	✓	0.30m to 0.40m where checked. Ground surface comprised 6F2 made up of crushed sandstone gravel and occasional brick.
Gravel	X	N/A
Vent Pipe	X	N/A
Airbricks	✓	Spacing varied between 1.5m and 2.4m centres.
Sleeper Walls	✓	Vented at pipe conduits.
Vent Trench	X	N/A

Gas Barrier

Component	Inspected Y/N	Notes/Recommendations
Membrane	✓	Visqueen Gas Membrane Product Code: FNPYF659. Inspected in secure store prior to installation.
Extent	✓	Full footprint of the plot.
Underside	✓	Resting directly on beam and block suspended floor.
Slab/membrane condition	✓	In good condition with no visible damage or repairs.
Laps and Joints	✓	All joints were lapped with double sided tape between sheets with minum 200mm overlap, and taped on top with duct tape.
DPC	✓	200mm to 300mm projection, all in good condition.
Service entries and seals	✓	All sealed and over-taped as per membrane joints.
Cavity	✓	Membrane taken across cavity in all areas.

Remarks: This Plot has Passed / Failed: PASSED Engineer: D. Simpson BSc (Hons), FGS Signed: *D Simpson*



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SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

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REMEDIATION VERIFICATION

Site: LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941E/3
Sheet:
1/1

GAS PROTECTION VALIDATION RECORD

Plot Number(s): 3
Building Description: 2 Storey Semi-Detached Residential House
Inspected By: DS **Date:** 13/07/2021
Protection Type: Passive membrane and sub floor ventilation
Foundation Type: Suspended Floor
Photographed Y / N: Y

Ventillated Sub-Floor

Component	Inspected Y/N	Notes/recommendations
Void Former Type	X	N/A
Void Height	✓	0.30m where checked. Ground surface was dry and comprised part crushed sandstone gravel and part clay with occasional brick fragments.
Gravel	X	N/A
Vent Pipe	X	N/A
Airbricks	✓	Spacing varied between 1.5m and 2.4m centres.
Sleeper Walls	✓	Vented at pipe conduits.
Vent Trench	X	N/A

Gas Barrier

Component	Inspected Y/N	Notes/Recommendations
Membrane	✓	Visqueen Gas Membrane Product Code: FNPYF659. Inspected in secure store prior to installation.
Extent	✓	Full footprint of the plot.
Underside	✓	Resting directly on beam and block suspended floor.
Slab/membrane condition	✓	In good condition with no visible damage or repairs.
Laps and Joints	✓	All joints were lapped with double sided tape between sheets with minum 200mm overlap, and taped on top with duct tape.
DPC	✓	200mm to 300mm projection, all in good condition.
Service entries and seals	✓	All sealed and over-taped as per membrane joints.
Cavity	✓	Membrane taken across cavity in all areas, including the step down between plots.

Remarks: This Plot has Passed / Failed: PASSED Engineer: D. Simpson BSc (Hons), FGS Signed: *D Simpson*



SUB SURFACE LIMITED

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

REMEDIATION VERIFICATION

Site: LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
NE3941C
Sheet:
1/1

GAS PROTECTION VALIDATION RECORD

Plot Number(s): 4
Building Description: 2 Storey Semi-Detached Residential House
Inspected By: DS
Date: 13/07/2021
Protection Type: Passive membrane and sub floor ventilation
Foundation Type: Suspended Floor
Photographed Y / N: Y

Ventillated Sub-Floor

Component	Inspected Y/N	Notes/recommendations
Void Former Type	X	N/A
Void Height	✓	0.30m where checked. Ground surface was dry and comprised part crushed sandstone gravel and part clay with occasional brick fragments.
Gravel	X	N/A
Vent Pipe	X	N/A
Airbricks	✓	Spacing varied between 1.5m and 2.4m centres.
Sleeper Walls	✓	Vented at pipe conduits.
Vent Trench	X	N/A

Gas Barrier

Component	Inspected Y/N	Notes/Recommendations
Membrane	✓	Visqueen Gas Membrane Product Code: FNPYF659. Inspected in secure store prior to installation.
Extent	✓	Full footprint of the plot.
Underside	✓	Resting directly on beam and block suspended floor.
Slab/membrane condition	✓	In good condition with no visible damage or repairs.
Laps and Joints	✓	All joints were lapped with double sided tape between sheets with minum 200mm overlap, and taped on top with duct tape.
DPC	✓	200mm to 300mm projection, all in good condition.
Service entries and seals	✓	All sealed and over-taped as per membrane joints.
Cavity	✓	Membrane taken across cavity in all areas, including the step down between plots.

Remarks: This Plot has Passed / Failed: PASSED Engineer: D. Simpson BSc (Hons), FGS Signed: *D Simpson*

GAS MEMBRANE SPECIFICATION

Visqueen Gas Barrier

Features and benefits

- BBA certified - third party accreditation
- Complies with BS 8485:2015 + A1:2019 - industry standard for methane and carbon dioxide protection
- Flexible - easy to detail and install on site
- Multi functional - also acts as a radon and damp proof membrane
- Dual jointing methods - lap joints can be taped or heat welded

Product description

Visqueen Gas Barrier is a multi-layer reinforced polyethylene gas barrier with a 20 micron aluminium foil. The barrier is coloured blue on the upper surface and silver on the reverse. The product is supplied in single wound rolls (not folded), 2m x 50m.

Approvals and standards

- Third party accreditation (BBA 13/5069)
- Conforms to the specification requirements of BS 8485:2015 + A1:2019
- Suitable for all Characteristic Gas Situation (CS) ground gas regimes
- Conforms to the specification requirements of NHBC Amber 1 and Amber 2 applications
- Conforms to the specification requirements of BR 211:2015
- CE Mark EN 13967:2017
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 18001:2007
- Environmental Management System ISO 14001:2015

Usage

Visqueen Gas Barrier is suitable for use in all types of buildings to prevent the ingress of harmful levels of ground gases e.g. methane, carbon dioxide and radon.

The barrier can be positioned above or below a solid concrete ground floor slab or above a precast suspended segmental ground floor system, e.g. beam and block floor.

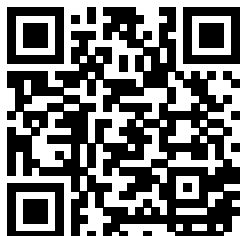
The barrier can also be used as a high performance radon membrane and/or damp proof membrane.

The product is not intended for use where there is a risk of hydrostatic pressure.

System components

- VisqueenPro Double Sided Jointing Tape, 50mm x 10m
- Visqueen Gas Resistant Foil Lap Tape, 75mm x 50m
- Visqueen GR Lap Tape, 150mm x 10m
- Visqueen Ultimate Top Hat Units
- Visqueen Preformed Units
- VisqueenPro Detailing Strip, 300mm x 10m, 500mm x 10m
- Visqueen TreadGUARD 300, 2m x 75m
- Visqueen TreadGUARD 1500, 1m x 2m

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Professional Indemnity Design
Full Design Liability for Structural Waterproofing
and Gas Protection

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PROFESSIONAL SERVICES

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Visqueen Gas Barrier

Storage and handling

Visqueen Gas Barrier should be stored horizontally, under cover in its original packaging.

Care should be taken when handling the product in line with current manual handling regulations.

Preparation

Visqueen Gas Barrier should be installed on a smooth continuous surface e.g. grouted beam and block floor, a compacted blinding layer e.g. 50mm thick sand blinding, or smooth concrete blinding. The substrate should be free from irregularities such as voids or protrusions.

The barrier can be cut with a sharp retractable safety knife or robust scissors.

When installing the membrane in demanding site conditions, use Visqueen GR Lap Tape in place of Visqueen Gas Resistant Foil Lap Tape.

Installation

Visqueen Gas Barrier should be loose laid on the substrate with the blue side up so as to avoid sunlight glare.

The barrier should be clean and dry at the time of jointing. It should be overlapped by at least 150mm, bonded with Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Foil Lap Tape.

Alternatively lap joints can be heat welded to achieve an effective seal. Welded lap joints can be less than 150mm provided the joint integrity is not compromised.

Airtight seals should be formed around all service entry points. Visqueen Preformed Top Hat Units should be used for sealing service entry pipes. The base of the top hat and the upstand should be bonded using Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Foil Lap Tape. The upstand should be secured with the supplied jubilee clip.

Forming an effective barrier to gases may give rise to complex three-dimensional detailing where, it is recommended Visqueen Preformed Units are used e.g. corners. Alternatively Visqueen Pro Detailing Strip can be used to seal awkward junctions.

If the barrier is punctured or perforated a patch of the same material should be lapped at least 150mm beyond the limits of the puncture and bonded with Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Foil Lap Tape. Alternatively a patch can be formed using Visqueen Pro Detailing Strip and lapped at least 150mm beyond the extents of the puncture.

The barrier should be covered by a protective layer as soon as possible after installation to prevent damage e.g. from following trades. Care should be taken to ensure that the membrane is not punctured, stretched or displaced when applying a screed or final floor covering. A minimum thickness of 50mm screed is recommended. When reinforced concrete is to be laid over the barrier the wire reinforcements and spacers must be prevented from puncturing the barrier. Where there is a high risk of potential damage, the barrier should be covered with Visqueen TreadGuard protection, screed, or other approved protection material before positioning the reinforcement.

Usable temperature range

It is recommended that Visqueen Gas Barrier and all associated system components should not be installed below 5°C.

Additional information

When used in accordance BS8485:2015 + A1:2019 a subfloor ventilation system or pressure relief maybe required
Where hydrocarbon or VOC contamination is present use Visqueen Ultimate VOC or HC Blok gas protection systems
To assist build sequencing, Visqueen GR DPC is available for gas protection through the wall constructions
For suspended beam and block floor detailing see GB-01
Visqueen Preformed Top Hat Units should be used at service pipe penetrations see GB-51
For internal and external corners Visqueen Ultimate Preformed Units should be used see PFU-553
To seal around steel columns use Visqueen Pro Detailing Strip see GB-52
For additional detailing information, contact Visqueen Technical Services +44 (0) 333 202 6800

The information in this datasheet was correct at the time of publication. It is the user's responsibility to obtain the latest version of the datasheet as it is updated on a regular basis. The information contained in the latest datasheet supersedes all previously published editions.

Visqueen Gas Barrier

Property	Test method	Units	Compliance criteria	Result
Dimensions	EN 1848-2	m		2 x 50
Overall thickness including scrim mesh	EN 1849-2	mm	+/-10%	0.52
Mass	EN 1849-2	g/m ²	-0%/+5%	400
Tensile strength - MD	EN 12311	N	MLV	350
Tensile strength - CD	EN 12311	N	MLV	350
Tensile elongation - MD	EN 12311	%	MLV	20
Tensile elongation - CD	EN 12311	%	MLV	21
Joint strength	EN 12317-2	N	MLV	332
Watertightness 2kPa	EN 1928	-	Pass/Fail	Pass
Resistance to impact	EN 12691	mm	MDV	150
Dart impact	BS 2782	g	MDV	731
Low temperature flexibility	EN 495-5	°C	MDV	-40
Durability against ageing	EN 1296 and EN 1928	-	Pass/Fail	Pass
Durability chemical resistance	EN 1847	-	Pass/Fail	Pass
Resistance to tearing (nail shank) CD	EN 12310-1	N	MDV	358
Resistance to tearing (nail shank) MD	EN 12310-1	N	MDV	368
Resistance to static loading	EN 12730	kg	MLV	20
Water vapour transmission - resistance	EN 1931	MNs/g	MDV	7000
Water vapour transmission - permeability	EN 1931	g/m ² /d	MDV	0.03
Visible defects	EN 1850 -2	-	Pass/Fail	Pass
Reaction to fire	EN 13501-1	Class	MDV	F
BS 8485:2015 + A1:2019 testing requirements				
Mass	EN 1849-2	g/m ²	Average >370	400
Methane permeability	ISO 15105-1	mls/m ² /d/atm	Pass/Fail	<0.15
Puncture CBR	BS EN ISO 12236	N	MDV	1114
Tensiles yield strength MD	ASTM D4885-01	kN/m	MDV	12.5
Tensiles yield strength CD	ASTM D4885-02	kN/m	MDV	7.3
Resistance to static loading	EN 12730	kg	>MLV	20
Yield elongation CD	ASTM D4885-04	%	MDV	19
Tear resistance - trouser method A - MD	BS ISO 34-1	kN/m	MDV	48.2
Tear resistance - trouser method A - CD	BS ISO 34-1	kN/m	MDV	44.8
Tear resistance - angle method B - MD	BS ISO 34-1	N	MDV	53.5
Tear resistance - angle method B - CD	BS ISO 34-1	N	MDV	60.6

Health and safety information

Refer to the Visqueen Gas Barrier material safety datasheet (MSDS).

Visqueen Gas Barrier

About Visqueen

The Visqueen name has long been recognised as one of the leading manufacturers of high quality advanced membrane technologies and design based solutions by specifiers, distributors, builders merchants and contractors throughout the UK and Europe.

For further guidance on the Visqueen services shown below, please refer to the relevant section of the Visqueen website (www.visqueen.com) or contact Visqueen Technical Services on +44 (0) 333 202 6800 or enquiries@visqueen.com

Complete Range, Complete Solution



Structural
Waterproofing



Gas
Protection



Damp Proof
Membrane



Tapes



Damp Proof
Course



Stormwater



Vapour
Control

Visqueen Technical Support

Visqueen combine an extensive product portfolio with industry leading levels of service and support which includes guidance over the phone, bespoke CAD drawings to help with complex detailing, electronic NBS specifications and access to a dedicated team of highly knowledgeable and experienced field based Technical Support Managers.

Visqueen Technical Support is available to all our customers including architects, specifiers, distributors, builders merchants, contractors and end users. All of our technical team have been awarded the industry recognised qualification Certificated Surveyor in Structural Waterproofing (CSSW).

Visqueen CPD Seminars

The Visqueen Continuing Professional Development (CPD) Seminars provide up-to-date information on changes within Building Regulations/Building Standards and nationally recognised industry guidance affecting damp proofing, water vapour control, hazardous ground gas protection and below ground structural waterproofing.

The one hour seminars have been produced for design specialists within the construction sector and are delivered by our team of Technical Support Managers.

Visqueen PI designs and special projects

From initial design to the completed project, Visqueen are with you every step of the way. Whether it be hazardous ground gas protection and/or below ground waterproofing protection employing barrier, structurally integral or drained systems, Visqueen can offer professional indemnity (PI) insurance for bespoke Visqueen design solutions.

Visqueen Technical Support Managers work with all stakeholders to provide cost effective Visqueen solutions offering complete peace of mind throughout the construction phase and beyond.

Visqueen Training Academy

Based at our manufacturing facility in Derbyshire, the Visqueen Training Academy is available to support Visqueen customers throughout the UK by providing a wide range of both theory and practical skills related training.

Courses include one day product awareness training for our distributors and builders merchants to help them in their day-to-day jobs, through to intensive three day courses giving detailed hands-on training in the practical skills required for safe and robust product installation.

GAS MEMBRANE PHOTOGRAPHS

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907	Photographs
Site: PLOT 2 - 8 LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED Engineer: NORTHERN DESIGN PARTNERSHIP	Job Number: NE3941G Sheet: 1/1

Gas Membrane Products



Gas Barrier Membrane: Visqueen Gas Barrier



Visqueen DPM jointing tape

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Site: PLOT 2 LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD			Job Number: NE3941F/2
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED			Sheet: 1/2
Engineer: NORTHERN DESIGN PARTNERSHIP			

PLOT 2 PRESSURE RELIEF AND MEMBRANE INSTALLATION: 22-27/10/2020



Detail of sub floor void at service entry



DPC detail



Details of gas membrane during installation; crossing the cavity at the external walls and continuous beneath internal walls.



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Photographs

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Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:

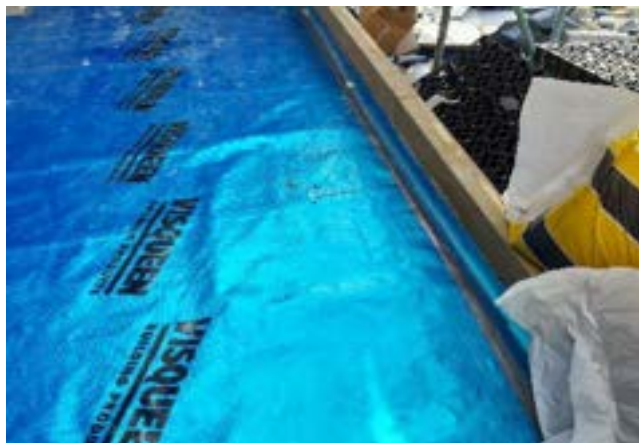
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Sheet:

2/2

PLOT 2 COMPLETED MEMBRANE:31/03/2021

Details of gas membrane installed in Plot 2 on completion.





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Photographs

Site: PLOT 3 LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD

Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED

Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:

NE3941F/3

Sheet:

1/2

PLOTS 3 & 4 MEMBRANE INSTALLATION: 25/03/2021

**Details of gas membrane in during installation to Plot 3 & 4;
crossing the cavity at the external walls and continuous beneath internal walls.**





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Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED

Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:

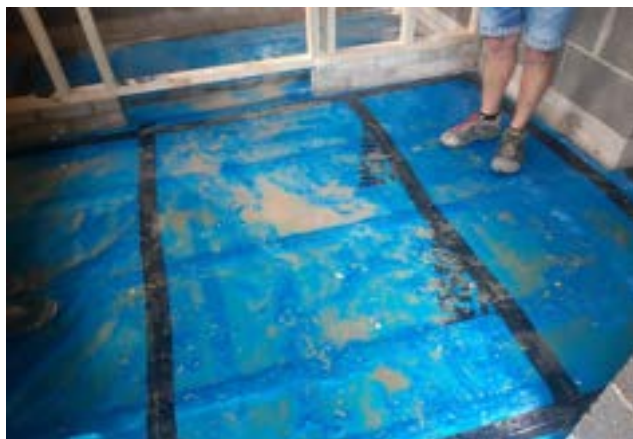
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PLOT 3 COMPLETED MEMBRANE: 13/07/2021

Details of gas membrane in Plot 3 on completion.





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Photographs

Site: PLOT 4 LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD

Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED

Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:

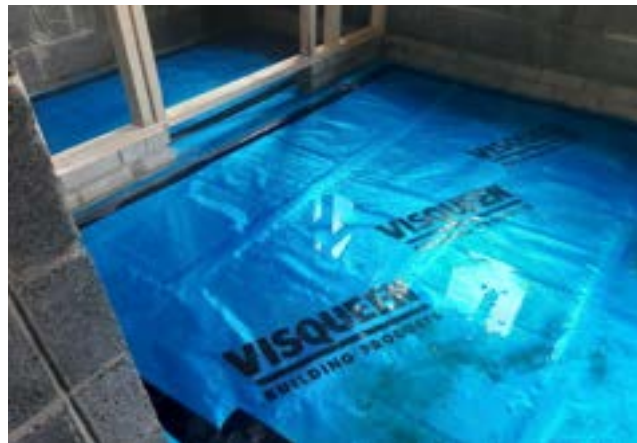
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PLOT 4 COMPLETED MEMBRANE: 13/07/2021

Details of gas membrane in Plot 4 on completion.



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Site: PLOT 2-4 LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED Engineer: NORTHERN DESIGN PARTNERSHIP	Job Number: NE3941G Sheet: 1/1

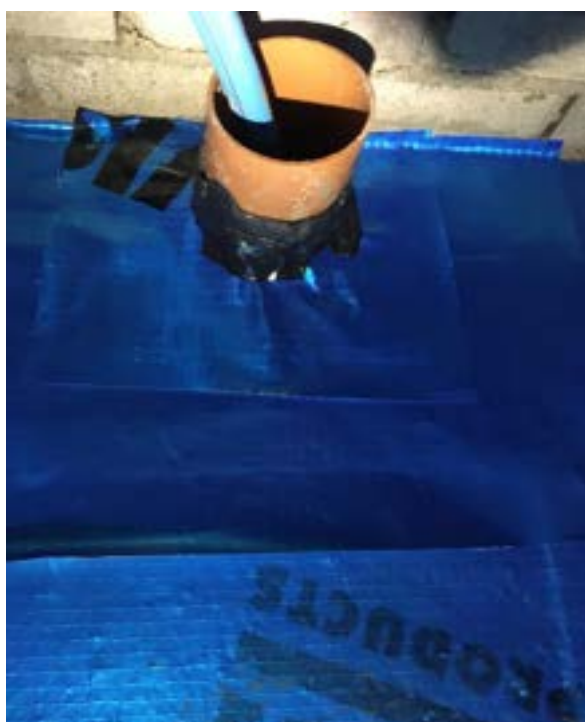
SERVICE PENETRATION SEALING METHODOLOGY



A small aperture is cut for the service.



double sided mastic sealing tape is placed around the aperture.



Rectangles of membrane of decreasing size are placed over the penetration with each one sealed to the service pipe and the underlying membrane using mastic sealant.



The seams between the layers and the interface with the service pipe are then taped over with single sided tape.

COMPLETED DEVELOPMENT PHOTOGRAPHS

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Site: PLOTS 2-8 LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED Engineer: NORTHERN DESIGN PARTNERSHIP	Job Number: NE3941G Sheet: 1/2

COMPLETED DEVELOPMENT PHOTOGRAPHS





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Photographs

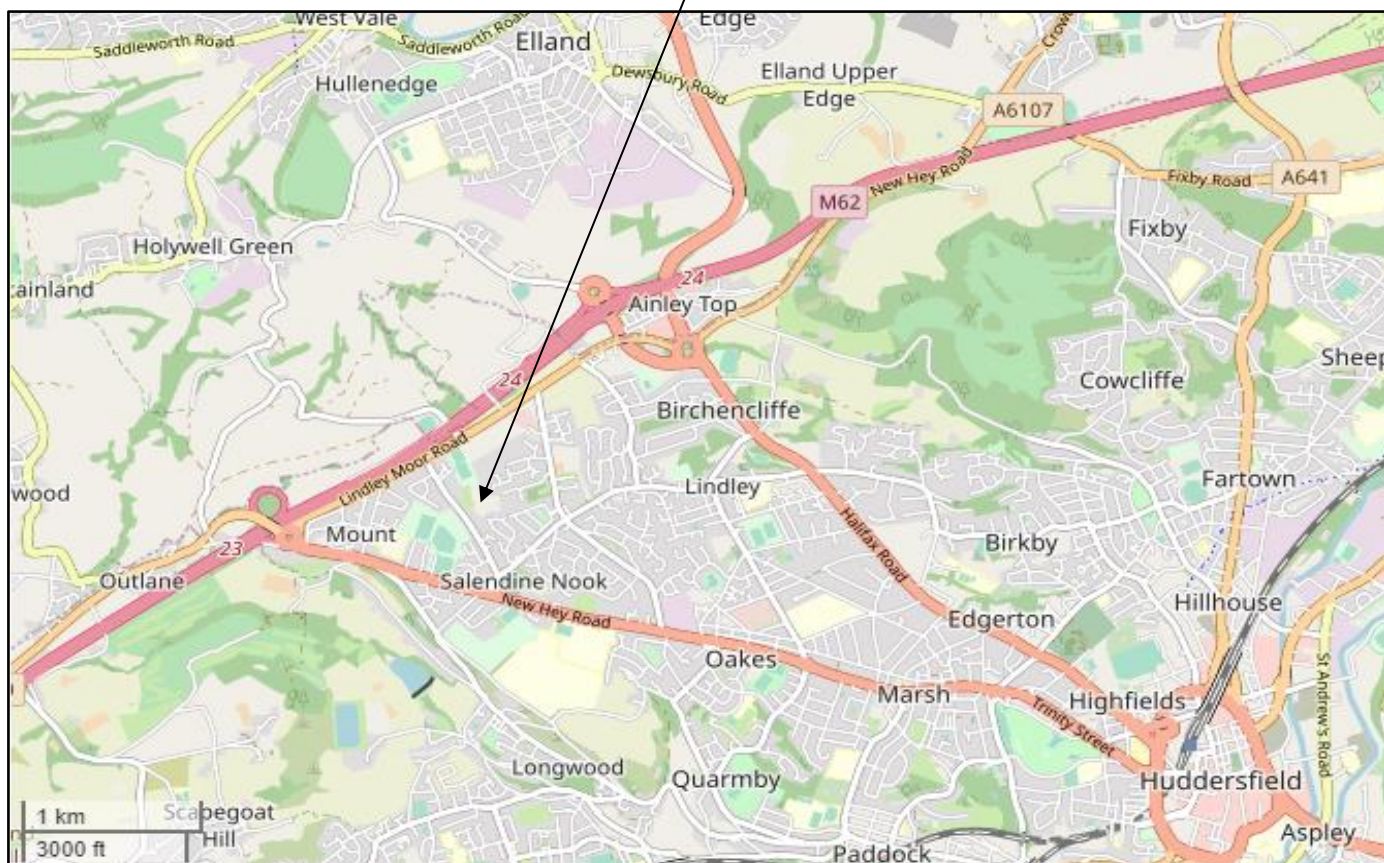
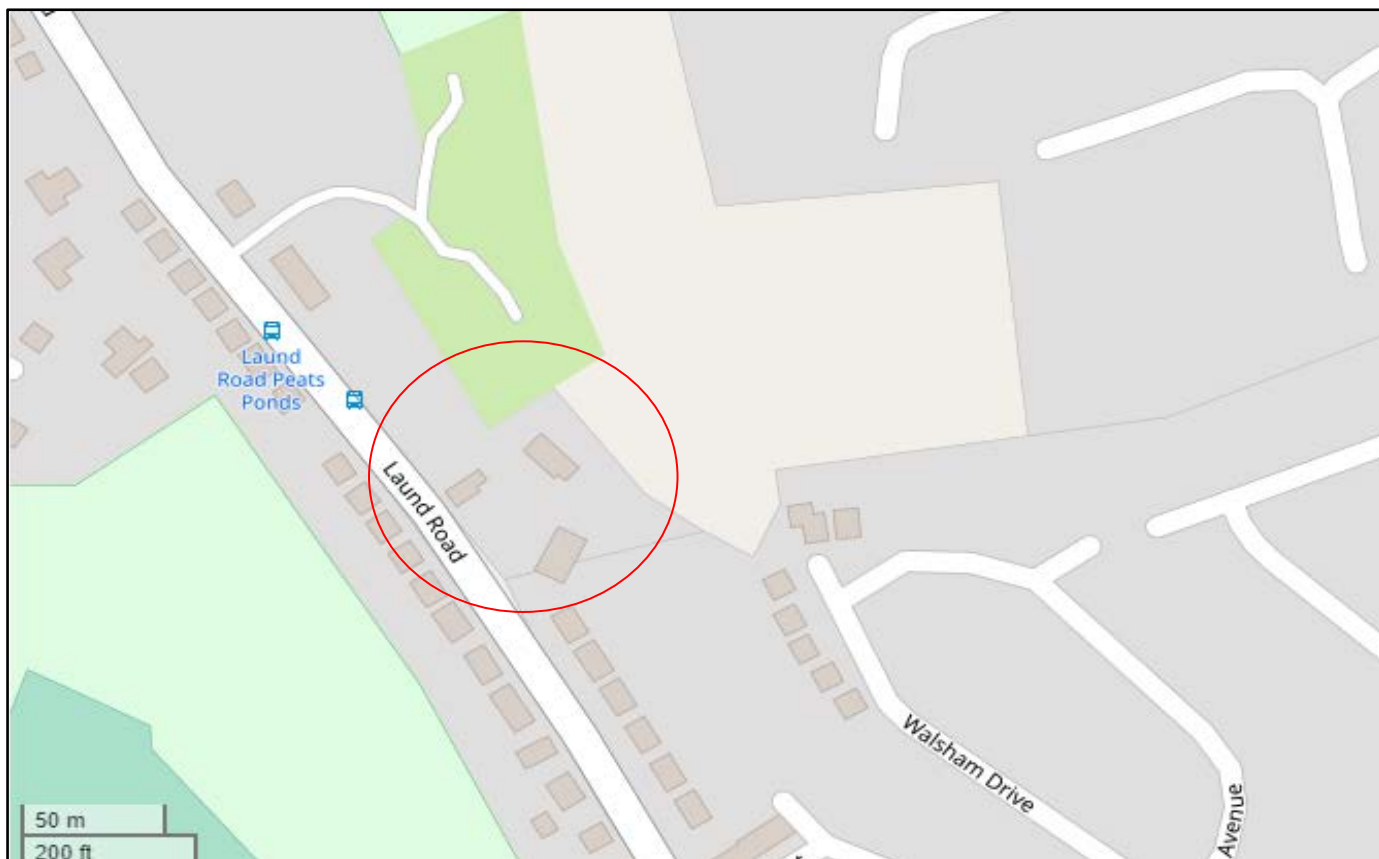
Site: PLOTS 2-8 LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD
Client: CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED
Engineer: NORTHERN DESIGN PARTNERSHIP

Job Number:
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Sheet:
2/2

COMPLETED DEVELOPMENT PHOTOGRAPHS



FIGURES



SUB SURFACE

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Site
PLOT 2, LAUND ROAD, SALENDINE NOOK,
HUDDERSFIELD

Client
CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED

Site Location

Date Drawn
15/09/2021

Date Checked



Job No.
NE3941F/2

Drawn By
DJ

Checked By

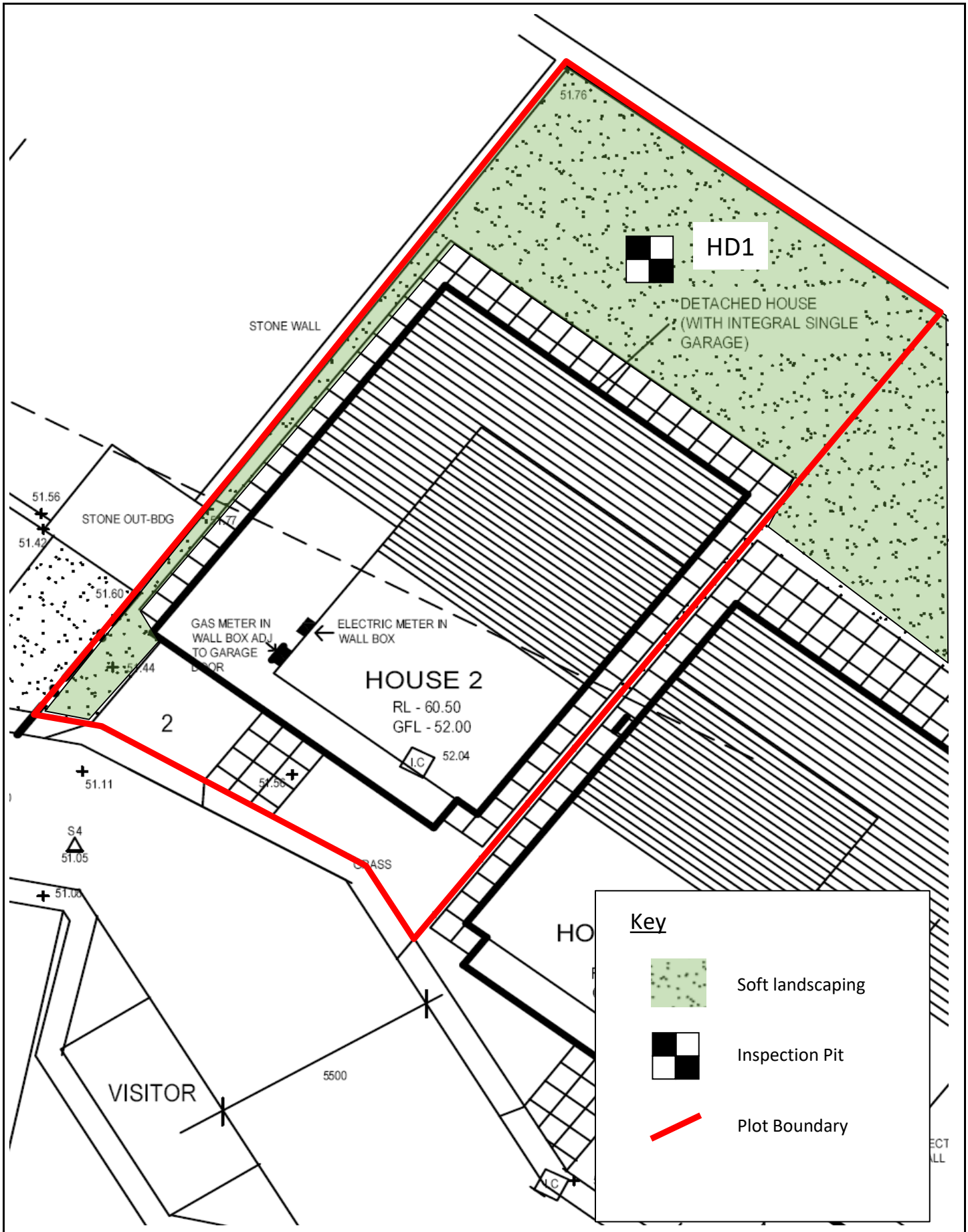
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Figure No.
1



Extract from Northern Design Partnership Drawing 1801/02/A

 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Proposed Site Layout & Plot 2 Location			
Site PLOT 2, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD	Date Drawn 23-Nov-21	Date Checked	Orientation 	Job No. NE3941F/2
Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED	Drawn By DJ	Checked By	Scale —	Figure No. 2

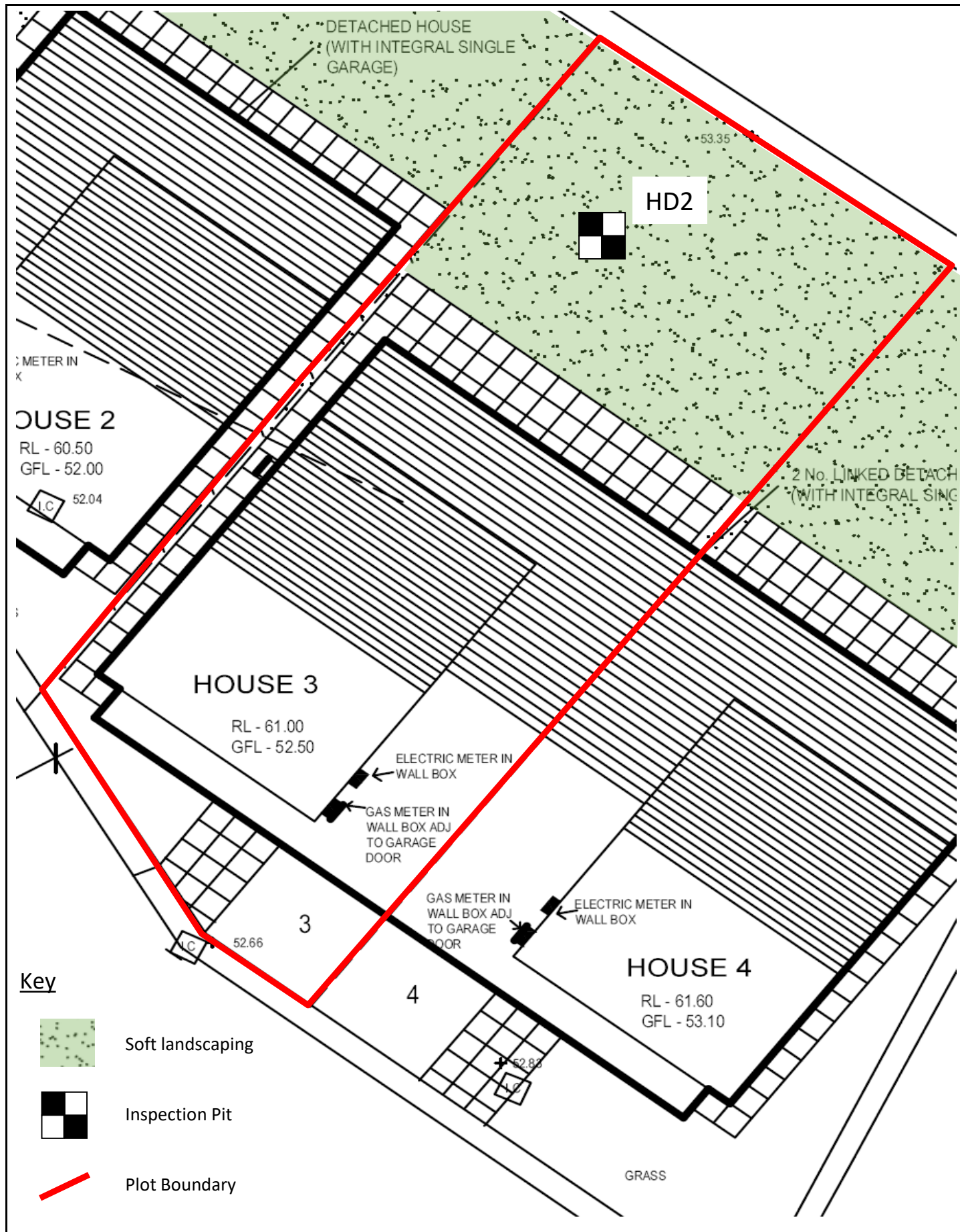


 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Plot 2 Layout & Location of Verification Pit			
Site PLOT 2, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD	Date Drawn 23-Nov-21	Date Checked	Orientation 	Job No. NE3941F/2
Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED	Drawn By DJ	Checked By	Scale —	Figure No. 3



Extract from Northern Design Partnership Drawing 1801/02/A

 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Proposed Site Layout & Plot 3 Location			
Site PLOTS 3, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD	Date Drawn 23-Nov-21	Date Checked	Orientation 	Job No. NE3941E/3
Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED	Drawn By DJ	Checked By	Scale —	Figure No. 4



	SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Plot 3 Layout & Location of Verification Pit			
Site PLOTS 3, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD	Date Drawn 23-Nov-21	Date Checked	Orientation 	Job No. NE3941E/3	
Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED	Drawn By DJ	Checked By	Scale —	Figure No. 5	



Extract from Northern Design Partnership Drawing 1801/02/A

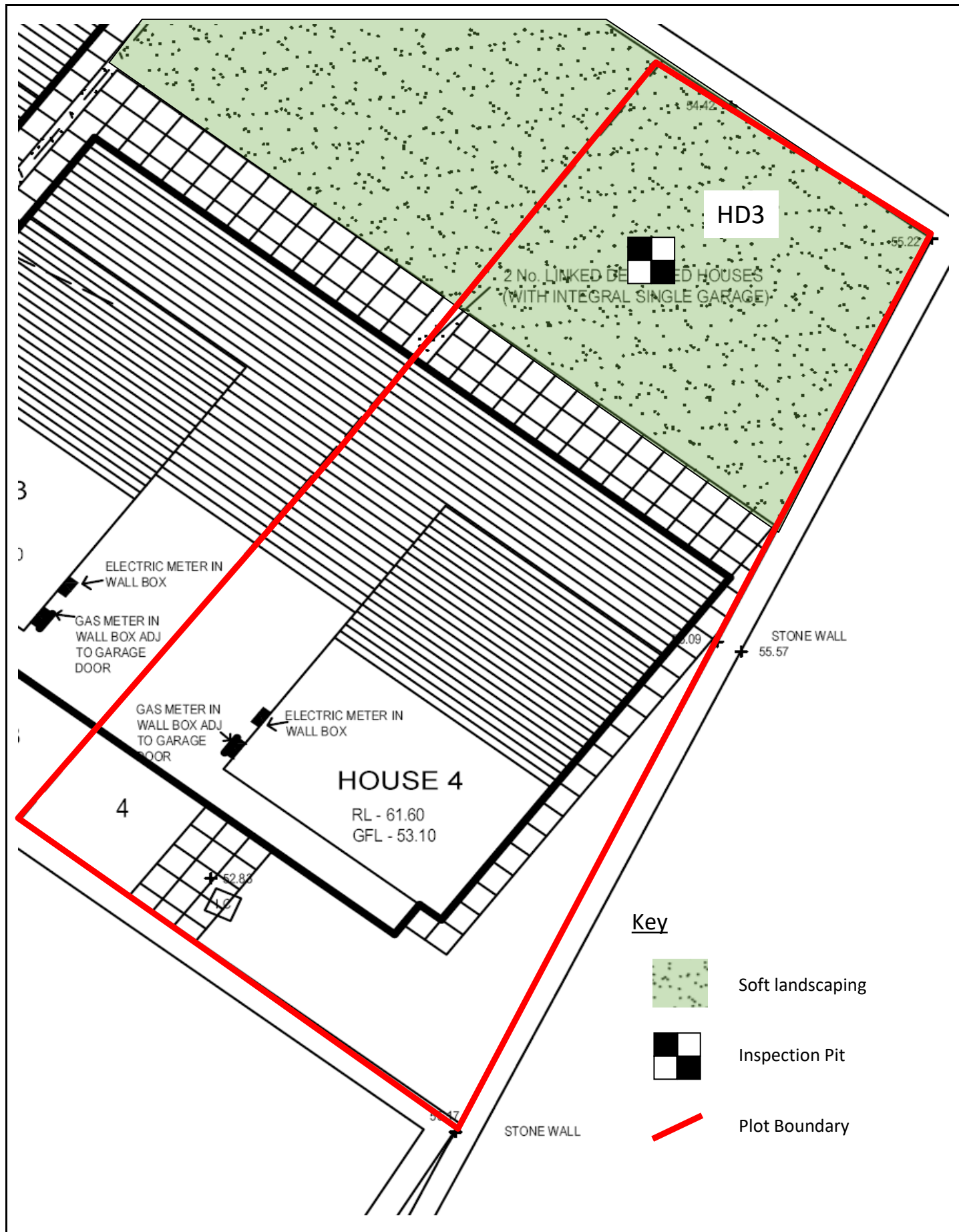


SUB SURFACE

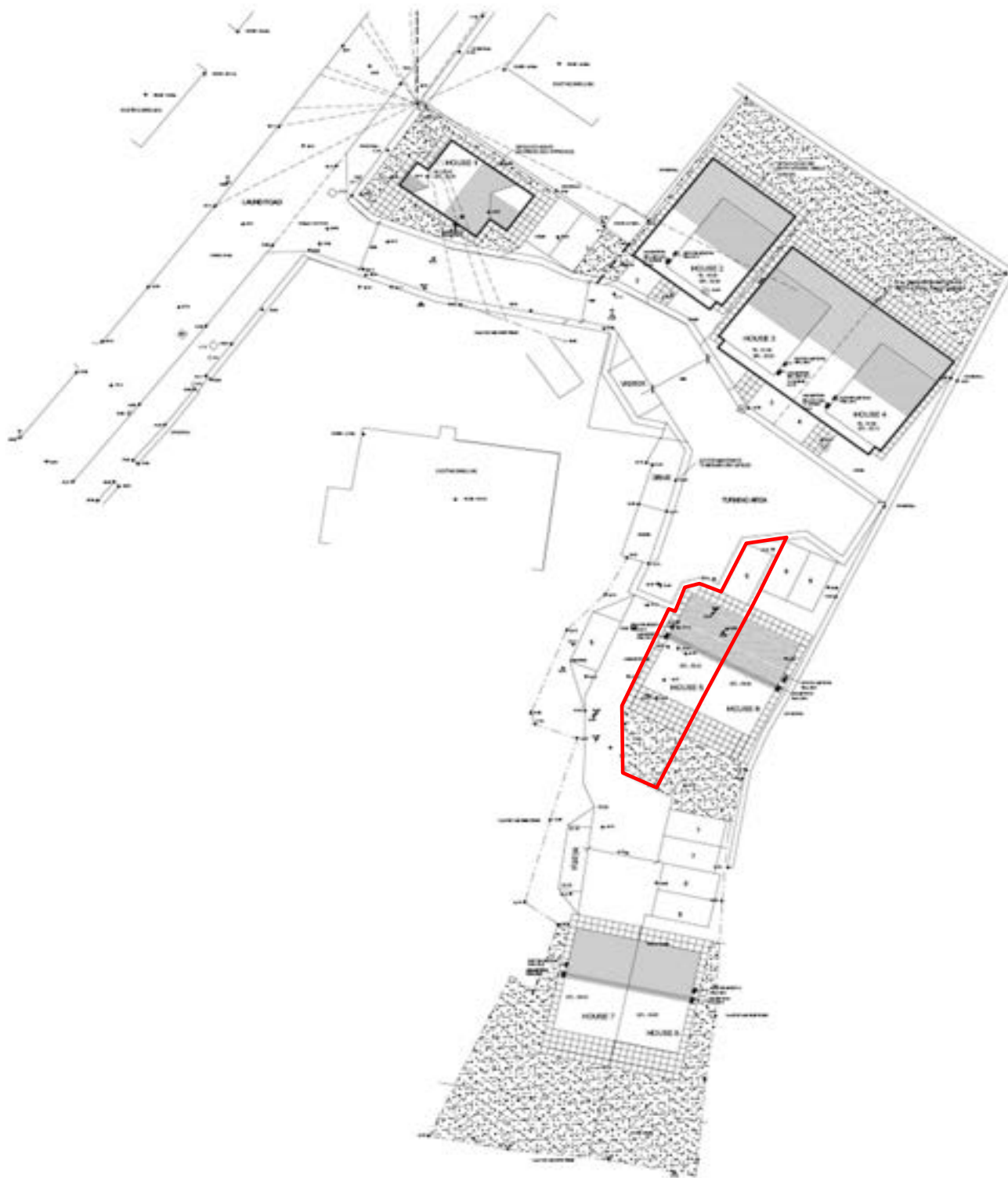
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Proposed Site Layout & Plot 4 Location

Site PLOT 4, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD	Date Drawn 23-Nov-21	Date Checked	Orientation 	Job No. NE3941F/4
Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED	Drawn By DJ	Checked By	Scale —	Figure No. 6



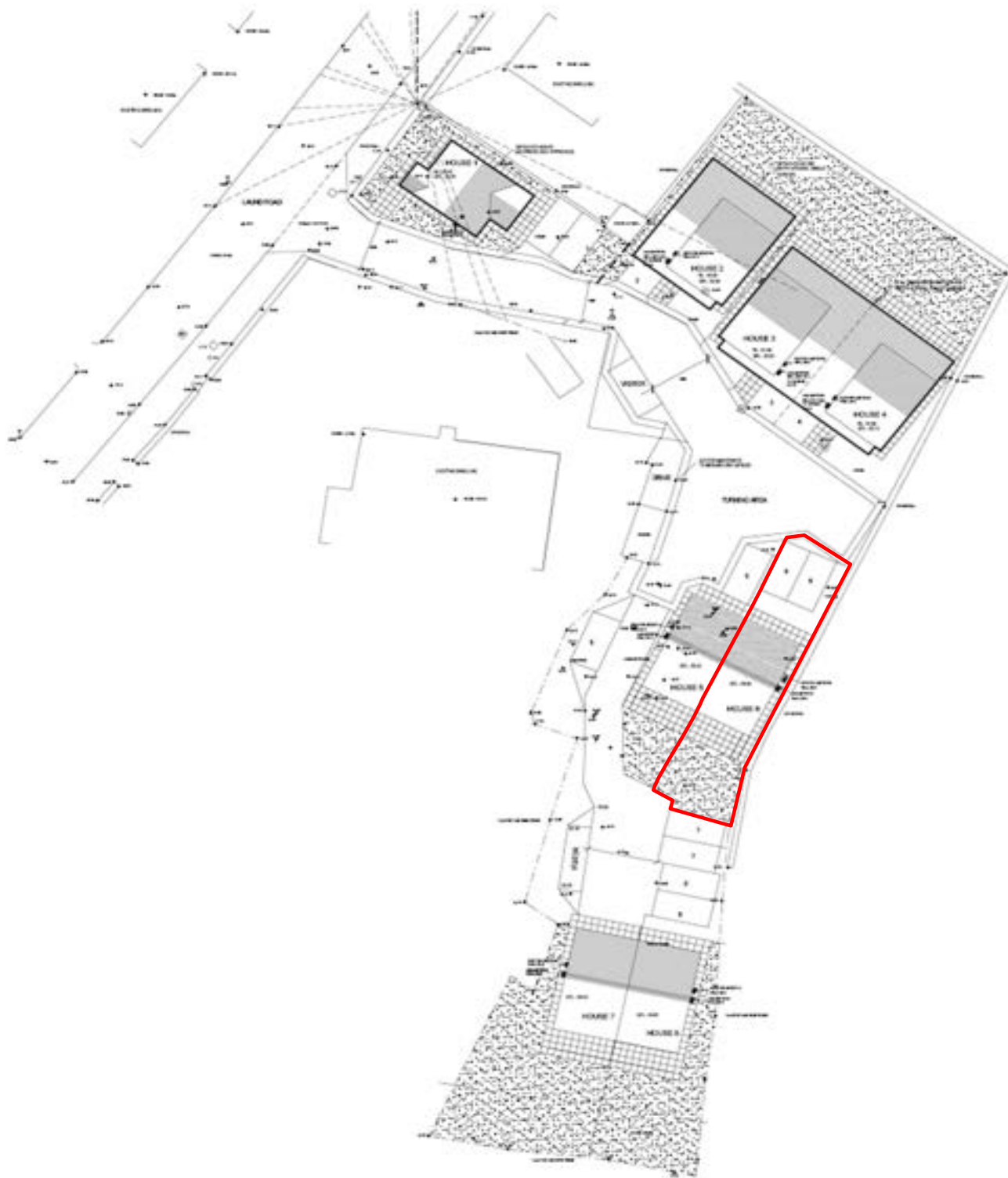
 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907		Plot 4 Layout & Location of Verification Pit			
Site PLOT 4, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD		Date Drawn 23-Nov-21	Date Checked	Orientation 	Job No. NE3941F/4
Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED		Drawn By DJ	Checked By	Scale —	Figure No. 7



Extract from Northern Design Partnership Drawing 1801/02/A

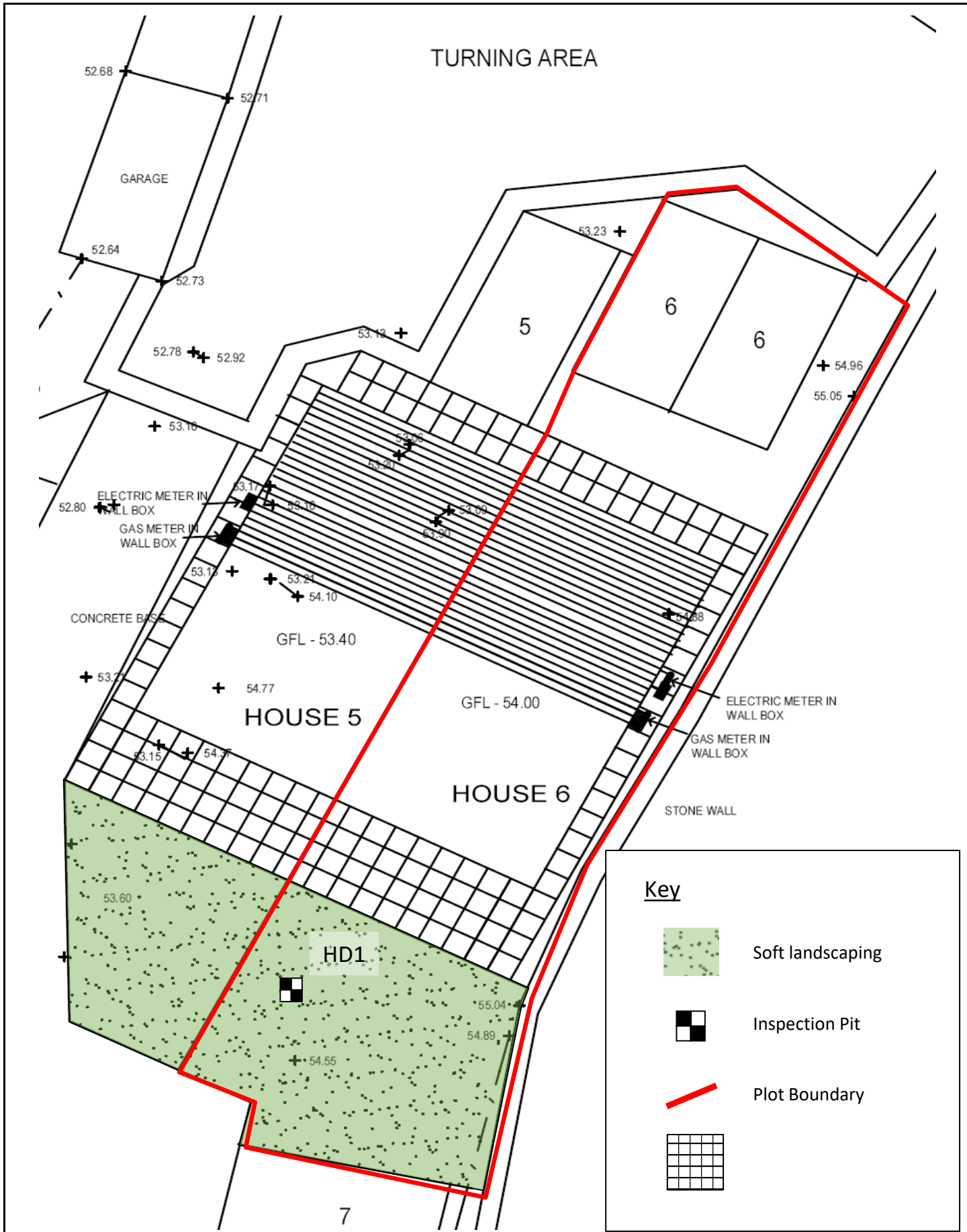
 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Proposed Site Layout & Plot 5 Location			
Site PLOT 5, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD	Date Drawn 23-Nov-21	Date Checked	Orientation 	Job No. NE3941F/5
Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED	Drawn By DJ	Checked By	Scale —	Figure No. 8





Extract from Northern Design Partnership Drawing 1801/02/A

 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Proposed Site Layout & Plot 6 Location			
Site PLOT 6, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD	Date Drawn 23-Nov-21	Date Checked	Orientation 	Job No. NE3941F/6
Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED	Drawn By DJ	Checked By	Scale —	Figure No. 10

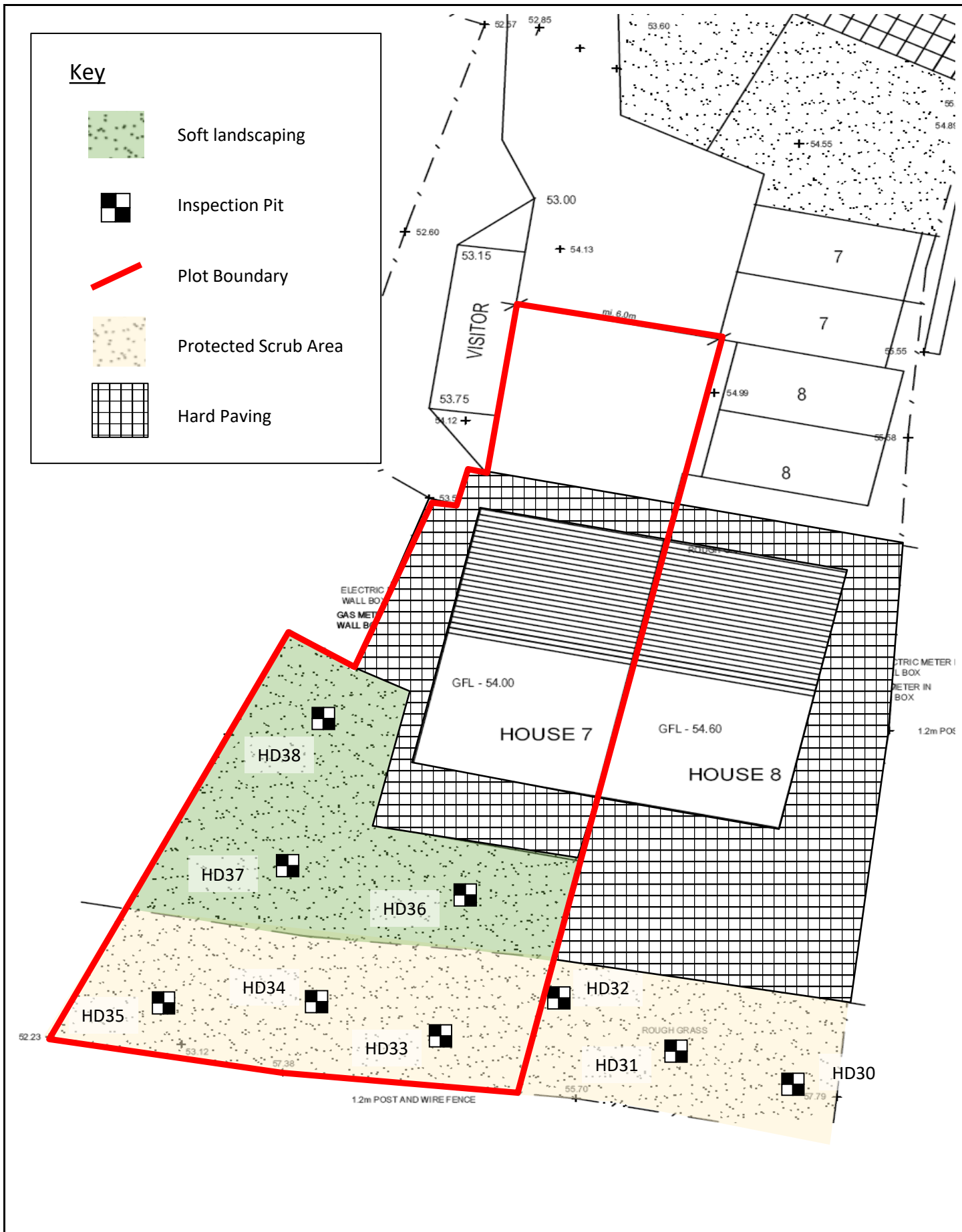


 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Plot 6 Layout & Locations of Hand Dug Pits			
Site PLOT 6, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD	Date Drawn 08-Jul-22	Date Checked	Orientation 	Job No. NE3941F/6
Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED	Drawn By DJ	Checked By	Scale —	Figure No. 11



Extract from Northern Design Partnership Drawing 1801/02/A

 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Proposed Site Layout & Plot 7 Location			
Site PLOT 7, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD	Date Drawn 23-Nov-21	Date Checked	Orientation 	Job No. NE3941F/7
Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED	Drawn By DJ	Checked By	Scale —	Figure No. 12



 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Plot 7 and Scrub Area Layout & Locations of Hand Dug Pits			
Site PLOT 7, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD	Date Drawn 23-Nov-21	Date Checked	Orientation 	Job No. NE3941F/7
Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED	Drawn By DJ	Checked By	Scale —	Figure No. 13



Extract from Northern Design Partnership Drawing 1801/02/A

 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Proposed Site Layout & Plot 8 Location			
Site PLOT 8, LAUND ROAD, SALENDINE NOOK, HUDDERSFIELD	Date Drawn 14-Apr-22	Date Checked	Orientation 	Job No. NE3941F/8
Client CREATIVE DEVELOPMENTS (HUDDERSFIELD) LIMITED	Drawn By DJ	Checked By	Scale —	Figure No. 14