



Our ref: 0665/L1/ds
Your ref: Tilsons Yard

23 June 2021

South Holland District Council
Council Offices
Priory Road
Spalding
Lincolnshire
PE11 2XE

**For the attention: Environmental Health
Ms Sue Armour**

Cc: Swann Edwards Architecture – fao Mr J Burton
Mr & Mrs M Parnell

Dear Sue

Re:H06-0372-21 & H06-0772-19: Erection of Dwelling In Association With Existing Plant Hire Business: Contaminated Land – Supplemental Ground Gas Risk Assessment.

Location: Tilsons Yard, Black Barn, Gedney Drove End.

0665-L1 Comments [SHDC Planning Portal] SHDC Environmental Health Tilsons Yard, Black Barn, Gedney Drove End PE12 9PA for Mr & Mrs Parnell.

1. Overview

The captioned site has been proposed for residential development which under current planning requirements, SHDC applied regarding 'contaminated land'. A Phase 1 Desk Study was completed and issued by this Author during and dated July 2018, which was subsequently followed by a Phase 2 investigation, again by this Author, and dated April 2020. Following submission of the Phase 2 report to SHDC with an application to

discharge the condition, the comments [blue text], which focused on the documented presence of a 'pond' on historic maps from the 1880's to the 1970s and in SHDCs opinion 'covered approximately 50% of the site', have been included in Section 2 of this correspondence were received and it was understood from discussion with the Client that further factual information was required by the Regulator, which would support a more detailed risk-based approach than that provided in the Phase 2 report with regard to the risk to human health from the pond which has been viewed as a potential source of ground gas and for which SHDC Environmental Health suggested 'further investigation' was appropriate.

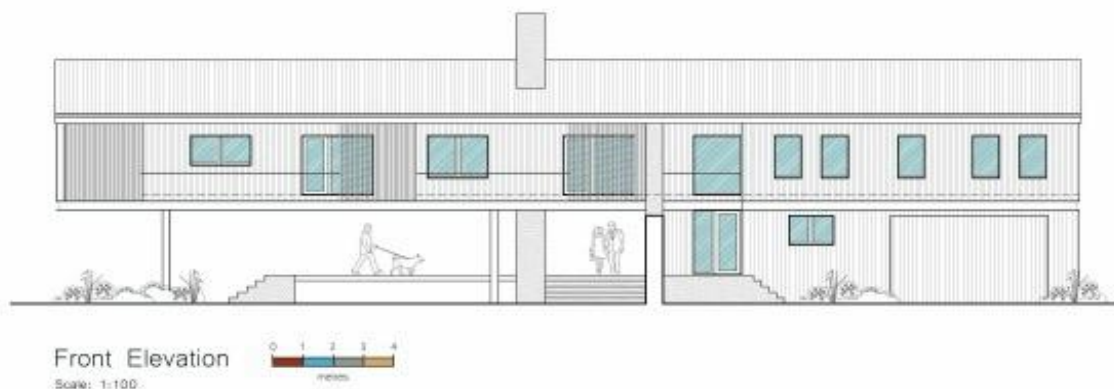
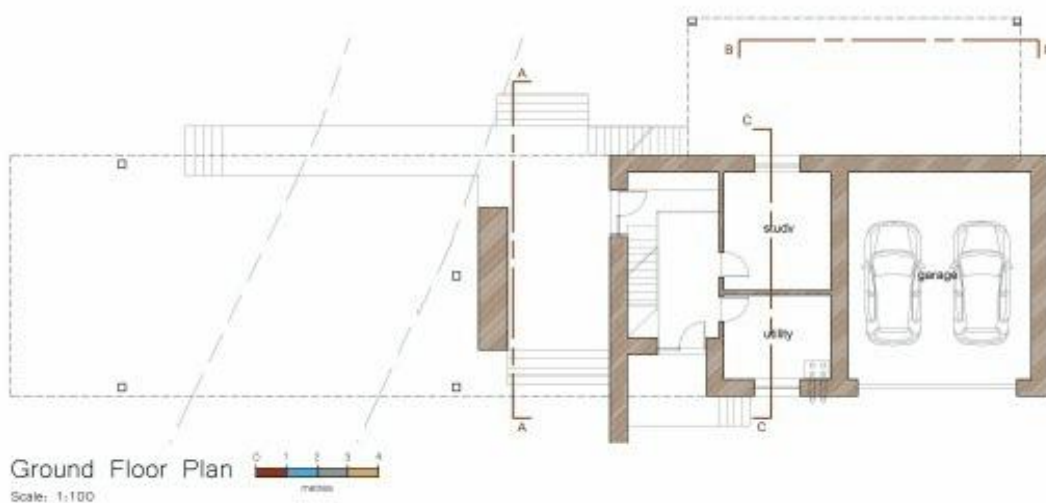
This narrative provides a response to the points raised by SHDC Environmental Health in an on line comment dated 27 May 2021 following a request to discharge the planning condition relating to contaminated land at the above site.

1.1 Proposed Development

The proposed residential development comprises a single dwelling, which, due to flood risk matters will have minimal ground floor accommodation i.e. predominantly first floor living with bedrooms and living areas **raised** to first floor level [anecdotally] understood to be by 'a least a metre'. The significance of this is that much of the footprint of the dwelling will not be in contact with the [potentially] ground gas bearing soils. Discussion with the Architect suggested that this **raised area will comprise approximately 75%** of the building footprint **leaving only [approximately] 25% in contact with the ground**, and this 25% will have minimal occupancy. The following [Third Party] images have been taken from the Design & Access Statement obtained from the SHDC Planning Portal to illustrate this aspect of the proposed development.



The following two images have been included to assist the Reader and illustrate more clearly the 'ground contact' area of the proposed building. It is understood that the ground contact area of the dwelling will accommodate a Utility Room and a Garage.



2. SHDC Env Health Comments

The content of the referred SHDC memo has been reproduced below in blue text for the purposes of clarity.

"I have reviewed the Goldfinch Environmental Report 'Proposed residential

development, Tilson Yard, Black Barn, Gedney Marsh, Spalding, Lincs. Geoenvironmental Desk Study' report reference 0548/1 and make the following comments: The historical mapping shows a pond which covers a significant part(approximately 50%) of the site. The pond is shown on each map edition from the 1880's until the 1970's. I therefore consider it be unlikely that this was an 'overspill area' - it would be extremely unlikely that a temporary overspill area was mapped with such frequency and at the same spatial extent. At the current time the report has not presented enough factual information relating to the pond and its potential for infill, and as such no conclusions can be draw with respect to the need, or not, for ground gas protection measures or the suitability for residential use. I therefore consider that some exploratory investigation is required at this location to reduce the uncertainty and establish the suitability for the proposed residential use. I note that the report was prepared for a previous site layout, this should be addressed in any further work undertaken.

I therefore recommend discharge of condition 7 part i only with parts ii-iv remaining outstanding, of H06-0772-19."

It was understood from Mr Parnell that SHDC also requested further factual information in the form of photographs of the trial pits that were excavated as part of the Phase 2 investigation reported during April 2020.

3. Detailed Risk Assessment – Ground Gas

3.1 Fieldwork

Regarding the further factual information requested by SHDC, this comprised any photographs of the trial pits that might be available as a result of the Phase 2 investigation. These were not originally included in the Phase 2 Report as past experience has shown these images can increase file sizes of documents such that there are difficulties in uploading the reports to planning portals.

In this instance the referred images have been provided in Appendix 1, which accompanies this letter report. For the convenience of the Reader, the trial pit location plan from the Phase 2 Report has also been included to allow easy reference of the trial pit locations within the Application area.

A review of the available information showed that images for six of the ten trial pits were available and these have been presented against their respective logs in Appendix 1. Of the six records three were located within the pond area and three were outside the pond area and all six were well distributed across the site in terms of the 'area of concern'. Trial pits TP1, TP2, TP3 and TP5 were not photographed based upon the consistency [similarity] of the soil type encountered at the time of the fieldwork. There was no evidence of anthropogenic inclusions in the arising soils in any of the trial pits to suggest these soils could be considered to be anything other than indigenous soils rather than 'Made Ground'.

3.2 Chemical Laboratory Test Results

A further review of the chemical laboratory test results in the context of the potential for ground gas generation carried out as part of the preparation of this narrative showed that the measured Organic Matter Content of the soils had an average value of just 1.6%, with minimum and maximum concentrations of 0.76% and 2.4% respectively.

Total Organic Carbon [TOC] content, a documented indicator for the *potential* for ground gas generation had an average measured value of approximately 0.98%, with minimum and maximum measured values of 0.44% and 1.4% respectively.

3.3 Ground Gas Risk Re-assessment

Reference has been made to CL:AIRE RB17 which suggests that a more robust assessment of the risk posed by the presence of ground gas may be achieved....allows the likely gas generation from a source [or potential source] to be estimated. It also considers that simple gas protection measures comprising underfloor venting and a gas-resistant membrane [as is proposed for the development at Tilsons Yard] have proven effective over a wide range of gas sources.

The paper also suggests that on many sites especially where ground gas protection measures will be provided it can allow gas well installation and [time consuming and expensive, given the size, scale and design of the proposed development] monitoring to be avoided especially where i.e. soils of low organic content are present with associated low ground gas generation potential [as the Author considers is the case at Tilsons Yard Black Barn site].

Consideration of Table 1 in this publication which provides 'Limiting Values of Organic Content' indicates that for *Made Ground* [taking a precautionary approach and assuming in the Application Site that the 'pond' area can be considered to be Made Ground for then purposes of the reassessment of ground gas risk], although fieldwork suggests otherwise a maximum TOC % of 3% [this value has been chosen from the measured laboratory data] and where 'Made Ground' has been in place for greater than 20yrs, a Characteristic Situation 2 [CS2] is suggested.

Previous experience with SHDC on another site, which was near to a closed landfill site showed that for 'precautionary ground gas protection measures' could be considered [in place of a further desk study]. When SHDC were consulted further regarding the phrase '*precautionary ground gas protection measures*' and its meaning, SHDC indicated that they would look for something that '*will easily satisfy BS8485:2015 CS2 or NHBC Amber 1*'.

It is reasonably anticipated that the proposed ground gas protection measures for the new dwelling which comprise a ventilated subfloor void supporting the 25% of the footprint which is in contact with the ground and a membrane [datasheet and installers

accreditation details provided at Appendix 2] which will be extended across the cavities and sealed into the DPC thus sealing out the internal spaces of this part of the building will achieve the precautionary position as suggested by SHDC on a site adjacent to a [closed] landfill and which this site is not, suggesting the application site is in a lower risk situation given the nature and consistency of the encountered ground conditions.

4. Concluding Remarks

it is considered by this Author that :~

1. Only approximately 25% of the building footprint will be 'ground bearing' thus in contact with soils at the site.
2. This part of the building will be as Utility Room and Garage and therefore the use of these areas may be considered 'minimal occupancy' compared to the bedrooms and living space the latter of which are raised off the ground by approximately 1metre [ventilated] as shown in the elevation above.
3. Soils across the site were shown to be consistent in nature and appearance [both within and outside the 'pond' area] and there was no evidence of anthropogenic inclusions.
4. Chemical laboratory testing has shown that both Organic Matter Content and TOC results were 'low' to 'very low'.
5. Mr & Mrs Parnell have proposed ground gas protection measures which will provide CS2 protection levels as required as a minimum [endorsed by this Author] by SHDC on other developments meaning that the approach to this Application [by Mr & Mrs Parnel] is consistent with precautionary best practice elsewhere across SHDC district.

We trust this correspondence now provides SHDC with sufficient information to agree that provided ground gas protection measures, as outlined above, are incorporated into the minimal footprint of the building, that the residual risk to human health from ground gas can be considered to be 'Negligible to Low' i.e. the development can be considered 'safe'.

On behalf of Mr & Mrs Parnell we thank you in advance for your prompt attention in this matter.

Yours faithfully

D Sargeant

D Sargeant

Goldfinch Environmental Ltd

FIGURES

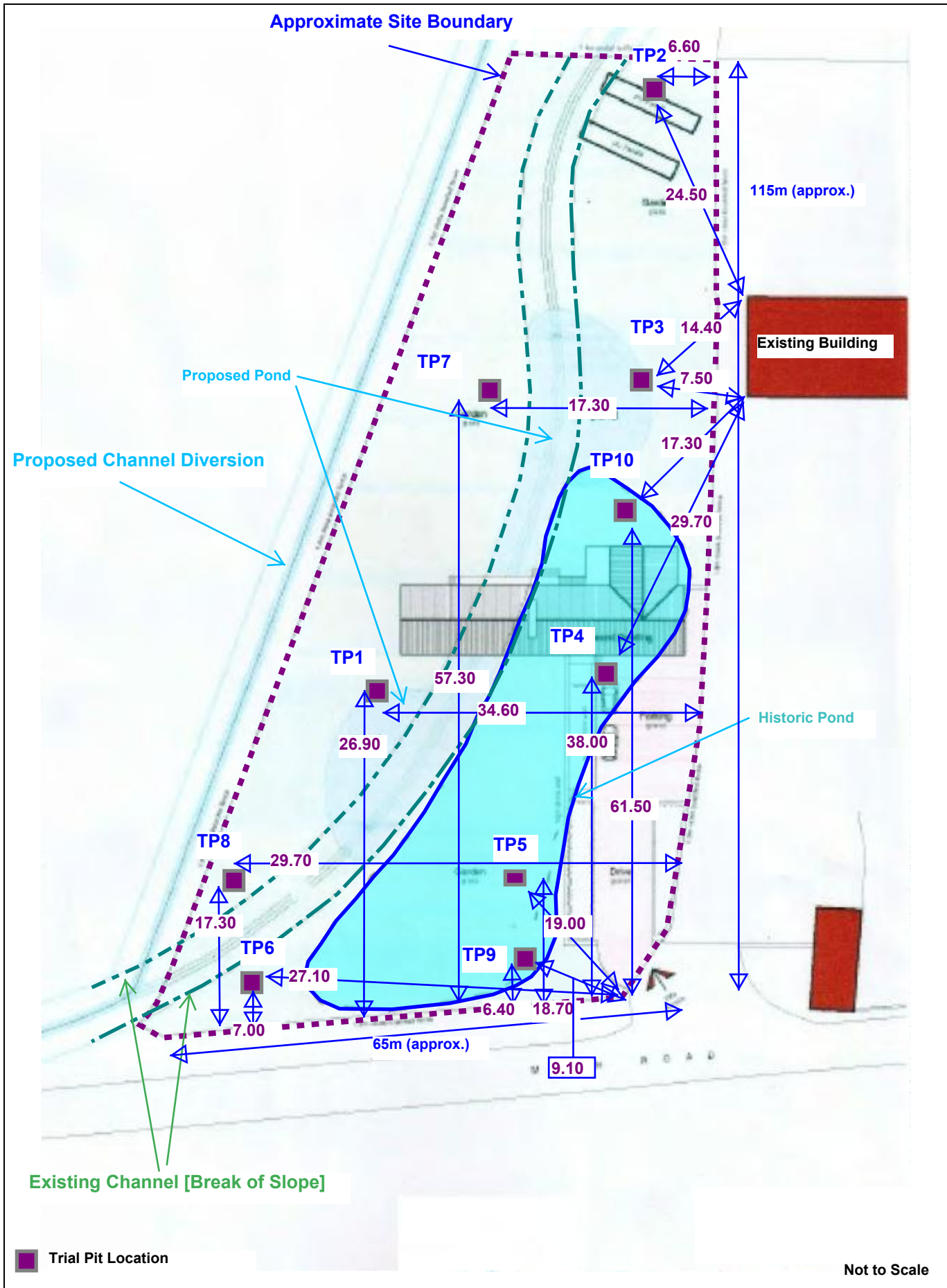


Figure 2

Ref: 0665/2

**Exploratory Location Plan
(Over Proposed Layout)**

Goldfinch
Environmental
Ltd

APPENDIX 1

Trial Pit Records & Photographs



Goldfinch
ENVIRONMENTAL LTD

EXPLORATORY LOCATION LOG

Site: Tilson's Yard, Black Barn

Location Ref: TP1

Date: 03/03/2020

Depth	Description	Sampling depth (m)	Remarks
0.00	Short grass over loose (friable?) dark brown slightly sandy slightly clayey silt	-	-
0.01	Loose dark brown slightly sandy slightly clayey Silt	D1 = 0.30-0.40	Horizon not fully penetrated

Notes:

1. Groundwater not encountered.
2. No apparent indicators of contamination [inc. Made Ground].
3. Location terminated at 750mm.



Goldfinch
ENVIRONMENTAL LTD

EXPLORATORY LOCATION LOG

Site: Tilson's Yard, Black Barn

Location Ref: TP2

Date: 03/03/2020

Depth	Description	Sampling depth (m)	Remarks
0.00	Short grass over loose (friable?) dark brown slightly sandy slightly clayey silt	-	-
0.01	Loose dark brown slightly sandy slightly clayey Silt	D1 = 0.50-0.60	Horizon not fully penetrated

Notes:

1. Groundwater not encountered.
2. No apparent indicators of contamination [inc. Made Ground].
3. Location terminated at 770mm.



Goldfinch
ENVIRONMENTAL LTD

EXPLORATORY LOCATION LOG

Site: Tilson's Yard, Black Barn

Location Ref: TP3

Date: 03/03/2020

Depth	Description	Sampling depth (m)	Remarks
0.00	Short grass over loose (friable?) dark brown slightly sandy slightly clayey silt	-	-
0.01	Loose dark brown slightly sandy slightly clayey Silt	D1 = 0.25-0.35	Horizon not fully penetrated

Notes:

1. Groundwater not encountered.
2. No apparent indicators of contamination [inc. Made Ground].
3. Location terminated at 550mm. (Obstruction – Plastic service / drainage pipe near building).



Goldfinch
ENVIRONMENTAL LTD

EXPLORATORY LOCATION LOG

Site: Tilson's Yard, Black Barn

Location Ref: TP4

Date: 03/03/2020

Depth	Description	Sampling depth (m)	Remarks
0.00	Short grass over loose (friable?) dark brown slightly sandy slightly clayey silt	-	-
0.01	Loose dark brown slightly sandy slightly clayey Silt	D1 = 0.35-0.45	Horizon not fully penetrated

Notes:

1. Groundwater not encountered.
2. No apparent indicators of contamination [inc. Made Ground].
3. Location terminated at 850mm.

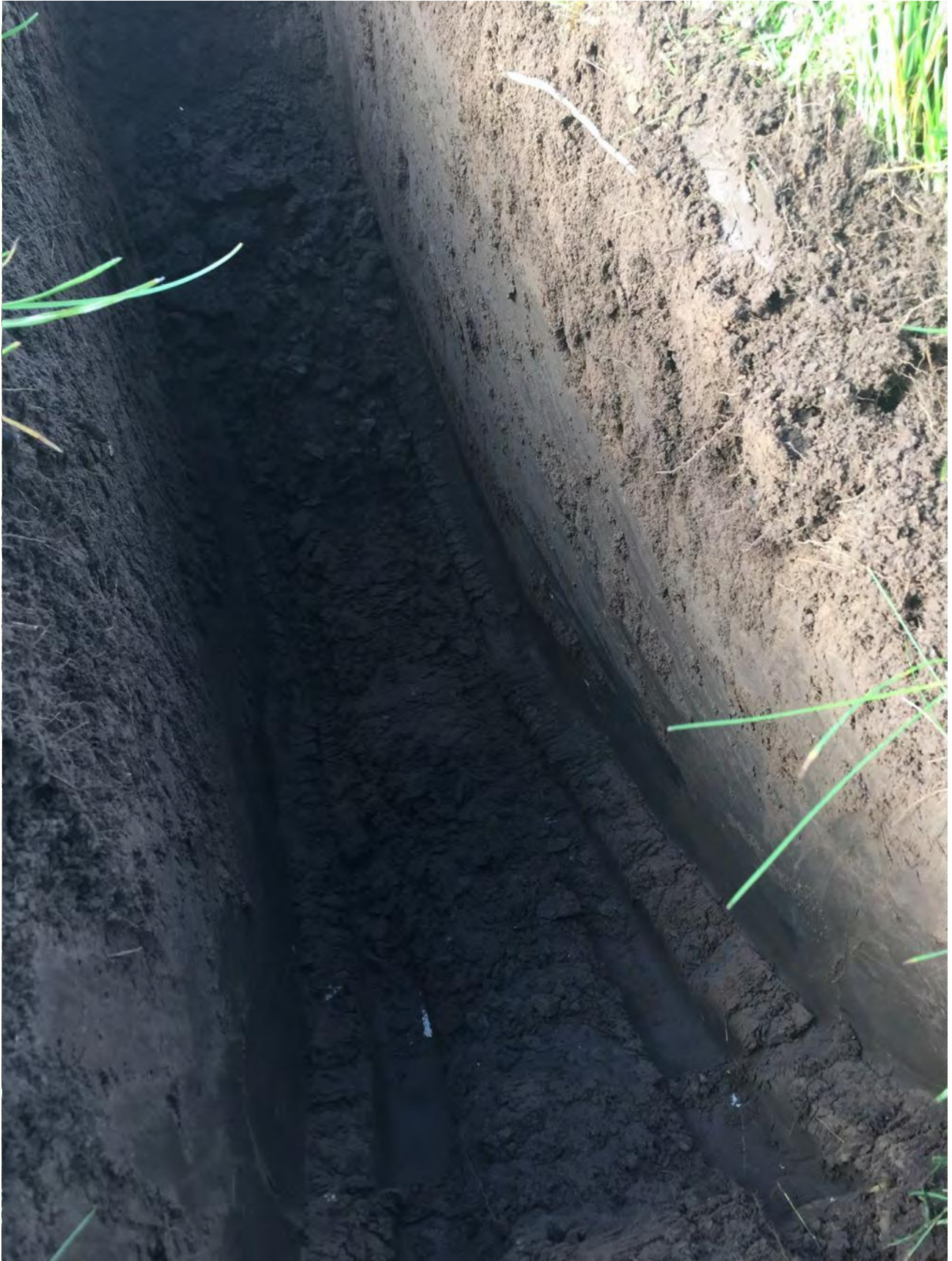


Plate 4i

Ref: 0665/L1

Trial Pit 4

Goldfinch
Environmental
Ltd



Plate 4ii

Ref: 0665/L1

Trial Pit 4

Goldfinch
Environmental
Ltd



Goldfinch
ENVIRONMENTAL LTD

EXPLORATORY LOCATION LOG

Site: Tilson's Yard, Black Barn

Location Ref: TP5

Date: 03/03/2020

Depth	Description	Sampling depth (m)	Remarks
0.00	Short grass over loose (friable?) dark brown slightly sandy slightly clayey silt	-	-
0.01	Loose dark brown slightly sandy slightly clayey Silt	D1 = 0.10-0.20	Horizon not fully penetrated

Notes:

1. Groundwater not encountered.
2. No apparent indicators of contamination [inc. Made Ground].
3. Location terminated at 760mm.



Goldfinch
ENVIRONMENTAL LTD

EXPLORATORY LOCATION LOG

Site: Tilson's Yard, Black Barn

Location Ref: TP6

Date: 03/03/2020

Depth	Description	Sampling depth (m)	Remarks
0.00	Short grass over loose (friable?) dark brown slightly sandy slightly clayey silt	-	-
0.01	Loose dark brown slightly sandy slightly clayey Silt	D1 = 0.20-0.30	Horizon not fully penetrated

Notes:

1. Groundwater not encountered.
2. No apparent indicators of contamination [inc. Made Ground].
3. Location terminated at 750mm.



Plate 6i

Ref: 0665/L1

Trial Pit 6

Goldfinch
Environmental
Ltd



Plate 6ii

Ref: 0665/L1

Trial Pit 6

Goldfinch
Environmental
Ltd



Goldfinch
ENVIRONMENTAL LTD

EXPLORATORY LOCATION LOG

Site: Tilson's Yard, Black Barn

Location Ref: TP7

Date: 03/03/2020

Depth	Description	Sampling depth (m)	Remarks
0.00	Short grass over loose (friable?) dark brown slightly sandy slightly clayey silt	-	-
0.01	Loose dark brown slightly sandy slightly clayey Silt	D1 = 0.30-0.40	Horizon not fully penetrated

Notes:

1. Groundwater not encountered.
2. No apparent indicators of contamination [inc. Made Ground].
3. Location terminated at 600mm.



Plate 7i

Trial Pit 7

Goldfinch
Environmental
Ltd

Ref: 0665/L1



Plate 7ii

Ref: 0665/L1

Trial Pit 7

Goldfinch
Environmental
Ltd



Goldfinch
ENVIRONMENTAL LTD

EXPLORATORY LOCATION LOG

Site: Tilson's Yard, Black Barn

Location Ref: TP8

Date: 03/03/2020

Depth	Description	Sampling depth (m)	Remarks
0.00	Short grass over loose (friable?) dark brown slightly sandy slightly clayey silt	-	-
0.01	Loose dark brown slightly sandy slightly clayey Silt	D1 = 0.40-0.50	Horizon not fully penetrated

Notes:

1. Groundwater not encountered.
2. No apparent indicators of contamination [inc. Made Ground].
3. Location terminated at 750mm.



Plate 8i

Ref: 0665/L1

Trial Pit 8

Goldfinch
Environmental
Ltd



Plate 8ii

Ref: 0665/L1

Trial Pit 8

Goldfinch
Environmental
Ltd



Goldfinch
ENVIRONMENTAL LTD

EXPLORATORY LOCATION LOG

Site: Tilson's Yard, Black Barn

Location Ref: TP9

Date: 03/03/2020

Depth	Description	Sampling depth (m)	Remarks
0.00	Short grass over loose (friable?) dark brown slightly sandy slightly clayey silt	-	-
0.01	Loose dark brown slightly sandy slightly clayey Silt	D1 = 0.15-0.25	Horizon not fully penetrated

Notes:

1. Groundwater not encountered.
2. No apparent indicators of contamination [inc. Made Ground].
3. Location terminated at 780mm.



Plate 9i

Trial Pit 9

Ref: 0665/L1

Goldfinch
Environmental
Limited



Plate 9ii

Ref: 0665/L1

Trial Pit 9

Goldfinch
Environmental
Ltd



Goldfinch
ENVIRONMENTAL LTD

EXPLORATORY LOCATION LOG

Site: Tilson's Yard, Black Barn

Location Ref: TP10

Date: 03/03/2020

Depth	Description	Sampling depth (m)	Remarks
0.00	Short grass over loose (friable?) dark brown slightly sandy slightly clayey silt	-	-
0.01	Loose dark brown slightly sandy slightly clayey Silt	D1 = 0.35-0.45	Horizon not fully penetrated

Notes:

1. Groundwater not encountered.
2. No apparent indicators of contamination [inc. Made Ground].
3. Location terminated at 900mm.



Plate 10i

Ref: 0665/L1

Trial Pit 10

Goldfinch
Environmental
Ltd



Plate 10ii

Ref: 0665/L1

Trial Pit 10

Goldfinch
Environmental
Ltd

APPENDIX 2

Datasheet Ground Gas Membrane Installer Accreditation

Juta GP® 1 - Gas Barrier is a multi-layer, low density polyethylene membrane, reinforced with a polypropylene reinforcing grid with an integral aluminium foil. GP® 1 is specifically designed and manufactured to perform as a Methane, Carbon Dioxide, Radon, Ground Gas, VOC /Hydrocarbon vapors, air & moisture protection system.

JUTA GP® 1			
Characteristics	Test Method	Unit	JUTA GP® 1
Physical Properties			
Thickness	EN 1849-2	mm	0.6
Thickness - Between Scrim	B5 EN ISO 9863-1:2016	Mm	0.4
Width	EN 1849-2	m	Various
Length	EN 1849-2	m	Various
Weight	EN 1849-2	G/M2	370
Hydraulic Properties			
Thickness	EN 20811	-	>300
Resistance to Water Penetration	EN 13967, EN 1928	-	Pass
Water Tightness	EN 1296, EN 1367, EN 1928	-	Pass
Hydraulic Properties			
Resistance to Static Load	EN 12730-B	Kg	20
Tensile Strength (MD)	EN 12311-1	N/50mm	600
Tensile Strength (CMD)	EN 12311-1	N/50mm	480
Tensile Elongation (MD)	EN 12310-1	%	20
Tensile Elongation (CMD)	EN 12310-1	%	20
Puncture Resistance	EN 12236	kN	1.25
Resistance to Tearing (Nail Shank) MD	EN 12310-1	N	330
Resistance to Tearing (Nail Shank) CMD	EN 12310-1	N	400
Durability and Chemical Resistance			
Transmission Rate of Volatile Liquids - Diesel	ISO 6179:2010 (B)	g/m2/h	0.246
Transmission Rate of Volatile Liquids - Xylene	ISO 6179:2010 (B)	g/m2/h	0.571
Transmission Rate of Volatile Liquids - Toluene	ISO 6179:2010 (B)	g/m2/h	0.583
Transmission Rate of Volatile Liquids - Petrol	ISO 6179:2010 (B)	g/m2/h	0.135
Gas Permeability			
Methane Permeability	BS EN ISO 15105-1	ml/m2/day/atm	<0.09
Carbon Dioxide Permeability	BS EN ISO 15105-1	ml/m2/day/atm	<0.09
Radon Permeability	K124/02/95	m2/s	8.0 x 10-15
Compliance and Certification			
CE Mark - EN13967:2012			
NHBC Standards Compliant			
BS 8485:2015 + A1 2019 Accordant			
BBA Certified - Certificate No. 12/4912			

Additional Information

HANDLING

® 1 should be stored on stable/level ground and stacked not more than five rolls high, with no other material stacked on top. The rolls can be stored outdoors when packaged, but should be protected from exposure to UV.

INSTALLATION

® 1 should be installed in accordance with the product installation guidelines, and in accordance with BS 8485:2015.

JOINTING AND SEALING

It is recommended that ® 1 be heat welded where possible, with welding carried out by competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS 8485:2015. ® 1 should be overlapped by at least 100mm. If taping joints, only suitable tape must be used, ensuring application with a silicone roller to remove trapped air. JUTA pre-formed details, or Self Adhesive Gas Membrane are available for sealing around protruberances.

ACCESSORY PRODUCTS



® 1 Starter Band



® Tape



® Self Adhesive Membrane



® Primer



® Top Hats and Preformed Corners



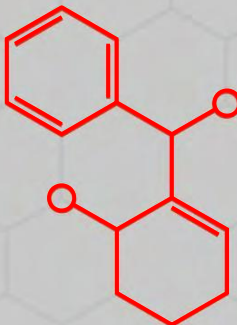
® Protection Fleece



® Void Vent (25/40mm)

PLEASE CONTACT JUTA UK DIRECTLY FOR MORE INFORMATION ON ® 1

Contact us to find out more information.
info@juta.co.uk | 01772 754177 | JUTA.CO.UK
Melton Grove Works, Church Road, Lytham, FY8 5PL



CERTIFICATE of ACCREDITATION

This is to certify that

Barrie Ackroyd

has been awarded the following accreditation

Gas Protection Verification Scheme (GPVS) ***Specialist (SGPV)***

Certificate No.: 435qQb4axS

Issued: 19 November 2020

Valid for 4 years from the above date



Richard Froggatt
CL:AIRE Chairman

