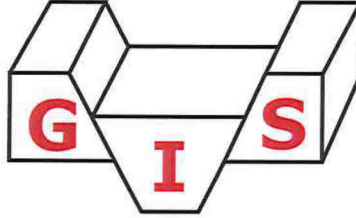

GROUND INVESTIGATION SPECIALISTS LIMITED

First Floor
Lowcroft House
Church Road
Wombourne
Wolverhampton
WV5 9EZ



Tel: 01902 717653

e-mail: mail@gisltd.uk

Web: www.groundinvestigationsspecialists.co.uk

Safe as House Care
16 – 20 Enterprise House
Springkerse Business Park
Stirling
FK7 7UF

Date: 6th March 2023

Our Ref: J 2444

Your Ref:

For the attention of Mr F Gouws

Dear Francois

**Re: Phase 2 Ground Investigation for Residential Development off Back Lane,
Skelmersdale, WN8 9BX**

We refer to our Phase 2 ground investigation report issued last month and now attach as referred to in section 5.3, the results of the three monitoring visits, carried out 20th and 25th February and 4th March 2023. For completeness we also include the results from the first three monitoring visits.

Table 1 (overleaf) is a summary of all the ground gas monitoring data.

Cont .../



Registered Office - Suite D, Astor House,
282 Lichfield Road, Sutton Coldfield, West Midlands B74 2UG

Registered in England No. 4076992

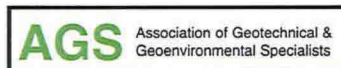


Table 1: Summary of Ground Gas Monitoring Data (6 visits)

<u>Borehole</u>	<u>Response Zone (mbgl)</u>	<u>No. of Monitoring Occasions</u>	<u>Methane (% v/v)</u>	<u>Carbon Dioxide (% v/v)</u>	<u>Oxygen (% v/v)</u>	<u>Steady Positive Flow (l/hr)</u>	<u>Water Level (mbgl)</u>	<u>Atmospheric Pressure Range (mBar)</u>
<u>WS1</u>	1.0 – 3.5	6	<0.1	2.2 – 2.5	10.5 – 18.0	0	1.28 – 1.87	1010 - 1029
<u>WS3</u>	1.0 – 4.5	6	<0.1	3.6 – 4.1	14.0 – 16.1	0	1.45 – 1.82	1009 - 1028
<u>WS5</u>	1.0 – 3.5	6	<0.1	2.4 – 3.1	14.2 – 17.9	0	2.18 – 3.08	1008 - 1027

No methane, hydrogen sulphide or steady positive gas flow was detected on the six monitoring occasions. Borehole WS5 recorded a trace of carbon monoxide (10 ppm) on 24th January 2023.

Low normal levels of carbon dioxide (2.2 – 4.1% v/v) were recorded throughout the monitoring period. Corresponding oxygen concentrations were slightly depleted on occasions.

Based on the GIS data, and referring to the guidance set out in BS 8485:2015, a Borehole Hazardous Gas Flow Rate (Q_{hg}) should be derived using the following equation:-

$$Q_{hg} = q \frac{(C_{hg})}{100} \text{ l/h}$$

Where q is the measured flow rate (in litres per hour);

And C_{hg} is the measured hazardous gas concentration (in percentage volume/volume).

Assuming a worst case steady positive of flow of 0.1 l/hr, the Q_{hg} 's for methane and carbon dioxide are calculated below:-

Methane:

$$Q_{hg}CH_4 = 0.1 \frac{(0.1)}{100} = 0.0001 \text{ l/h}$$

Carbon Dioxide:

$$Q_{hg}CO_2 = 0.1 \frac{(4.1)}{100} = 0.0041 \text{ l/h}$$

A typical gas screening value (GSV) of 0.004 l/hr can be assigned based on the Q_{hg} for carbon dioxide. This GSV would put the site in the lowest "Characteristic Gas Situation" (CS1) from the Modified Wilson & Card classification.

Table 4 of the guidance shows that on CS1 sites specialist gas protective measures will not be considered necessary in the new houses.

We recommend these findings along with the main Phase 2 ground investigation report be submitted to the Local Planning Authority for comment and approval, such that those conditions relating to contamination can be discharged.

Yours sincerely
for and behalf of
GROUND INVESTIGATION SPECIALISTS LIMITED



**H.S. Lister, BSc., CGeol., CSci., FGS.
Director.**

Encls.

GROUND INVESTIGATION SPECIALISTS LIMITED

CONTRACT: Back Lane, Skelmersdale	SHEET 1 OF 1 JOB No. 2444
CLIENT: Safe as Houses Investments	
ENGINEER: ADC Limited	

DATE: 24.01.23	AIR TEMP: 4 °C	ATMOSPHERIC PRESSURE: 1029 – 1027 mb	TECHNICIAN: HSL
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METEOROLOGICAL AND OUTSIDE SITE CONDITIONS

STATE OF GROUND	Dry	Moist	Wet	Saturated
WIND	Calm	Light	Moderate	Strong
CLOUD COVER	None	Scattered	Broken	Overcast
PRECIPITATION	None	Slight	Moderate	Heavy

BH ID	FLOW (l/hr)	START TIME	TIME ELAPSED (mins)	METHANE (% v/v)	CARBON DIOXIDE (% V/V)	OXYGEN (% v/v)	CARBON MONOXIDE (PPM)	HYDROGEN SULPHIDE (PPM)	WATER LEVEL (mbgl)
WS1	-10.40 rose to -3.3 after 3 mins	11:13	0.5	<0.1	1.2	19.3	0	0	1.28
			1	<0.1	2.1	18.5	0	0	
			2	<0.1	2.5	18.1	0	0	
			3	<0.1	2.5	18.0	0	0	
			4	<0.1	2.5	18.0	0	0	
			5						
WS3	-0.6 rose to -0.3 after 3 mins	11:41	0.5	<0.1	3.3	15.1	0	0	1.45
			1	<0.1	3.4	14.9	0	0	
			2	<0.1	3.5	14.8	0	0	
			3	<0.1	3.6	14.7	0	0	
			4	<0.1	3.6	14.0	0	0	
			5						
WS5	-12.6 rose to -3.4 after 3 mins	13:32	0.5	<0.1	1.8	17.6	10	0	2.18
			1	<0.1	2.2	16.8	10	0	
			2	<0.1	2.4	16.4	10	0	
			3	<0.1	2.3	16.3	10	0	
			4	<0.1	2.2	16.6	10	0	
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						

REMARKS:	FIG No.
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GROUND INVESTIGATION SPECIALISTS LIMITED

CONTRACT: Back Lane, Skelmersdale	SHEET 1 OF 1 JOB No. 2444
CLIENT: Safe as Houses Investments	
ENGINEER: ADC Limited	

DATE: 04.02.23	AIR TEMP: 8 °C	ATMOSPHERIC PRESSURE: 1025 mb	TECHNICIAN: HSL
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METEOROLOGICAL AND OUTSIDE SITE CONDITIONS

STATE OF GROUND	Dry	Moist	Wet	Saturated
WIND	Calm	Light	Moderate	Strong
CLOUD COVER	None	Scattered	Broken	Overcast
PRECIPITATION	None	Slight	Moderate	Heavy

BH ID	FLOW (l/hr)	START TIME	TIME ELAPSED (mins)	METHANE (% v/v)	CARBON DIOXIDE (% V/V)	OXYGEN (% v/v)	CARBON MONOXIDE (PPM)	HYDROGEN SULPHIDE (PPM)	WATER LEVEL (mbgl)
WS1	-8.2 rose to -3.8 after 20 secs	11:00	0.5	<0.1	1.7	16.9	0	0	1.28
			1	<0.1	2.2	15.6	0	0	
			2	<0.1	2.4	14.7	0	0	
			3	<0.1	2.4	14.6	0	0	
			4	<0.1	2.4	14.6	0	0	
			5						
WS3	-0.4 rose to -0 after 10 secs	11:14	0.5	<0.1	3.7	15.0	0	0	1.47
			1	<0.1	3.8	14.9	0	0	
			2	<0.1	3.8	14.8	0	0	
			3	<0.1	3.8	14.8	0	0	
			4						
			5						
WS5	-0.1	11:35	0.5	<0.1	3.0	14.4	0	0	2.78
			1	<0.1	3.0	14.2	0	0	
			2	<0.1	3.0	14.2	0	0	
			3	<0.1	3.0	14.2	0	0	
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						

REMARKS:	FIG No.
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GROUND INVESTIGATION SPECIALISTS LIMITED

CONTRACT: Back Lane, Skelmersdale	SHEET 1 OF 1 JOB No. 2444
CLIENT: Safe as Houses Investments	
ENGINEER: ADC Limited	

DATE: 13.02.23	AIR TEMP: 8 °C	ATMOSPHERIC PRESSURE: 1024 - 1022 mb	TECHNICIAN: HSL
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METEOROLOGICAL AND OUTSIDE SITE CONDITIONS

STATE OF GROUND	Dry	Moist	Wet	Saturated
WIND	Calm	Light	Moderate	Strong
CLOUD COVER	None	Scattered	Broken	Overcast
PRECIPITATION	None	Slight	Moderate	Heavy

BH ID	FLOW (l/hr)	START TIME	TIME ELAPSED (mins)	METHANE (% v/v)	CARBON DIOXIDE (% V/V)	OXYGEN (% v/v)	CARBON MONOXIDE (PPM)	HYDROGEN SULPHIDE (PPM)	WATER LEVEL (mbgl)
WS1	-0.2 rose to 0 after 20 secs	10:10	0.5	<0.1	2.3	11.0	0	0	1.53
			1	<0.1	2.3	10.7	0	0	
			2	<0.1	2.3	10.7	0	0	
			3	<0.1	2.3	10.7	0	0	
			4						
			5						
WS3	-0.1	10:19	0.5	<0.1	3.8	15.6	0	0	1.70
			1	<0.1	3.9	15.4	0	0	
			2	<0.1	3.9	15.4	0	0	
			3	<0.1	3.9	15.4	0	0	
			4						
			5						
WS5	0	10:37	0.5	<0.1	3.1	16.0	0	0	2.96
			1	<0.1	3.1	15.9	0	0	
			2	<0.1	3.1	15.9	0	0	
			3	<0.1	3.1	15.9	0	0	
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						

REMARKS:	FIG No.
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GROUND INVESTIGATION SPECIALISTS LIMITED

CONTRACT: Back Lane, Skelmersdale

SHEET 1 OF 1

CLIENT: Safe as Houses Investments

JOB No. 2444

ENGINEER: ADC Limited

DATE: 20.02.23

AIR TEMP: 11 °C

ATMOSPHERIC PRESSURE: 1010-1009 mb

TECHNICIAN: HSL

METEOROLOGICAL AND OUTSIDE SITE CONDITIONS

STATE OF GROUND	Dry	Moist	Wet	Saturated
WIND	Calm	Light	Moderate	Strong
CLOUD COVER	None	Scattered	Broken	Overcast
PRECIPITATION	None	Slight	Moderate	Heavy

BH ID	FLOW (l/hr)	START TIME	TIME ELAPSED (mins)	METHANE (% v/v)	CARBON DIOXIDE (% V/V)	OXYGEN (% v/v)	CARBON MONOXIDE (PPM)	HYDROGEN SULPHIDE (PPM)	WATER LEVEL (mbgl)
WS1	-0.1	10:28	0.5	<0.1	2.3	11.0	0	0	1.72
			1	<0.1	2.3	10.6	0	0	
			2	<0.1	2.3	10.5	0	0	
			3	<0.1	2.3	10.5	0	0	
			4						
			5						
WS3	0	10:36	0.5	<0.1	4.1	15.5	0	0	1.72
			1	<0.1	4.1	15.3	0	0	
			2	<0.1	4.1	15.3	0	0	
			3	<0.1	4.1	15.3	0	0	
			4						
			5						
W55	-0.2 rose to 0 after 10 secs	10:55	0.5	<0.1	2.9	17.5	0	0	3.05
			1	<0.1	2.9	17.5	0	0	
			2	<0.1	2.9	17.5	0	0	
			3	<0.1	2.9	17.5	0	0	
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						

REMARKS:

FIG No.

GROUND INVESTIGATION SPECIALISTS LIMITED

CONTRACT: Back Lane, Skelmersdale	SHEET 1 OF 1
CLIENT: Safe as Houses Investments	JOB No. 2444
ENGINEER: ADC Limited	

DATE: 25.02.23	AIR TEMP: 5 °C	ATMOSPHERIC PRESSURE: 1011-1008 mb	TECHNICIAN: HSL
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METEOROLOGICAL AND OUTSIDE SITE CONDITIONS

STATE OF GROUND	Dry	Moist	Wet	Saturated
WIND	Calm	Light	Moderate	Strong
CLOUD COVER	None	Scattered	Broken	Overcast
PRECIPITATION	None	Slight	Moderate	Heavy

BH ID	FLOW (l/hr)	START TIME	TIME ELAPSED (mins)	METHANE (% v/v)	CARBON DIOXIDE (% V/V)	OXYGEN (% v/v)	CARBON MONOXIDE (PPM)	HYDROGEN SULPHIDE (PPM)	WATER LEVEL (mbgl)
WS1	0	11:18	0.5	<0.1	2.2	11.9	0	0	1.87
			1	<0.1	2.2	11.8	0	0	
			2	<0.1	2.2	11.7	0	0	
			3	<0.1	2.2	11.7	0	0	
			4						
			5						
WS3	0	11:25	0.5	<0.1	4.0	15.8	0	0	1.82
			1	<0.1	4.0	15.8	0	0	
			2	<0.1	4.0	15.8	0	0	
			3	<0.1	4.0	15.8	0	0	
			4						
			5						
WSS	0	11:44	0.5	<0.1	2.7	18.0	0	0	3.08
			1	<0.1	2.8	17.9	0	0	
			2	<0.1	2.7	17.9	0	0	
			3	<0.1	2.7	17.9	0	0	
			4	<0.1	2.5	18.0	0	0	
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						

REMARKS:	FIG No.
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GROUND INVESTIGATION SPECIALISTS LIMITED

CONTRACT: Back Lane, Skelmersdale	SHEET 1 OF 1 JOB No. 2444
CLIENT: Safe as Houses Investments	
ENGINEER: ADC Limited	

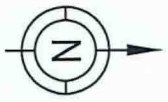
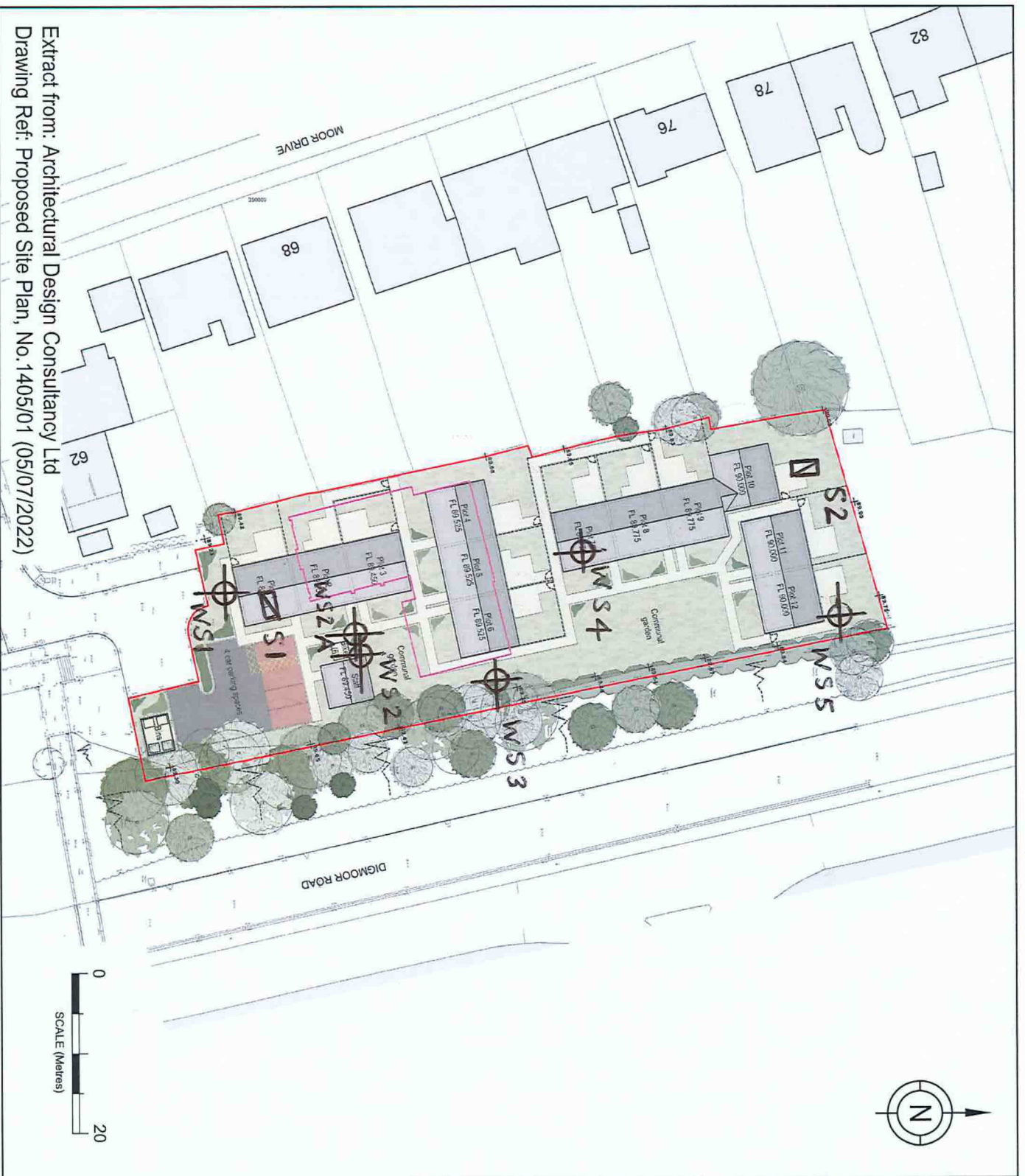
DATE: 04.03.23	AIR TEMP: 7 °C	ATMOSPHERIC PRESSURE: 1020 mb	TECHNICIAN: HSL
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METEOROLOGICAL AND OUTSIDE SITE CONDITIONS

STATE OF GROUND	Dry	Moist	Wet	Saturated
WIND	Calm	Light	Moderate	Strong
CLOUD COVER	None	Scattered	Broken	Overcast
PRECIPITATION	None	Slight	Moderate	Heavy

BH ID	FLOW (l/hr)	START TIME	TIME ELAPSED (mins)	METHANE (% v/v)	CARBON DIOXIDE (% V/V)	OXYGEN (% v/v)	CARBON MONOXIDE (PPM)	HYDROGEN SULPHIDE (PPM)	WATER LEVEL (mgl)
WS1	0	11:00	0.5	<0.1	2.2	12.5	0	0	2.01
			1	<0.1	2.3	12.3	0	0	
			2	<0.1	2.3	12.2	0	0	
			3	<0.1	2.3	12.2	0	0	
			4						
			5						
WS3	0	11:10	0.5	<0.1	4.0	16.2	0	0	1.81
			1	<0.1	4.0	16.1	0	0	
			2	<0.1	4.0	16.1	0	0	
			3	<0.1	4.0	16.1	0	0	
			4						
			5						
WSS	0	11:25	0.5	<0.1	2.6	17.9	0	0	3.12
			1	<0.1	2.7	17.9	0	0	
			2	<0.1	2.7	17.9	0	0	
			3	<0.1	2.7	17.9	0	0	
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						

REMARKS:	FIG No.
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KEY

— Site Boundary

Sampling locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.



Client:
Safe As Houses Investment PLC

Site:
Back Lane, Skelmersdale

Title:
Proposed Site Use

Job No.: LKC 20 1267	Scale (See Scale Bar): See Scale Bar	Figure: 3	Revision: A
Drawn By: AC	Checked By: PW	Drawn: Nov 2022	

Extract from: Architectural Design Consultancy Ltd
Drawing Ref: Proposed Site Plan, No. 1405/01 (05/07/2022)