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Our Ref: P11158/Let-01

Date: 30/03/2026

Mr Angus Jones
A F Jones Stonemasons
By Email Only

Dear Angus,

RE: 33 Bedford Road, Reading RG1 7EX – Gas Risk Assessment

Further to your instruction, GRM Development Solutions (GRM) has undertaken works pursuant to the discharge of condition 4 relating to planning permission PL/25/1003 for the above site:

Risk Assessment

a) The development hereby approved shall not be commenced until a site-specific land gas risk assessment in accordance with current guidance and a detailed land gas site investigation as necessary has been carried out by a competent person to fully and effectively characterise the nature and extent of land gas and its implications for the development hereby approved (and where necessary a Remediation Scheme b) and Implementation of Approved Remediation Scheme c)).

A copy of the GRM General Appraisal Comments and Standard Limitations is included in Appendix A.

Introduction / Background

The development comprises a change of use from Class E (offices) to C3 (dwelling houses) to provide two flats. No significant structural alterations are anticipated, other than the inclusion / reinstatement of former windows to the front and rear, and a door replaced by a window on the lowest elevation. A Site Location Plan is provided in Appendix B.

A Desk Based Geoenvironmental and Geotechnical Site Assessment has been prepared by TRC Companies Ltd (TRC), reference 633348.0000.0000 dated 25/04/2025, which has been used to inform the gas risk assessment.



The property is in a predominantly residential area and forms part of a row of terraced houses with similar building configurations, which are generally in residential use.

The report confirms there are no landfills within 250m of the property, the nearest being located 456m north west. The site history confirms that the site has been occupied by a terraced building (likely residential) since at least 1879, with the current building configuration present from the 1960s/1970s (either by demolition/construction or extensions). Until recently it has been in use as a stonemasons office and workshop (AF Jones Stonemasons, whose website indicates that they leased their Reading workshop since 1866). Some made ground is anticipated based on the potential for previous development, although this is not expected to be present to a depth greater than 1m (based on nearby BGS boreholes/likely depths of ground disturbance).

The site is not in an area which may be affected by coal mining.

The site does not lie within an area where radon protective measures are required for new buildings.

The TRC report concludes that *“based on the proposed development comprising conversion/refurbishment of the existing office buildings into a residential building, it is considered that no further works including an intrusive investigation is required”*.

GRM concur with this appraisal that the risk to users of the proposed development from ground gases is very low to negligible in the absence of any significant sources. Nevertheless, to provide further confidence in this assessment, a gas sweep survey was conducted to provide some in-situ monitoring evidence.

An email was sent to the Environmental Protection Team at Reading Borough Council on 03/03/2026 to agree the scope of works, but to date no response has been received.

High Resolution Sweep Survey

GRM commissioned Ground Gas Solutions Ltd (GGS), a ground gas specialist company, to undertake a high resolution gas sweep survey at the property.

The survey was undertaken on 10th March 2026 (during a period of falling atmospheric pressure) and the results are presented in Appendix C. The monitoring survey confirms that there is no risk to future site users from ground gases. An extract of the results is presented in the table overleaf.

Table 3.1 Maximum floor-level measurements and general comments (all ppmv)

Monitoring Location	Max. CH ₄	Max. CO ₂	Max. TVOC	Pertinent comments and observations
Ground floor	1.4	467	<0.1	Ambient CO ₂ measurement of 510ppmv.
Basement	1.8	489	<0.1	Ambient CO ₂ measurement of 525ppmv.
Outbuilding	1.5	459	<0.1	Old stonemason warehouse used to store tools, products and machinery including old paint containers and chemicals. Well-ventilated with incomplete windows and open skylight.

Note: Methane will typically vary between 1-3 ppmv in ambient air, carbon dioxide will typically range between 400-550 ppmv in ambient air.

Conclusions and recommendations

No further investigations are considered necessary for the proposed change of building use, and it is anticipated that condition 4 can be discharged in its entirety.

GGs recommends that service entry points into the building, such as ducts, conduits and pipe penetrations through the ground floor, basement and outbuilding are appropriately sealed using suitable gas-resistant materials as a precautionary measure. Independent verification is not considered to be required.

We trust this is suitable for your current requirements, should you require any further information or would like any clarification of the points raised please do not hesitate to contact us.

Yours sincerely,
for GRM Development Solutions Limited

Siobhan Jackson BSc (Hons) MEnvSc CEnv
Principal Geo-environmental Scientist

Richard Upton BSc (Hons), MSc, MEnvSc, CEnv
Director

Enc:

Appendix A - General Appraisal Comments and Standard Limitations

Appendix B – Site Location Plan

Appendix C - GGS DataPack, ref. GGS4291DP01 dated March 2026



Appendix A General Appraisal Comments & Standard Limitations

GENERAL APPRAISAL COMMENTS

i INFORMATION SOURCES

Where available the following sources have been used for the identification and assessment of potential ground hazards:

- Relevant British Standards
- British Geological Survey (BGS) Geology Map Scale 1:10,000 for local area
- British Geological Survey (BGS) Geology Map Scale 1:50,000/1:63,320
- BGS Memoir
- BGS Borehole Records: <https://mapapps2.bgs.ac.uk/geoindex/home.html>
- BGS online viewer: <https://geologyviewer.bgs.ac.uk>
- Magic Groundwater Vulnerability Maps
- Historical Ordnance Survey (OS) Maps
- Environmental Data Report
- Environment Agency Website: <http://www.environment-agency.gov.uk/>
- Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites, UKWIR, 2010.
- Coal Authority Records / Coal Mining Report
- DEFRA/Environment Agency Contaminated Land publications and DoE Industry Profiles
- BRE Guide BR211 (2023), 'Radon: Guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment projects)'
- UK HSA Radon Maps: <https://www.ukradon.org/information/ukmaps>
- CIRIA C665 'Assessing risks posed by hazardous ground gases to buildings'
- BS8485:2015 +A1: 2019, 'Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'
- Other technical references used throughout this document are detailed in the text.

ii CONTAMINANTS OF CONCERN

The DoE Industry Profiles are normally used to assess likely contaminants from past land use and potential nearby industrial sources. For land uses where no profile is available, likely contaminants of concern are selected by GRM based on past experience of similar sites, a general screening suite of contaminants covered by CLEA and common contaminants from the Industry Profiles.

- | | | |
|------------|-------------------|--|
| • Arsenic | • Copper | • Water soluble sulphate |
| • Cadmium | • Nickel | • PAH (polycyclic aromatic hydrocarbons) |
| • Chromium | • Zinc | |
| • Lead | • Phenols | |
| • Mercury | • cyanide (total) | |
| • Selenium | • pH | |

Asbestos and PCBs are listed in the vast majority of profiles. PCBs are listed as the profiles expect electricity substations and switch boxes on all industrial sites. There is the potential for asbestos containing material to be mixed up with made ground, following any demolition works.

iii CONCEPTUAL MODEL METHODOLOGY

The consideration of contamination is based upon the principles of risk assessment, using the 'source-pathway-receptor' model in order to establish the presence, or potential presence, of a pollutant linkage.

To create a risk, contamination must have the potential to cause harm to susceptible targets or receptors such as humans, the water environment or the built environment. The potential for harm to occur requires three conditions to be satisfied to form a pollutant linkage:

- The presence of substances that may cause harm (SOURCE).
- The presence of a target which may be harmed (RECEPTOR).
- The existence of a plausible migration route between the source and the receptor (PATHWAY).

In the absence of a plausible pollutant linkage there is no risk. Where a potential linkage is identified in order for it not to pose a risk to the identified receptor it must be broken.

iv INTRUSIVE INVESTIGATION SAMPLING METHODOLOGY

The ground investigation (including fieldwork, sampling, monitoring and laboratory analyses) has been designed to identify and assess potential ground related problems and to allow cost effective solutions to be advised. It has been planned on the basis of the desk study, site inspection and the proposed development layout (where available). All fieldwork and soil descriptions were carried out in general accordance with relevant British Standards.

The exploratory holes have been positioned and advanced to depths to determine the general ground/groundwater/gas conditions below the site. A general grid pattern has been adopted, where possible, to provide sufficient information based on the current proposed layout scheme. Some holes have been targeted at particular hazards identified in the Phase I assessment. The resultant exploratory hole density is considered to be commensurate with the complexity of the site conditions and detail of information required for this phase of the investigation.

v GROUND GAS RISK ASSESSMENT METHODOLOGY

Gas monitoring programmes undertaken by GRM are designed to broadly comply with the recommendations outlined in CIRIA Report C665 'Assessing risks posed by hazardous ground gas to buildings' (2007) and BS8576 'Guidance on Investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs) (2013).

To assess the risks posed by ground gases such as radon, carbon dioxide and methane, the relevant current guidance has been used. For radon the site has been assessed following the guidelines in 'Radon: guidance on protective measures for new dwellings (including supplementary advice for extensions, conversions and refurbishment projects) (BR211: 2023)'. For methane and carbon dioxide the primary guidance document used to determine if protection measures are required is *BS8485:2015 Code of practice for the design of protective measures from methane and carbon dioxide ground gases for new buildings*. This uses hazardous gas flow rates (Q_{hg}), which are gas concentrations multiplied by borehole flow rates, to derive a Gas Flow Rate (GSV) for the site. The gas regime is then determined based on the GSV and other limiting factors such as gas concentrations.

Where flow is not recorded during the monitoring a default flow rate of 0.1l/hr will be used in the assessment to produce a positive result.

vi HUMAN HEALTH RISK ASSESSMENT METHODOLOGY

Guidance contained in the Environment Agency's CLEA Reports has been used to assess the risks posed to human health.

For residential developments that include domestic gardens the default Tier 1 Assessment Criteria (TAC) for 'residential land with plant uptake' are used, i.e. a female with a start age class of one and an end age class of six. All pathways are considered including the consumption of home-grown vegetables.

For residential developments that do not include domestic gardens the default Tier 1 Assessment Criteria (TAC) for 'residential land without plant uptake' are used, i.e. a female with a start age class of one and an end age class of six. All pathways are considered except the consumption of home-grown vegetables. For commercial/industrial developments the default Tier 1 Assessment Criteria (TAC) for 'commercial/industrial' are used, i.e. a female with a start age class of sixteen and an end age class of eighteen. All pathways are considered except the consumption of home-grown vegetables.

The TAC used by GRM include Category 4 Screening Levels (C4SLs) published by DEFRA, values calculated by GRM using the CLEA v1.071 risk assessment, and values and Suitable for Use Levels (S4UL) developed by LQM/CIEH. The TAC used in the assessment are selected based on the lowest site specific SOM values returned as part of the chemical analysis.

Where soil chemical analysis results are found to exceed the TAC, Site-Specific Risk Assessments may be undertaken using the CLEA v1.071 risk assessment software using the age classes and pathways described above.

vii RISK TO SITE WORKERS – GENERAL COMMENTS

The risks to site workers are similar to those posed to site end users, although likely to be less severe due to the site workers' shorter exposure to the identified contamination. However, site workers (particularly groundworkers) are more likely to come into direct contact with contaminated soils due to the nature of their work. On this basis ground and construction workers should be provided with basic Personal Protective Equipment based on the site's general health and safety risk assessment, but including as a minimum safety footwear, gloves and overalls.

A site specific risk assessment should be carried out for all hazards identified within the ground investigation in accordance with current health and safety legislation. This assessment should identify any measures required to further reduce risks i.e. providing further Personal Protective Equipment, welfare facilities and if necessary preventing access to certain areas.

Demolition and dismantling of existing structures on the site must be carried out to a safe and acceptable standard, in accordance with current UK guidance and best practice. Whilst not ground related, asbestos and hazardous substances surveys should be conducted prior to any demolition.

Any unusual colours, odours and suspicious ground should be reported immediately to site management and then GRM.

Whilst this appraisal has considered the long-term effects of contamination, GRM can also help during the formulation of Health and Safety documentation, if required.

viii CONTROLLED WATERS RISK ASSESSMENT METHODOLOGY

Where the desk study and fieldwork do not reveal a potential source of contamination no leachate or groundwater testing will be performed. Where a potential source is identified the testing will comprise leachate testing on the material considered most likely to pose a risk, groundwater testing will be undertaken if water is present at shallow depth.

The UK Drinking Water Standards (UKDWS) or Environmental Quality Standards (EQS) are usually adopted for comparison with the leachate/groundwater test results. When the most sensitive receptor is considered to be the aquifer (groundwater) UKDWS will be adopted as the Initial Tier 1 screening values.

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Where the most sensitive receptor is a surface water feature the EQS values will be used as Initial Tier I Screening values.

ix CONSTRUCTION MATERIALS RISK ASSESSMENT METHODOLOGY

The 'screening levels' adopted for the assessment of risk to construction materials are taken from the following documents:

- UK Water Industry Research (UKWIR) Contamination thresholds for sub-surface water pipes, for the protection of buried pipes.
- Building Research Establishment (BRE) Special Digest SD1 (2005), 'Concrete in Aggressive Ground', for the protection of buried concrete.

x WASTE DISPOSAL, SITE WASTE MANAGEMENT PLANS AND MATERIAL MANAGEMENT PLANS

Under current Waste Management Regulations, waste soil materials produced from the site will require characterisation to enable it to be disposed of correctly.

The chemical analysis results included in this report should be provided to the relevant landfill operators to establish the characterisation of the waste, confirm its suitability for landfill disposal and provide estimated costings. If material is classified as hazardous, then the site will need to be registered with the Environment Agency prior to the movement of the waste. Depending on the receiving landfill's current permit, further chemical analysis, incorporating Waste Acceptance Criteria (WAC) leachate analysis, may be required.

All materials removed from the site will be classified as 'waste' and therefore must be removed by a suitably licensed carrier of waste. This applies whether or not the waste is contaminated. All waste removed to landfill will attract Landfill Tax.

The developer/builder is likely to be classed as the waste producer and therefore, has a duty of care to ensure that all waste is disposed of appropriately. This includes ensuring the waste carrier is licensed and disposes of the waste to a suitably licensed landfill site. They are also required to keep a paper trail from 'cradle to grave' including copies of the waste disposal tickets.

Efficient materials management on site is recommended as it can lead to significant cost savings when compared to the traditional side casting or single stockpile of arisings. GRM can assist in the production of Material Management Plans under the CL:AIRE Definition of Waste: Code of Practice. The DoWCoP enables:

- The direct transfer and re-use of clean naturally occurring soil materials between sites, and
- The re-use of both contaminated and uncontaminated materials on their site of origin and between sites within defined Cluster projects.

GRM can also undertake the role of Qualified Person and submit the DoW CoP project Declaration.

Likewise making the site as volume neutral as possible will reduce the costs of development. Whilst not a statutory requirement, Site Waste Management Plans allow better waste management practices, help to reduce the amount of waste produced and identify best environmental disposal options. Implementing a Site Waste Management Plan (SWMP) can reduce costs (increasing business profits) and maximise resource efficiency.

xi GEOTECHNICAL ASSESSMENT GENERAL COMMENTS

Where finished floor levels of proposed structures have not been provided by the Client, then for the purposes of initial assessment, GRM will assume that finished levels will not vary appreciably from the existing ground levels. If the depths of any underground engineering works (i.e. sewers, pumping stations etc.) are unknown they will not be taken in to account in the assessment and it will be assumed that any such works will not compromise foundation or ground stability.

Should the development proposals or finished levels be different from these assumptions then the comments/recommendations in the Geotechnical Assessment may require revising.

It should be noted that the results of window sampling and/or cable percussive boreholes may not give a true indication of a soils actual engineering properties (i.e. stability, mass structure etc). GRM consider that that prior to development trial pitting should be undertaken to confirm the recommendations in the Geotechnical Assessment.

xii GEOTECHNICAL ASSESSMENT – ENGINEERING GROUND TREATMENT

Near surface soils have the potential to be disturbed by weathering and site traffic. Precautions should always be taken to avoid this, as excessive disturbance may leads to more onerous floor slab designs, road cap thickness and increased amounts of off-site disposal etc.

Near surface soils may need treatment or reinforcing to allow safe movement of construction plant and labour. An assessment by the contractor should be undertaken once the type of machinery/plant needed to complete the development is known.

xiii GEOTECHNICAL ASSESSMENT – EXCAVATIONS

Excavation instability (over-break) can result in damage to existing services or structures (e.g. foundations, roads or boundary walls/fences) both on and off-site, as well as increased foundation concrete costs. In order to minimise this, all excavations deeper than 1.2m deep (or any excavation within 1.5m of any existing structure or service) should be supported. Full support should be provided to the full depth of all near vertically sided excavations in made ground, soft and very soft clays and granular soils. A reduction to intermediate support should be acceptable within firm and stiffer natural clays.

Wherever possible, man entry into excavations should be prevented; however, where this is not possible, entry to, and time spent in, excavations should be kept to a minimum.

The build program should be tailored to reflect the impact that deep excavations through potentially unstable strata can have on adjacent properties, so that they are not undermined.

All excavations on site should be in accordance with HSE guidelines and stability should be practically maintained at all times. Reference should be made to HSE construction information sheet No. 8 (Revision 1) 'Safety in Excavations'.

Care should be taken to ensure that falls from excavation faces do not adversely affect the integrity of foundation concrete.

If contaminated water enters excavations it should be removed and transported to an appropriate treatment facility by a suitably licensed carrier before construction begins.

xiv GEOTECHNICAL ASSESSMENT – SUBSTRUCTURES

Where practicable, existing buried construction should be fully removed; however, if this is not practicable all new foundations should be carried down to fully penetrate it and it should be broken well away from all new structures.

There may be existing structures and/or infrastructure in close proximity to the proposed development. New build foundations may be constructed next to pavements with existing underground services beneath them, or excavations may be required near existing footings associated with adjacent properties. These potential hazards need to be taken into consideration when designing foundations and the groundworker needs to be made aware of their potential impact during the redevelopment works. Foundations close to existing underground services or buildings may require alternative foundation techniques (such as piling) to protect the integrity of these structures.

The contractor for the works should carry them out in such a fashion so as to not cause excessive overbreak, concrete usage or undermine existing buildings/roads/ services that are to be retained.

xv **GEOTECHNICAL ASSESSMENT – SOAKAWAYS**

Soakaway testing in trial pits by GRM is broadly carried out in accordance with BRE DG 365 (2016). The testing comprises the excavation of a test pit to a suitable depth, and the placement of water into the pit. The level of water present is then monitored over time. For borehole installations, the permeability testing (falling head/rising head) is undertaken in accordance with BS5930.

If it is decided to proceed with the use of soakaway drainage, then the following general points should be noted:

- Soakaways should not be placed so that water can be discharged through potentially contaminated made ground.
- The Environment Agency may require soakaways to be sealed systems such that only roof run off falls to soakaway.
- Interceptors are likely to be required for soakaways for highway drainage. The adopting authority for the highways should be consulted at the earliest opportunity regarding the use of soakaways for highways drainage.
- Consideration of site levels and slopes should be taken into account during the design.
- The construction of all soakaways should be in accordance with the current building regulations.
- Soakaways should not be placed within 5m of a proposed building.
- Placement of soakaways needs to be considered so as to avoid ponding of water down slope.
- The base of a soakaway should not be below the highest recorded water level.
- The Environment Agency prefer 1m of dry soil to be present between the base of a soakaway and the water table to provide attenuation for contamination.

xvi **GEOTECHNICAL ASSESSMENT – FOUNDATIONS**

If soft or hard spots are encountered during foundation excavation then they should be replaced with suitably compacted material or the footings deepened to suitable strata, to avoid differential settlement.

If strata of differing bearing character (e.g. sand and clay) are encountered at foundation levels within the excavations for a single plot then the excavation depths should be altered as appropriate to ensure the foundations rest on a single stratum, or strata that will not induce differential settlement. Where this is impractical then GRM should be contacted to assess a reinforced concrete detail or an alternative foundation solution (e.g. piles or vibro-replacement).

NOTES ON LIMITATIONS

General

GRM Development Solutions Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement had been executed, or with whom an assignment had been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from GRM Development Solutions Limited; a charge may be levied against such approval.

GRM Development Solutions Limited accepts no responsibility or liability for:

- a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and
- b) the consequences of this document being used by any third party with whom an agreement has not been executed.

Phase I Environmental Audits/ Desk Studies

The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, GRM Development Solutions Limited reserves the right to review such information and as considered necessary and appropriate to modify the opinions accordingly. It should be noted that any risks identified in a Phase 1 report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Environmental Audits (Contamination Investigations)

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated with potential human targets, building materials, and controlled waters.

The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to the areas unoccupied by the building(s) on the site and by buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues need to be resolved.

For these reasons if costs have been included in relation to site remediation these must be considered as provisional only and must, in any event, be confirmed by a commercial adviser.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. Whilst exploratory testing is intended to gain an accurate representation of the site, the very nature of sampling and testing is such that it cannot ensure that all localised conditions are detected.

The risk assessment and opinions provided take in to consideration, inter alia, currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

Phase II Geo-environmental Investigations (Combined Geotechnical and Contamination Investigations)

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions to provide a reasonable assessment of the environment risks together with engineering and development implications. If costs have been included in relation to site development a commercial adviser must confirm these.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site for each of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

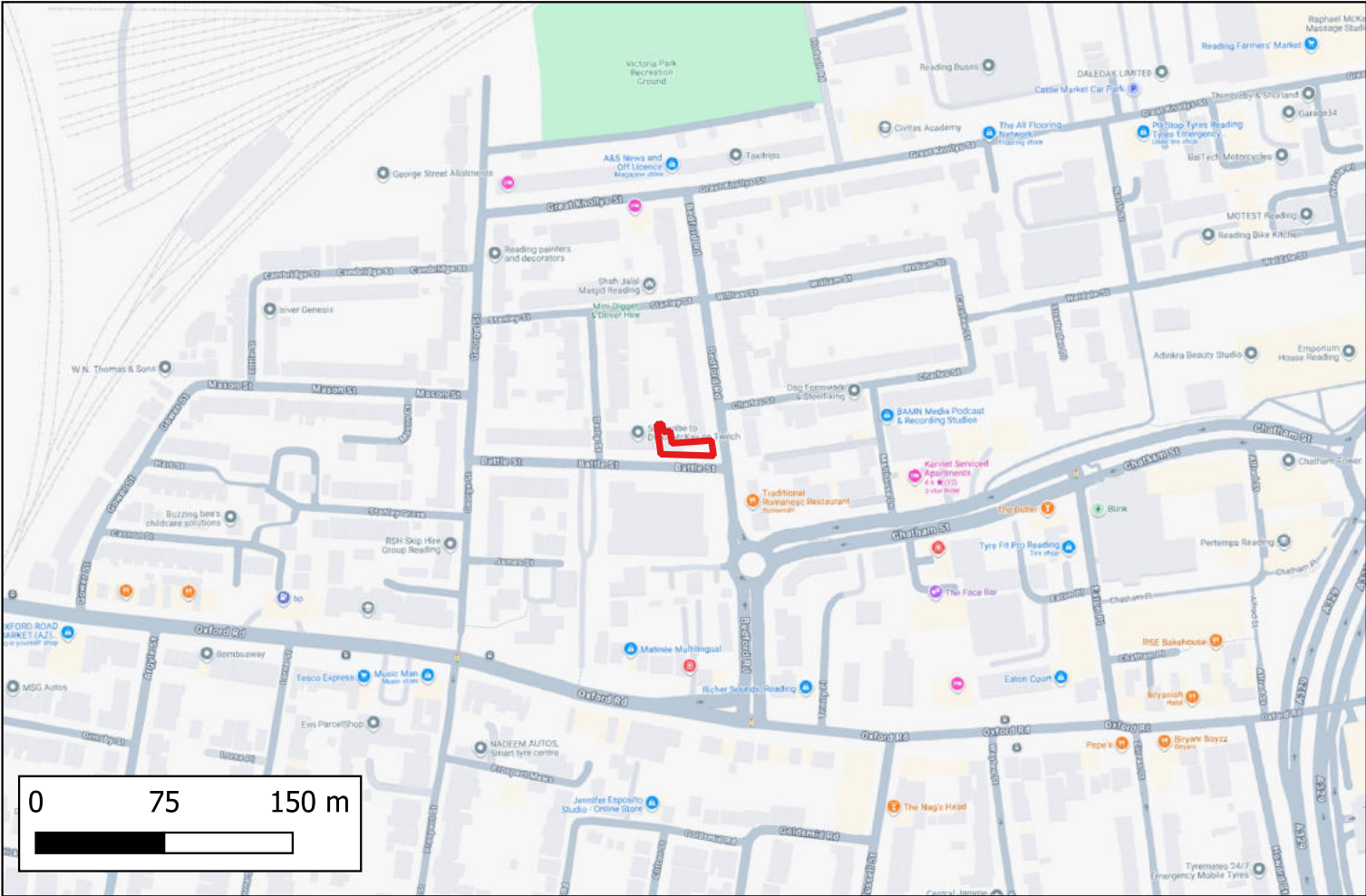
The comments made on groundwater conditions are based on observations made at the time the site work was conducted. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects. The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.



The risk assessment and opinions provided take in to consideration, inter alia, currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.



Appendix B Site Location Plan



NOTES:

NOTES



Site Location

CLIENT:

AF JONES STONEMASONS

PROJECT:

33 BEDFORD ROAD, READING

TITLE:

SITE LOCATION PLAN

PROJECT No:

P11158

DATE:

26/03/2026

DESIGN/DRAWN:

BW

DRAWING NUMBER:

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ISSUE:

FINAL

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Appendix C GGS DataPack, ref. GGS4291DP01 dated March 2026



GGs DataPack®

Understanding the hazards and risks at your site

GGs4291 33 Bedford Road, Reading

Ref: GGS4291DP01

Issue: Final

Date March 2026



Certificate No.222522015



Certificate No.222532015



Certificate No.222542015

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FOREWORD

This report has been prepared based on information made available to Ground-Gas Solutions, trading as GGS, at the time of the reporting using all reasonable skill, care and diligence and within the limitations of the scope of works agreed with, and resources provided by, the client.

GGs has relied on information provided by others and has prepared this report on the basis of this information being accurate.

The report and recommendations therein are provided based on information available to GGS at the time of preparing the report and completed to recognised UK guidance and legislation. GGS will not accept any liability for inaccurate or incomplete information provided to GGS or any liability arising from the future change of any such guidance or legislation.

GGs is not obliged and disclaims any obligation to carry out further works or update the report for events occurring after such works have been carried out, and / or report issued in final form. This also applies to transfer of the report to other parties.

This report must be issued as final and be signed by the author and approved by a company director or senior management before the report may be relied upon by the client and subject to full payment for our services being made.

Any third parties using or relying on the information, comments, conclusions and recommendations do so at their own risk. Should any third party wish to use or rely upon the content of the report, written approval must be sought from a GGS Director; a charge may be levied against such approval.

The copyright and other intellectual property rights in all material in this report (including without limitation photographs, data and graphical images) are owned by GGS.

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Appendix A

Site Location Plan

Appendix B

Site Photographs

Appendix C

Gas Sweep Survey Records

Appendix D

Calibration Certificates & Instrument Specifications

GGGS DataPack® 33 Bedford Road, Reading

1 Introduction

GGGS Limited has been commissioned by GRM Development Solutions to provide ground gas monitoring and consultancy services, at 33 Bedford Road, Reading ('the site'), and prepare a GGS DataPack® report containing the following information:

- Gas sweep survey records
- Atmospheric pressure analysis
- Conclusion and recommendations
- Instrument specifications and calibration certificates.

The objective of the monitoring assessment is to provide robust monitoring evidence to accurately update the gas Conceptual Site Model (gCSM).

1.1 Scope of works

The scope of works is set out below:

- A site visit by GGS specialists on 10th March 2026 to undertake a high-resolution gas sweep survey.
- Provision of a GGS DataPack® report.

GGs DataPack®

33 Bedford Road, Reading

1.2 Site context

Table 1.1 below details the site description. Site and monitoring location plans are presented in Appendix A.

Table 1.1 Site description

Description	Details
Address	33 Bedford Road Reading RG1 7EX
National Grid Reference (Approximate centre of site)	SU 70695 73549
Overview & Objectives	The site is currently under consideration for refurbishment from commercial use to residential use. The Phase I investigation identified a potential risk of ground gas from the underlying Made Ground, particularly in the context of the proposed residential end use and presence of below-ground structures. As such, the preliminary conceptual site model developed from previous reporting identified a potential contaminant linkage whereby ground gases and vapours could migrate into the building and accumulate within enclosed spaces. However, there have been no known recorded ground gas issues at the site and/or immediate area, and the proposed refurbishment works will not alter the existing floor slab design or introduce new below-ground voids or pathways. The Made Ground is anticipated to be of limited thickness and associated with historical development of the site and surrounding area, rather than extensive infilling and/or putrescible or deleterious waste. On this basis, the local ground gas regime is expected to represent a very low generational source. The regulator has requested additional assessment to confirm whether there a viable ground gas contaminant linkage is present and determine whether gas protection measures require further consideration within detailed design. A high-resolution 'gas sweep' survey has been proposed across the full building footprint. This approach is intended to identify any preferential pathways or ingress points for ground gas/VOC vapours and to confirm whether ground gas migration or vapour intrusion into the structure is occurring under existing conditions.

2 Methodology

2.1 High-resolution gas sweep survey

GGs completed high-resolution gas sweep surveys of the site on 10th March 2026. A TDL500 was used to detect methane, a GFM226 was used to detect carbon dioxide, and a Photo-ionisation Detector (PID) was used to measure Total Volatile Organic Compounds (TVOCs). All measurements were recorded to parts per million by volume (ppmv) level.

During the gas sweep survey, GGS targeted areas of likely potential ground gas ingress (such as service entry points), along with areas of likely ground gas accumulation (such as basements, enclosed rooms or cupboard spaces). Concentrations within these discrete locations, and within ambient areas, were recorded on a proforma record sheet.

Figure 1 below presents selected GGS site photographs taken during the gas sweep survey. Additional site photographs are provided in Appendix B.



Figure 1 Selected GGS site photographs taken during the detailed gas sweep survey, including survey measurements targeting service entry points on the ground floor.

A summary of the gas sweep survey results is presented in Section 3.1, whilst the full gas sweep survey records are presented in Appendix C.

3 Results

3.1 High-resolution gas sweep survey summary

A high-resolution gas sweep survey was undertaken by GGS specialists on 10th March 2026.

A summary of measurements and observations recorded during each survey is presented in Table 3.1 below, whilst the full gas sweep survey records are presented in Appendix C.

Table 3.1 Maximum floor-level measurements and general comments (all ppmv)

Monitoring Location	Max. CH ₄	Max. CO ₂	Max. TVOC	Pertinent comments and observations
Ground floor	1.4	467	<0.1	Ambient CO ₂ measurement of 510ppmv.
Basement	1.8	489	<0.1	Ambient CO ₂ measurement of 525ppmv.
Outbuilding	1.5	459	<0.1	Old stonemason warehouse used to store tools, products and machinery including old paint containers and chemicals. Well-ventilated with incomplete windows and open skylight.

Note: Methane will typically vary between 1-3 ppmv in ambient air, carbon dioxide will typically range between 400-550 ppmv in ambient air.

4 Atmospheric Pressure Analysis

The relationship between atmospheric pressure and ground gas can form a critical part of the source-pathway-receptor contaminant linkage model, which is noted in numerous guidance documents. Specifically, it is falling atmospheric pressure, and the rate in which it is falling along with the duration of the fall, that are two of most important factors to consider. A third important factor is low atmospheric pressure.

GGs has undertaken a site-specific analysis for atmospheric pressure during the gas sweep survey undertaken in March 2026.

For weather forecasting in the UK, The Meteorological Office¹ records falling pressure tendency over a 3-hour period, whereby every hour the change in atmospheric pressure over the proceeding 3 hours is noted as being:

- Stable <0.1 millibars
- Falling (or rising) slowly >0.1 millibars
- Falling (or rising) >1.6 millibars
- Falling (or rising) rapidly >3.6 millibars
- Falling (or rising) very rapidly >6 millibars

This provides a clear numerical assessment of the pressure trend at the point of measurement. Standard mean sea level pressure (MSLP) in the UK is defined as 1013.25 millibars², which provides a common value to compare atmospheric pressure across different locations and elevations. With consideration to the site's geographical location, the annual average atmospheric pressure would be approximately 1015.2 millibars.

Using GGS' atmospheric pressure threshold calculator tool and based on the site's geographical location, atmospheric pressure can also be segmented into five distinct categories as follows³:

¹ https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/library-and-archive/library/publications/factsheets/factsheet_8-shipping-forecast.pdf

² <https://www.metoffice.gov.uk/weather/learn-about/weather/how-weather-works/high-and-low-pressure>

³ GGSWP03 Atmospheric Pressure and a Simplified Approach to Determine Worst-Case Conditions for Ground Gas Monitoring in the UK, 2025, GGS Limited, <https://ggs-uk.com>

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- Very high >1032.0 millibars
- High >1022.4 <1032.0 millibars
- Normal >1008.8 <1022.4 millibars
- Low >995.7 <1008.8 millibars
- Very low <995.7 millibars

For the purpose of atmospheric pressure analysis, GGS has obtained historical weather data which is based on reanalysis datasets. A combination of weather station, aircraft, buoy, radar and satellite observations are used to create a comprehensive record of past weather conditions. All the assessed atmospheric pressure data is relative to sea level pressure.

To provide additional context to the survey in terms of the atmospheric pressure regime (likely to be the dominant ground gas driver), the trend either side of the monitoring visit is presented in Figure 3 below. All atmospheric pressure data is taken from Open Meteo⁴.

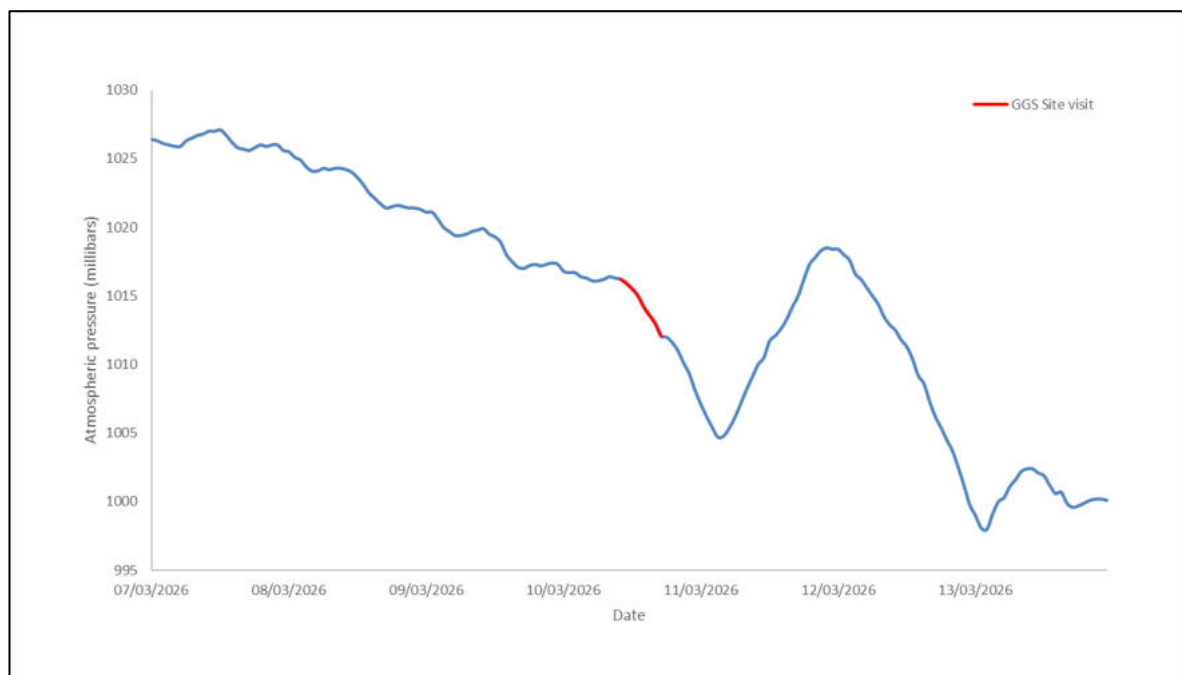


Figure 3 Atmospheric pressure trend 7th March to 13th March 2026, With the gas sweep survey on 10th March 2026 highlighted in red.

In summary, a variable atmospheric pressure regime was captured before, during and after the site visit, with a falling pressure trend evident during the gas sweep survey. Falling

⁴ <https://open-meteo.com/en/docs/historical-weather-api>

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atmospheric pressure is considered to most likely be the dominant driver for which ground gas ingress to occur.

Slow normal falling atmospheric pressure was evident during the site survey from 1016.1 to 1014.9, which was at and around the geographical annual average of 1015.2 millibars. The maximum pressure tendency recorded during the survey was a fall of 1.7 millibars over the preceding 3-hours. There was a general falling atmospheric pressure trend over the preceding 3 days prior to the survey, falling from 1027.1 millibars on 7th March at 12:00 to 1014.9 millibars on 10th March at 13:00. However, this was a high to normal slow falling trend and not continuous i.e., the general trend included periods of stable pressure.

Additional monitoring data under more variable pressure conditions, such as low rapid falling atmospheric pressure, would provide an increased confidence level to a plausible gas contaminant linkage.

5 Conclusion and Recommendations

In summary, no ground gas contaminant linkages associated with methane, carbon dioxide, or total volatile organic compounds (TVOCs) were identified during the gas sweep survey, which was completed during a falling atmospheric pressure regime. The concentrations measured throughout the building were consistent with typical ambient air conditions and provide evidence that the risk of a viable ground gas or vapour contaminant linkage is very low to negligible.

As a measure of long-term betterment and good practice, it is recommended that service entry points into the building, such as ducts, conduits, and pipe penetrations through the ground floor, basement, and outbuilding, are appropriately sealed using suitable gas-resistant materials. This would minimise the potential for low-level gas ingress over time and provide resilience against any future changes in ground gas regime or ground conditions.

6 Instrumentation specifications

GGs instrumentation is maintained in accordance with the manufacturer recommendations and is serviced and calibrated annually. Note that for some instrumentation, cross sensitivity to other gases and significant environmental changes, such as temperature, pressure and humidity, should be taken into consideration when considering all site monitoring data.

The current calibration certificates and specification for all equipment used on site are presented in Appendix D.

7 ISO Accreditation and Professional Insurances

GGs are accredited to the following international standards:

- ISO 9001:2015 (Quality Management System);
- ISO 14001:2015 (Environmental Management System), and;
- ISO 45001: 2018 (Occupational Health and Safety Management System).

8 Limitations

GGS has prepared this factual report for the use of the Client and those parties whom a warranty agreement has been executed, or with whom an assignment has been agreed.

GGS accepts no responsibility for the consequences of this document being used for any purpose or project other than for which it was commissioned or for the consequences arising from this document's use by any third party with whom an agreement has not been executed.

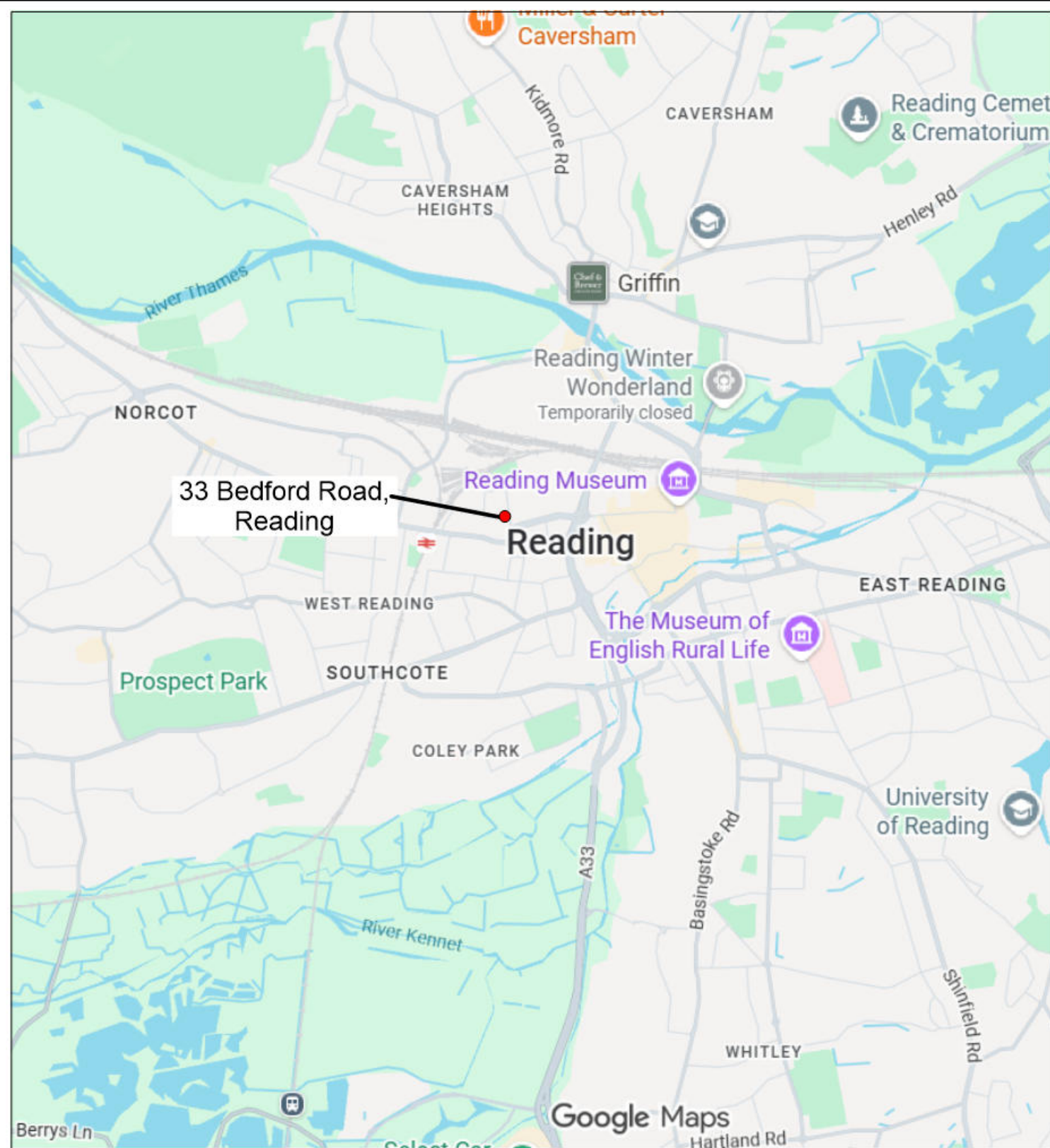
GGS accept no responsibility for the interpretation of this factual data. A reviewer of the data provided must take into account other available information and the context in which this data was collected. For example, site setting, conceptual site model, environmental conditions, gases present (that are not monitored as part of this contract, but may interfere with the sensors used), building design and construction practices during the monitoring period.

GGS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

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Appendix A

Site Location Plan



Title:
Site Location Plan

Project:
GGS4291 33 Bedford Road,
Reading

Drawing No:
GGS4291_SLP_01

Key:

— Approximate Site Boundary

Rev.	Date	Dwn.	Description	App'd
0	20/03/2026	EC	Final	AB

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ggs

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Continuous Monitoring

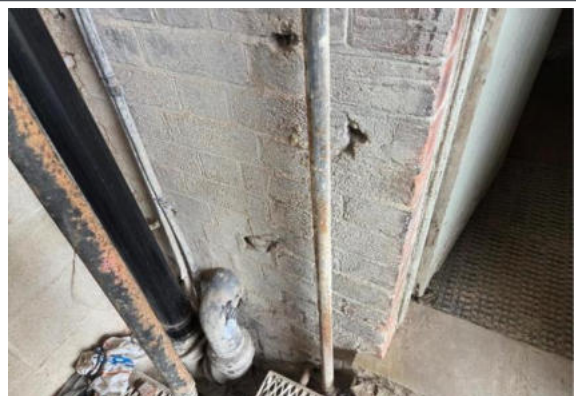
Ground Gas Solutions (GGS) Ltd.
Pythia House (Unit 10), Bamford Business Park
Hibbert Street, Stockport, SK4 1PL

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33 Bedford Road, Reading

Appendix B

Site Photographs

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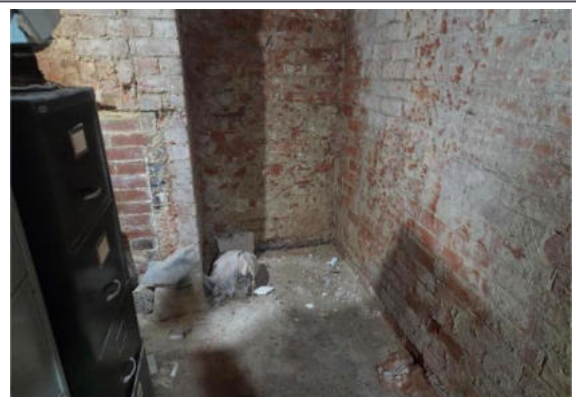
Service entries



Ground floor



Electrical service entry



Basement



Measurement at service entry



Outbuildings

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Appendix C

Gas Sweep Survey Records

10/03/2026



Weather: cloudy, 10 degrees. 11 km/h winds NE,
Falling pressure trend 1016 mb - 1007 mb
10:00 - 17:00.

Fresh air reading prior to internal
sweep survey: **0.8**
437
<0.1



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Ground Gas Solutions (GGS) Ltd.
Pythia House (Unit 10), Bamford Business Park
Hibbert Street, Stockport, SK4 1PL

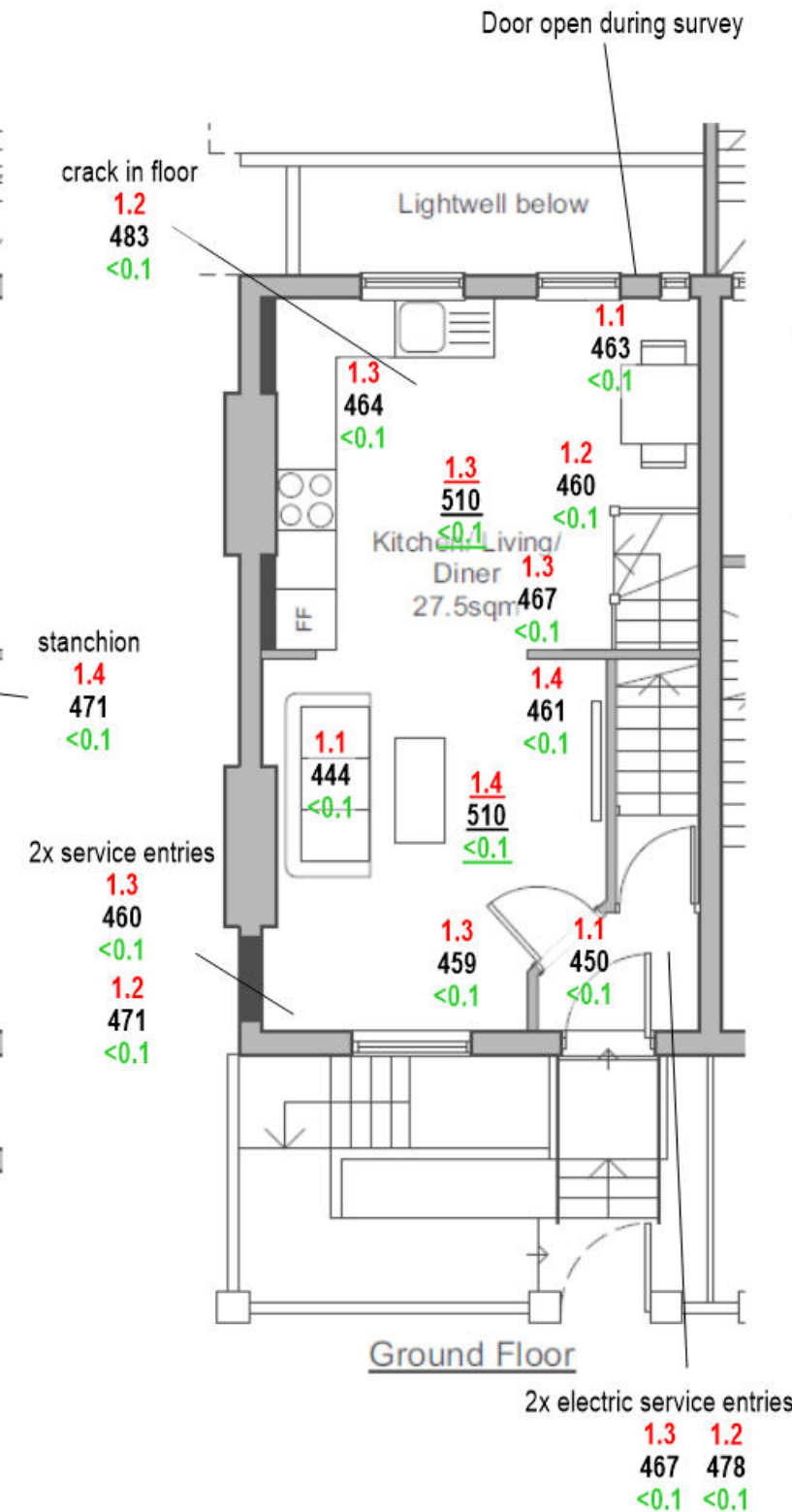
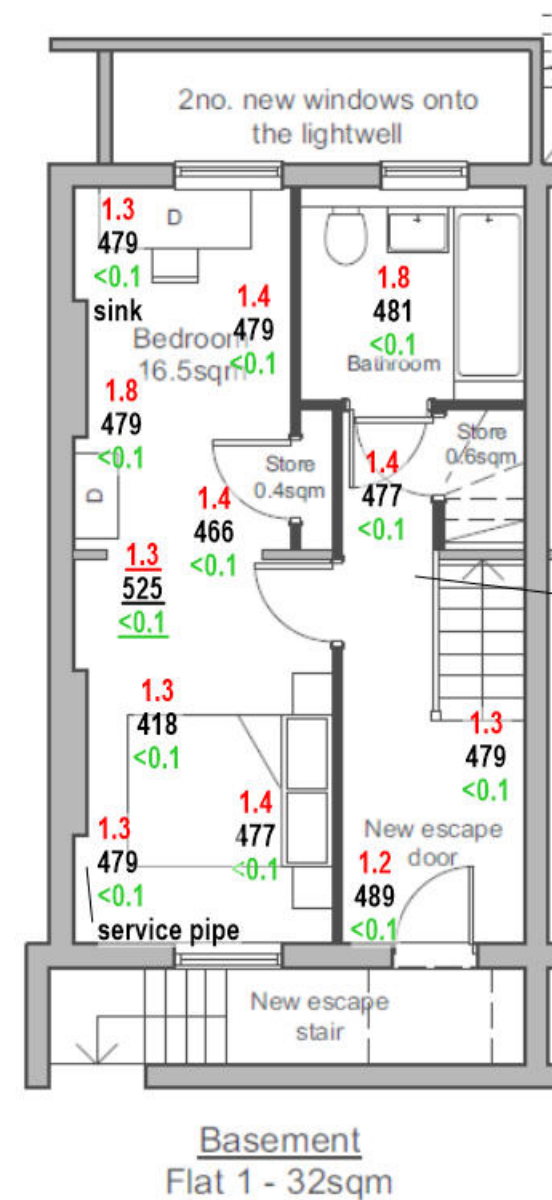
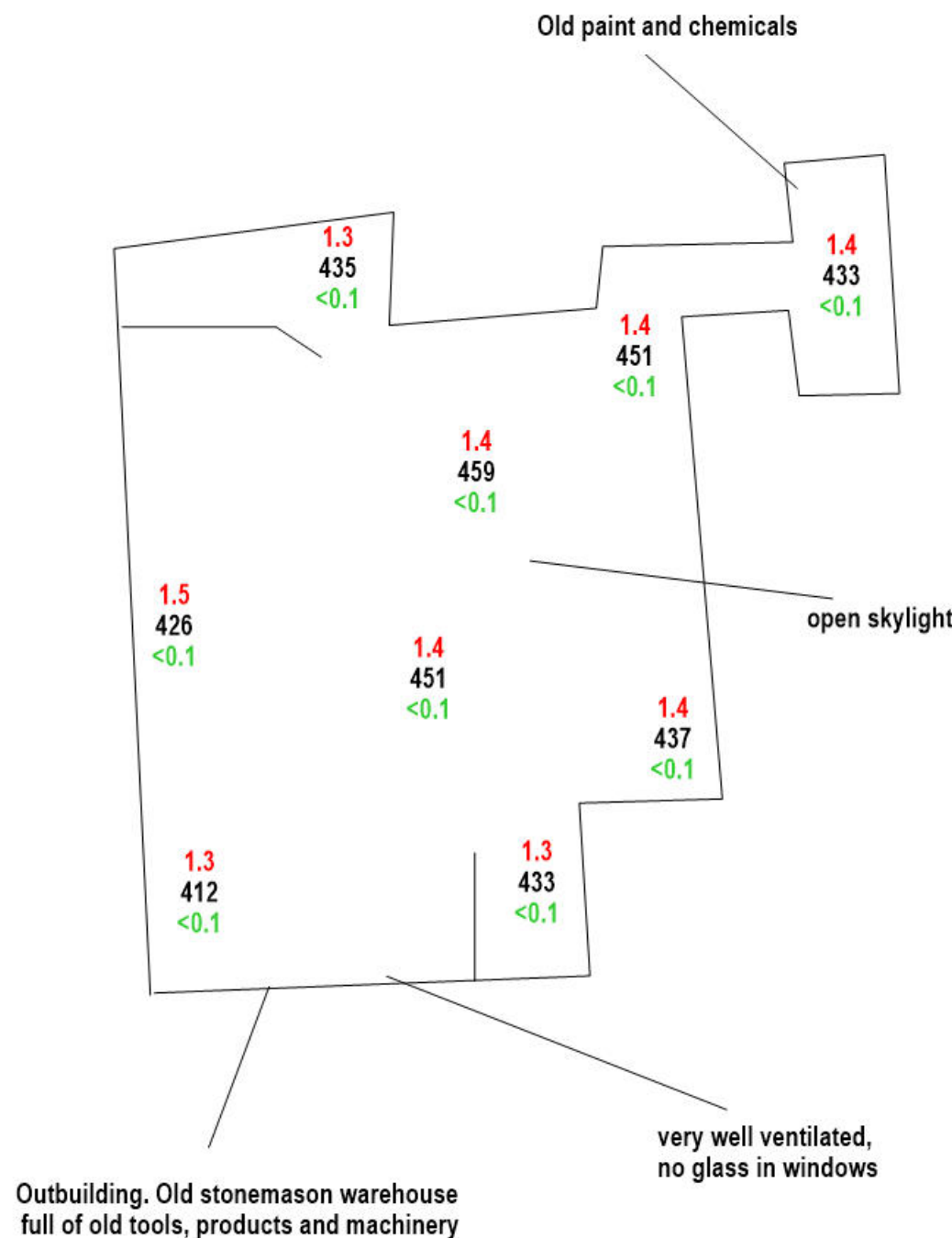
Title:
Internal Gas Sweep
Survey

Project:
GGS4291 33 Bedford Road,
Reading

Drawing No:
GGS4291_IGSS_10/03/26

Key:
CH₄: X
CO₂: XXX floor level
TVOC: XXX

CH₄: X
CO₂: XXX breathing height
TVOC: XXX



Note: All methane (CH₄), carbon dioxide (CO₂) and (TVOC) total volatile organic compounds measurements are to ppmv level.
Drawing not to scale - for illustrative purposes only.

Rev.	Date	Dwn.	Description	App'd
0	16/03/2026	MT	FINAL	AB

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Appendix D

Calibration Certificates & Instrument Specification

TEST DATE AND CONDITIONS	
Date	24/10/25
Atmospheric pressure	983 mb
Ambient Temp	18.6 °C
Envionics Serial No.	N/A

GAS DATA LTD	 GAS DATA LISTEN · ANALYSE · INFORM
Unit D,	
Earlplace Business Park,	
Coventry,	
CV4 9XL, UK	
+44 (0) 24 7630 3311	

GFM22x OUTWARD INSPECTION & QUALITY CHECK

INSTRUMENT DETAILS			
SO Number	Instrument Type	Instrument Serial Number	Job Number(s)
345602	GFM 226	13793	31431

Calibration Technician

DATE 23/10/25

Inspection Technician

DATE 24/10/25

INSTRUMENT CHECKS		Pass (P), Fail (F) or not applicable (NA)	INSTRUMENT PACKING LIST	Tick if included
Function Tests	Keyboard Test	P	Instrument	✓
	Backlight Test	P	Leather Case	✓
	Clock Set / Running	P	AC Battery Charger (UK)	✓
	Pump Flow Test	P	AC Battery Charger (EURO)	X
	Pump Fail Test	P	AC Battery Charger (US)	X
	Battery Charge Test	P	Gas Sample Pipe	✓
	Service Date	23/10/26	Operation Manual (hardcopy)	X
Channel Tests	Verify CO2/ AMB (see stability test)	P	Carry Case CUSTOMERS	✓
	Verify optional gases. (see cal cert)	N/A	Spares Pot	X
DataBase Checks	Jobcard(s) completed and signed	P	Allen Key	X
	Jobcard(s) booked off database	P	Extra Items:	
	Calibration certificate completed	P		
	Complete & print QI record	N/A		
Label Checks	Warranty / cal /label fitted	14272/P		

Comments:

TEST DATE AND CONDITIONS	
Date	23/10/25
Atmospheric pressure	981mb
Ambient Temp	19.2°C
Enviroics Serial No.	2518

GAS DATA LTD	
Unit D,	
Earlplace Business Park,	
Coventry,	
CV4 9XL, UK	
+44 (0) 24 7630 3311	

GFM226-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

INSTRUMENT DETAILS	
Serial No	Customer
13793	Ground Gas Solutions Ltd

INSTRUMENT CHECKS			
Keyboard	✓	Pump Flow	500cc/min
Display / Backlight	✓		
Clock Set / Running	✓	S/W Version	G226.0029/0002
Labels Fitted	✓	Recalibration Date	26/10/26

GAS CHECKS						
Calibration Gas		Instrument Gas Channels Read				
Gas Type	Applied Conc.	CO2 (ppm)	tol. (ppm)			tol. (% vol.)
N2	100%	0	+10			+0.1
CO2	400ppm	392	+/-40			+0.1
	1500ppm	1455	+/-100			+0.1
	10000ppm	9988	+/-500			+0.1

Notes:

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015, BS EN ISO 14001:2015 and BS EN ISO 45001:2018 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

Gas Data Ltd is certified to: BS EN ISO 9001:2015
BS EN ISO 14001:2015
BS EN ISO 45001:2018

Stability Test for GFM22x serial number: 13793 has passed

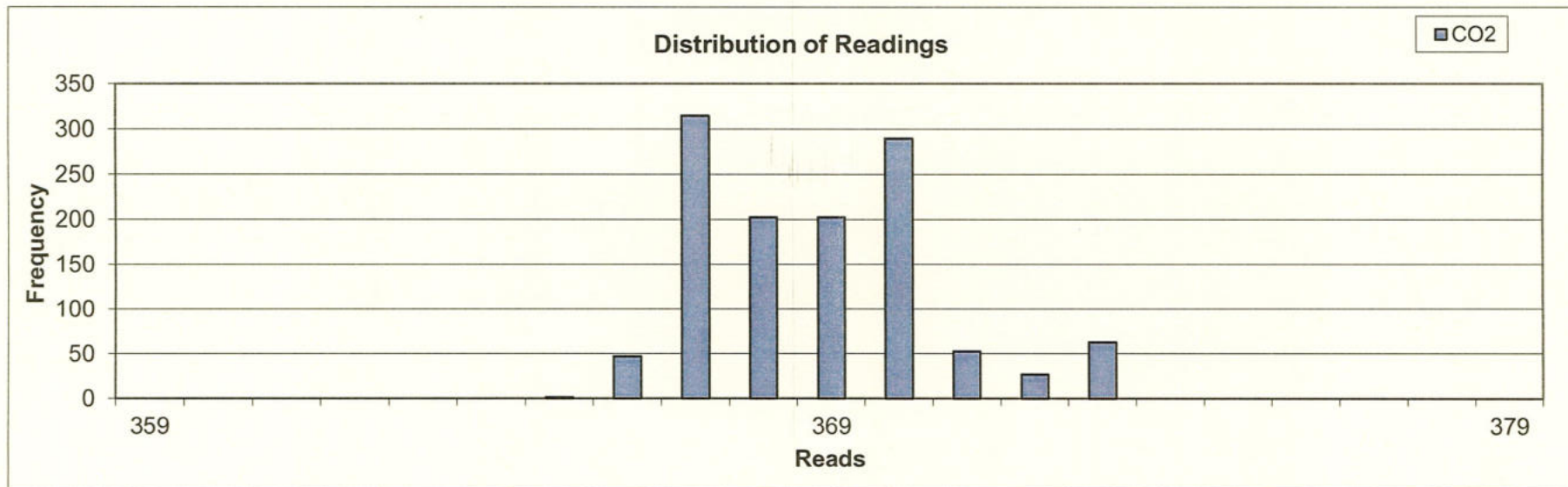
Import

Save

Print

Stability Test:	10 minutes (1200 tabs) of 400ppm CO2 flowing through the instrument.	
Date:	October 23, 2025	
Instrument:	13793	CO2 Reads
	Max Reads:	373
	Average Reads:	369
	Min Reads:	365

Frequency Distribution Results		
Within 1ppm	Within 5ppm	Within 10ppm
58.0%	100.0%	100.0%



Our Mission

For nearly 30 years Gas Data have been designing and developing fully engineered gas analysis techniques. Our expertise is focused around generation of sustainable green energies, such as biogas. Every day, we help businesses all over

the world to deliver clean energy through our safe, reliable and scientific data analysis. We believe that the environment is our responsibility, which is why we are dedicated to empowering environmental evolution.

GFM Series Features

- Small portable design that is easy to hold in one hand
- High contrast LCD display
- User swappable battery pack
- Battery life ranging from 8 - 12 hours, depending on model
- Maximum charging time of 4 hours
- Charger suited to your country
- Protective weather proof leather case
- Supplied in a ready-to-go site kit
- Annual recalibration interval



Servicing

To ensure they are always reliable and operating at the best efficiency level, we strongly recommend our clients to perform an annual service and recalibration by either, Gas Data or any Gas Data approved service centre. Gas Data annual services for

the GFM series instruments come at a fixed price and include a 12 month warranty, so that our clients can be certain of their annual maintenance costs and enjoy the peace of mind. This cost includes a full service, calibration and repair of your instrument

at no additional cost throughout the life cycle of the product (the only exclusions are damages caused by negligence and mishandling of the instruments). Temporary courtesy hire instruments are available.



GFM 226 Technical Specification

General

Ambient Temperature Range	-10°C to 40°C
Protection rating	IP65
Aspiration Rating	300ml/min minimum
Dimensions	200mm x 100mm x 60mm (approx.)
Typical Resonse Time	30 seconds

Gas Measurements

Channel	Sensor Type	Range	Resolution	Typical Accuracy
Carbon Dioxide	IR	0 - 10,000ppm	1ppm	± 100ppm
Oxygen	ECH	0 - 25%	0.1%	± 0.2%

GFM 226 Specific Features

- Ambient CO₂ level compensation
- Optional O₂ sensor
- Optional Data logger with USB download
- Available Sensor accessories:
 - Straight needle probe
 - Under door probe
 - 1m lance probe

The CO₂ HIDDEN PERSON DETECTOR equipment is used extensively by Police/Fire & Rescue and Military Search teams and by Immigration & Border Agencies searching for illegal immigrants and those evading capture. It has proved highly successful within the Prison Service community as well, for searching delivery vehicles leaving establishments.

Gill Boyd, Managing Director - Goddman Bentley

As well as carrying out visual searches of freight and vehicles, our officers use carbon dioxide probes, heartbeat detectors and sniffer dogs to detect the presence of people hiding in lorries.

Brian Hill - UK Border Agency assistant director at Harwich
Reported by BBC News

Customising gas and pressure combinations are not available on this model. The GFM 226 is a fixed configuration. All GFMs are available to hire or purchase. Please contact our team for details.

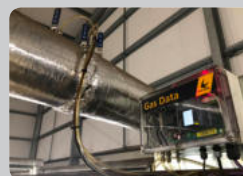
Other products available



Maintenance



Fixed System



Gas Flow Monitoring



ATEX Rated Systems

CERTIFICATE OF CALIBRATION

Issued By: Ecotec Solutions, Inc.

Calibration Date: April 15, 2025

Recommended Calibration: April 15, 2027

850 S Via Lata, Suite 115
Colton, CA 92324
909-906-1001

Certificate #: 202515043560717

www.ecotecco.com

Customer: Company Name GAS DATA LIMITED

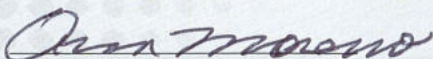
Description: Gas Analyzer
Serial Number: 3560717

Model: TDL-500

Calibration Results: The analyzer is considered to be in conformity with the specifications of reference.

Units	Gas	Certified Gas Concentration	Gas Traceability (Lot Number)	Instrument Reading	Tolerance
%	N ₂	99.999	N70086009803	0 PPM	± 2.5%
PPM	CH ₄	9.99 PPM	70086129308	10.2 PPM	± 2.5%
PPM	CH ₄	500 PPM	70086030712	489.6 PPM	± 2.5%
PPM	CH ₄	2499 PPM	70086811308	2689.7 PPM	± 10%
PPM	CH ₄	10000 PPM	109631206	10316.7 PPM	± 10%
PPM	CH ₄	20000 PPM	109631303	20456.6 PPM	± 10%
PPM	CH ₄	999700 PPM	MET-040918-UHP	1012480 PPM	± 10%

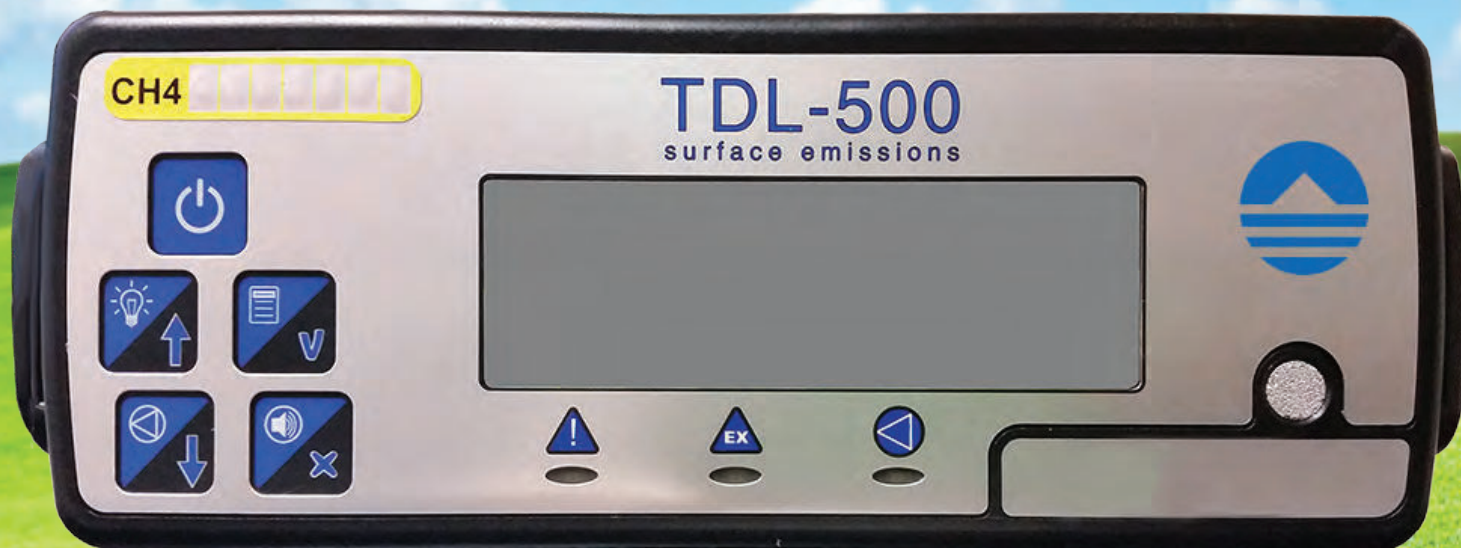
Calibration Technician: Ana Moreno

Signature: 

Date: April 15, 2025

This certificate is issued in accordance with laboratory requirements of the National Institute of Standards and Technology. It provides traceability of measurement to recognized national standards, and to units of measurement realized at the National Institute of Standards and Technology or other recognized national standards laboratories. Certification only applies to results shown. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Page 1 of 1



- 🌐 Newest Technology for Surface Emissions Monitoring
- 🌐 No Need for Hydrogen Gas Supply
- 🌐 Available with GPS Data Collection



Features

- PPM or % by volume
- Automatic self test at start up
- Visual and audible alarm indicators
- Choice of measurement modes
- Methane specific analyzer
- 8 hours constant use at 68°F
- Supplied with carrying case, sampling probe and filters



Key Benefits

- Low maintenance
- High resolution – 1ppm
- ATEX certified – safe use in explosive atmosphere
- Multiple measurement modes – simultaneous display
- Fast response times
- No need for hydrogen gas supply – as required by FID devices



Applications

- Fugitive Emissions
- Natural gas networks
- Methane leak detection

TDL-500

TUNABLE DIODE LASER
METHANE DETECTOR



Technical Specification

Gas Ranges

Response Time, T ⁹⁰	CH ₄	4.5 Seconds T10 standards: 2 seconds With suction rod T90: 6 seconds With suction rod T10: < 3.5 seconds
Gases Measured	CH ₄ by laser spectroscopy	
Range	CH ₄ 0-10,000 ppm and 0 to 100% gas volume	
Typical Accuracy	CH ₄ 0-1,000 ppm ± 2.5% CH ₄ 1,001 ppm-10,000 ppm ± 10%	

Facilities

Alarms	Visual (LED and LCD displays) and audio warnings Alarms include: Methane CH ₄ concentration threshold Explosion risk due to methane CH ₄ concentration Pump stopped or pump error
Status Indicators	Include: Battery charge level and Pump status (speed 1 or 2)
Gas Connection	Quick connect inlet coupling with locking mechanism: Gas Inlet
Keypad	5 Direct control keys Advanced function control with protected access scrolling menu

Power Supply

Battery Type	Either with rechargeable battery pack: 3 x 1.2 V - 4 A/h NiCd in accordance with ATEX directive OR with Alkaline type D batteries: 3 x 1.5 V alkaline cells in accordance with ATEX directive
Charge Time	Typical use: -8 hours at 68°F with all functions on (pump on speed 2) -6 hours at temperatures below 32°F with all functions on (pump speed 2) -6 hours at temperatures above 95°F with all functions on (pump speed 2)
Battery Charger	100 to 240 VAC/50-60 Hz battery charger for ATEX battery pack
Charge Time	Approximately 10-12 hours from full discharge

Pump

Output	55 l/h and 65 l/h - 2 speed pump with status indicator on display
--------	---

Environmental Conditions

Operating Temperature Range	5°F – 122°F (-10°C - 50°C)
Relative Humidity	0-95% non condensing
Case Seal	IP54
Barometric Pressure Accuracy	Atmospheric pressure 29.9 in Hg (± 3 in Hg)

Physical

Weight	6 lbs
Size	10.3 x 4.4 x 5.5 inches
Case Material	Polyamide reinforced with fibreglass and carbon. Front panel: anodised aluminium
Display	Liquid crystal display with digits, icons and backlighting 3 areas: Concentration measurements (0-10,000ppm and 0.0% to 100% gas volume) Status indicator and dialogue window Height of measurement character for ppm scale: 13mm Height of measurement character for gas scale: 13mm Storage

Certification Rating

ATEX	II 2G Ex ib IIA T1 Gb (Ta= -10°C to +50°C)
CE	CE Marking 94/9/CE directive dated March 23rd 1994 89/336/CE CEM directive dated May 23rd 1989 electromagnetic compatibility

Important Note: The information in this document is correct at the time of generation. We do, however, reserve the right to change the specification without prior notice as a result of continuing development.



Life-saving solutions

CERTIFICATE OF CALIBRATION

CALIBRATION CERTIFICATE NO: 83194

ISSUED BY: SHAWCITY LIMITED
DATE: 14/07/2025

APPROVED SIGNATORY:

NAME: Daniel Hunter

CUSTOMER: Ground-Gas Solutions Ltd
INSTRUMENT: PhoCheck Tiger - W-2B
SERIAL NUMBER: T-107622

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

WO459183-2

WO510392-3

The instrument has been factory calibrated to documented procedures in accordance with ISO9001:2015 Quality Management System.
The instrument is calibrated following manufacturer guidance.
Measurement standards are derived from volumetric and time sources which have been calibrated at an accredited laboratory traceable to national or international standards.

CALIBRATION RESULTS

REF. VALUE
100 ppm - Isobutylene
1000 ppm - Isobutylene

INDICATED VALUE
100 ppm - Isobutylene
1000 ppm - Isobutylene

Prior to calibration, the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference value is that generated by the certified source and the indicated value is that measured by the instrument.
Gas mixture prepared using equipment traceable to N.P.L standards against suppliers' certificate No.
On the day of calibration, the instrument was working according to the manufacturer's original specifications.

COMMENTS:

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$.
This provides a level of confidence of uncertainty of approximately 95%.
The uncertainty of measurement is ±2 %
The results indicate that the instrument conforms to the applicable parts of the published specification.

HEALTH & SAFETY, OCCUPATIONAL HYGIENE AND ENVIRONMENTAL MONITORING INSTRUMENTS

Tel: 01793 780622
www.shawcity.co.uk

Instrument House, 91-92 Shrivenham Hundred Business Park
Watchfield, Oxfordshire, SN6 8TY



Independently
verified as best
performing PID
technology



Tiger

Most advanced PID for Volatile Organic Compounds.



Tiger provides rapid, accurate detection of VOCs with exceptional resistance to humidity and contamination.

Best available photoionisation detection (PID)

- PID independently verified as best performing on the market
- Humidity resistant and anti-contamination design
- Unrivalled, accurate detection range from 1 ppb - 20,000 ppm
- Fast response time and clear down
- Internal gas table with over 480 VOCs & toxic compounds

Minimise downtime

- Fast start up with no complicated set up
- Battery life up to 24 hours continual use
- Simple icon driven menu requires minimal user training
- Direct USB connectivity for fast data download
- Instrument easily upgradeable via Ion Science website

Ease of use

- Intuitive, easy to use software
- Easy access sensor, electrode stack and lamps
- Large clear keypad and slim design allows one handed operation
- Keypad backlit in low light conditions

Safety

- Accurate results in all environmental conditions
- Intrinsically safe; meets ATEX, IECEx, UL and CSA standards

Low cost operation

- Inexpensive consumables and parts
- 5 year warranty when instrument registered online*

*Terms and conditions apply

Tiger is the most advanced hand held VOC detector on the market with the widest measurement range, accurately detecting gases down to ultra low ppb levels up to 20,000 ppm. Tiger has the fastest response time of just two seconds, and is as quick to clear down. Its internal gas table contains over 480 response factors.

The instrument's photoionisation detection (PID) technology has been independently verified as best performing on the market for speed, accuracy, resistance to humidity and contamination, thanks to its patented Fence Electrode Technology.

Its patented Fence Electrode Technology with three electrode format and Anti-contamination design ensures optimal performance within humid and difficult working conditions, extending run time in the field.

Tiger is ready to use with no complicated programming. The set up procedure can be done via a PC to perform basic functions. Direct connection from the instrument to the computer via a standard USB cable offers the fastest communication and data download available.

Batteries can be replaced in potentially explosive environments due to the innovative design. Low cost filters and lamps can be easily changed in seconds, minimising instrument downtime. Fast battery charging allows the instrument to be fully charged in six hours.

Tiger offers simple, one handed operation. Its rugged design and protective, removable rubber boot withstand the harshest environments. The large, clear back-lit display allows for easy viewing in any light condition. An integrated torch is designed for directing the instrument's probe into dimly lit areas. The illuminated keypad comes on when light is low.

Tiger is fully upgradeable. This allows lower cost instruments to be purchased with the option of adding functionality if needed, without having to return it to the factory for modification.

Extend your instrument warranty

Tiger has the lowest running costs on the market with inexpensive disposable parts, lamps and filters. Warranty can be extended from two to five years if the instrument is registered online within one month of purchase. Visit www.ionscience.com/instrument-registration

Applications include

- Environmental monitoring • Soil contamination detection • VOCs in landfill
- IAQ measuring industrial volatiles • Leakage in fuel and chemical storage
- Health & Safety • STEL & TWA monitoring • Confined space entry
- Screening tool for First Responders • VOC leak detection • Wing tank entry
- Medical gases within Hospitals • Fumigation gases • Fugitive emissions

Accessories

Tiger is supplied with an exclusive range of accessories. For more info visit: www.ionscience.com/tiger

Distributed by:

TECHNICAL SPECIFICATION

MINIMUM RESOLUTION *

1 ppb or 0.001 mg/m³

MAXIMUM READING * *

20,000 ppm or 20,000 mg/m³ (gas dependant)

RESPONSE TIME

T90 < 2 seconds

ACCURACY *

± 5% display reading ± one digit

LINEARITY *

± 5% display reading ± one digit

INTRINSICALLY SAFE APPROVALS

ATEX II 2G Ex ib IIC T4 (-15 °C ≤ Ta ≤ +45 °C)

IECEx ITS 10.0036X

US and Canadian approvals

BATTERY LIFE

Li-ion: life up to 24 hours continual use

Alkaline: (Duracell Procell MN 1500) life up to 8.5 hours continual use

LAMPS

10.6 eV Krypton PID lamp (standard) 10.0eV and 11.7eV lamps available

DATA LOGGING *

Including date / time: 120,000 points

COMMUNICATION

Direct USB 1.1 connection

CALIBRATION

Standard calibration 100ppm isobutylene

Custom calibration capability

ALARM

Flashing LED and 95 dBA at 300mm (12") audible sounder

Selectable vibrating alarm

Pre-programmed TWA and STEL*

Pre-programmed with over 480 gases*

FLOW RATE

220 ml/min in ambient conditions (with blocked flow alarm)

TEMPERATURE

Operating: -20 to 60 °C, -4 to 140 °F (non Intrinsically Safe)

Humidity: 0-99% RH (non condensing)

PROTECTION

Designed to IP65 (heavy rain)

CE 1180

EMC tested to EN61326-1:2006, EN50270:2006 & CFR 47:2008 Class A

WEIGHT & DIMENSIONS

Instrument without probe

Width: 340 x Height: 90 x Depth: 60 mm (13.4 x 3.6 x 2.4")

Standard case

420 x 320 x 97 mm (16.5 x 12.5 x 3.8")

Instrument weight 0.72 kg (1.56lb)

Packed weight: 5.5kg (12lb)

All specifications are against isobutylene calibration at 20 °C, 90% RH and up to 3000 ppm unless otherwise stated. *Model and gas dependent. **Maximum reading is achieved with certain analytes such as ethanol.

Manufactured by:

Ion Science Ltd

The Way, Fowlmere,

Cambs, SG8 7UJ, UK

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Tiger V1.2: This publication is not intended to form the basis of a contract and specifications can change without notice.



GRM

We understand land

GRM provide specialist ground, environmental, structural and design services for landowners and developers across the UK.

Our experience spans a wide range of sectors including private residential, social housing, healthcare, education, commercial, and industrial. Our sole aim is to maximise the potential of the site and thereby the commercial return for our clients.

Land Appraisal

Phase I Desk Studies | Phase II Site Investigations | Soakaway Testing
Environmental Impact Assessments & Reports | Due Diligence Audits

Environmental

Preliminary Risk Assessments | Detailed Quantitative Risk Assessments
Ground Gas Assessments | Material Management Plans
Remediation Strategies & Validation | Waste Classification Assessments

Mining

Coal Mining Risk Assessments | Coal Mining Investigations | Treatment of
Mine Workings | Mine Shafts | Subsidence | Mineral Resource Assessments

Geotechnical

Geotechnical Investigations | Earthworks | Slope Stability
Retaining Wall Design | Ground Stability | Vibration Assessments
Value Engineering | Settlement Analysis

Design

Detailed Foundation Schedules | Highways AIP's | Superstructure Design
Detailed Design of SUDS, Highways, and Sewer Structures

Site Services

Foundation Inspections | Gas Membrane Inspections
Remediation Inspections | Structural Inspections

GRM are proud to have provided services for a wide range of clients including

Bellway Homes | Vistry | Taylor Wimpey | Persimmon Homes | Barratt Redrow
NHS Trusts | Local Authorities | Severn Trent | VINCI | Tilbury Douglas
MOD | Structural and Civil Engineers

We also work with key partners to deliver a range of other support services and surveys including topographical, ecology, tree, archaeological, flood risk, and utilities.

Please contact us for an informal discussion on how we can save both time and money on your development project:

www.grm-uk.com | 01283 551249 | info@grm-uk.com