Geotechnical &
Environmental
Consultants

Our ref: D37124/PK

25th September 2020

Belmont Contractors Ltd.
14-19 Spitfire Park
Northfield Road
Market Deeping
PE6 8GY

For the attention of Mr C. Todd

Dear Clint

Re: Ground Gas Report – Old Main Road, Fleet Hargate

We have now completed the ground gas monitoring programme at the above site and are pleased to report as follows.

PROJECT UNDERSTANDING

We understand that the client (Belmont Contractors), are proposing to develop the site with nine low-rise residential properties with associated gardens.

PREVIOUS WORKS

The following report has previously been prepared for the site, which should be read in conjunction with this ground gas report:

- GeoDyne Limited Report entitled *'Old Main Road, Fleet Hargate – Combined Phase I Desk Study & Phase II Exploratory Investigation'* prepared for Seagate Homes, Ref. D37124, dated 31st October 2017.

We understand that since the production of the above report, Belmont Contractors have acquired the site from Seagate Homes.

In summary, the above report highlighted various on and off-site sources of potentially hazardous ground gas to the proposed development site. As part of the ground gas assessment of the site within the report, three monitoring visits were undertaken over a six-week period in October 2017. Based on the results of the monitoring, the site was classified as Characteristic Situation CS2, in accordance with Table 4 of BS 8485:2015 *'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*'.

The above referenced report made appropriate recommendations for floor slab and ground gas precautions based on a CS2 classification.

LOCAL AUTHORITY CONSULTATION

The client has provided us with comments received from the Environmental Protection Officer (EPO) at South Holland District Council in relation to the above referenced report.

These comments are presented in Appendix I. With regards to the issue of ground gas, the comments state *'The site has been classified as CS2, however only three ground gas monitoring visits have been undertaken. Generally, a minimum of 6 visits are required in order to consider the site adequately characterised'.*

We have been requested by the client, to undertake further ground gas monitoring at the site to satisfy the comments raised by the EPO.

SUPPLEMENTARY GROUND GAS MONITORING PROGRAMME

Pre-Start Works

A site visit was undertaken in August 2020 to attempt to audit the monitoring wells previously installed at the site in 2017 of part of our previous works (referenced in our previous report as BH1 to BH3). Unfortunately, none of the previous wells could be located and hence it was recommended to the client to install a series of new monitoring wells to obtain additional gas data from the site. It should be noted that our site visit revealed that the site had remained unchanged since our previous works in 2017.

Site Works

A window sampling borehole rig was mobilised to the site on 3rd September 2020 to advance five boreholes (WS1 to WS5) at the site, to a depth of 3.00m below existing ground level (begl). Four of these boreholes were installed with monitoring wells to facilitate a programme of ground gas monitoring (WS1 to WS4).

Boreholes WS1 to WS3 were targeted to the main body of the site covering the area of the proposed nine plots and to supplement the previous three wells installed in 2017 (i.e. boreholes BH1 to BH3). Borehole WS4 and WS5 were targeted to the northern extremity of the site (i.e. the proposed rear garden area of Plot 5) due to the presence of a former historical pond in this area, see below. It should be noted that access to the area of the former pond was not possible at the time of our previous site works in 2017.

A plan showing the approximate locations of the four recent monitoring wells together with locations of the previous monitoring wells installed in 2017 is presented in Appendix II of this report (Figure No. D37124/G1).

Ground Conditions

The ground conditions encountered in the window sampling boreholes advanced within the main body of the site (i.e. boreholes WS1 to WS3) confirmed the ground conditions encountered during our previous works in 2017. Beneath surface topsoil, the Natural Strata generally comprised firm SILT, which was noted to become soft to firm with depth. These deposits are considered to be typically representative of the Fenland Formation.

It should be noted that boreholes WS4 and WS5 were advanced in the northern extremity of the site (within the proposed rear garden area to Plot 5) in an attempt to target the former location of a historical pond, which was identified on the historical maps reviewed as part of our report in 2017. The ground conditions encountered in these two boreholes revealed Made Ground to depths of between 1.55m and 1.95m begl, respectively.

The Made Ground encountered in these two boreholes is considered to be representative of pond backfill materials and comprised loose to medium dense very silty sand and soft to firm very sandy silt. At the base of the Made Ground, a thin layer of black leaf remains were encountered, which is suspected to be the base of the former pond feature.

The logs of the window sampling boreholes are presented in Appendix III of this report together with the logs of the previous monitoring points installed in 2017.

Ground Gas Monitoring Results

The results of the previous three monitoring visits undertaken in 2017 together with the results of the three recent supplementary visits in September 2020 are presented in Appendix IV of this report and are summarised in Table 1.

TABLE 1 – SUMMARY OF GAS MONITORING DATA

Parameter	Minimum % by volume	Maximum % by volume
Methane	0.0	2.0
Carbon Dioxide	2.5	11.2
Oxygen	6.7	19.0
Flow (l/h)	0.0	0.0

Atmospheric pressure ranged between 993mb and 1026mb during the monitoring visits. It should be noted that the third visit in 2017 and the first and third visits in 2020 were undertaken during a period of falling atmospheric pressure.

Water was encountered within the borehole installations during the programme of monitoring, at variable depths ranging between 1.35m and 2.61m begl.

Appropriate Guidance

The results of the gas monitoring carried out in 2017 and September 2020 have been reviewed with reference to the following documentation:

British Standard & CIRIA

The results of the gas monitoring have been reviewed with reference to the following documentation:

- British Standard BS 8485 '*Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*' (2015+A1:2019).
- CIRIA Report C665 '*Assessing risks posed by hazardous ground gases to buildings*' (2007).

BS 8485 and CIRIA Report C665 recommend a risk-based methodology to ground gas assessment, which includes the calculation of a site-specific Gas Screening Value (GSV). The GSV of a particular ground gas regime equates to:

- GSV (L/h) = (maximum borehole flow rate (L/h) x maximum gas concentration)/100.

The GSV should be calculated for both methane and carbon dioxide to determine a site-specific Characteristic Situation for each gas. The higher the calculated GSV, the greater the risk posed by the presence of ground gas. The CIRIA guidance document notes that '*…the GSV is a guideline value and not an absolute threshold*'.

Table 2 of BS 8485 (reproduced below) presents a total of six Characteristic Situations (CS) to assist in classification of the site, based on the calculated GSVs for methane and carbon dioxide.

Table 2 **CS by site characteristic GSV**

CS	Hazard potential	Site characteristic GSV [A] L/h	Additional factors
CS1	Very low	<0.07	Typically <1% methane concentration and <5% carbon dioxide concentration (otherwise consider an increase to CS2)
CS2	Low	0.07 to <0.7	Typical measured flow rate <70 L/h (otherwise consider an increase to CS3)
CS3	Moderate	0.7 to <3.5	–
CS4	Moderate to high	3.5 to <15	–
CS5	High	15 to <70	–
CS6	Very high	>70	–

[A] The figures used in this column are empirical.

NOTE The CS is equivalent to the characteristic GSV in CIRIA C665 [6].

In accordance with BS 8485, the CS classification for the site should be considered in conjunction with the proposed Building Type to determine the appropriate level of ground gas protection measures that should be installed to mitigate the risk posed by ground gases, based on the gas protection score for the site.

BS 8485 notes '*The construction and use of the building, together with the control of future structural changes to the building and its maintenance (the building's management) should be assessed, since potential risks posed by ground gases are strongly influenced by these factors*'. Subject to the development proposals, each building may be categorised as a whole, or for each different part of the building.

The Building Types are presented in Table 3 of BS 8485, reproduced below.

Table 3 **Building types**

	Type A	Type B	Type C	Type D
Ownership	Private	Private or commercial/ public, possible multiple	Commercial/ public	Commercial/ industrial
Control (change of use, structural alterations, ventilation)	None	Some but not all	Full	Full
Room sizes	Small	Small/ medium	Small to large	Large industrial/ retail park style

Summary of Building Types (taken from BS 8485)

Type A Buildings	Examples include private housing and some retail premises.
Type B Buildings	Examples include managed apartments, multiple occupancy offices, some retail premises and parts of some public buildings (such as schools, hospitals, leisure centres) and parts of hotels.
Type C Buildings	Examples include offices, some retail premises and parts of some public buildings (such as schools, hospitals, leisure centres and parts of hotels).
Type D Buildings	Examples are retail park sales buildings, factory shop floor areas, warehouses. (Small rooms within these style buildings should be separately categorized as Type B or Type C).

Table 4 of BS 8485, reproduced below, should be used to derive the minimum level of gas protection applicable to the Building Type, based on the CS determined from the calculated GSV.

Table 4 — *Gas protection score by CS and type of building*

CS	Minimum gas protection score (points)			
	High risk		Medium risk	Low risk
	Type A building	Type B building	Type C building	Type D building
1	0	0	0	0
2	3.5	3.5	2.5	1.5
3	4.5	4	3	2.5
4	6.5 [A]	5.5 [A]	4.5	3.5
5	— [B]	[A1] 6 [A1] [A]	5.5	4.5
6	— [B]	— [B]	[A1] — [B] [A1]	[A1] 6 [A1]

[A] Residential buildings should not be built on CS4 or higher sites unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.

[B] The gas hazard is too high for this empirical method to be used to define the gas protection measures.

The appropriate level of precautions, to be designed in accordance with the point scoring system of BS 8485 should therefore be applied for the proposed development. These should include a combination of the following three types of protection measures, which should be used to achieve the required score:

- The structural barrier of the floor slab, or of the basement slab and walls if a basement is present;
- Ventilation measures; and
- Gas resistant membrane.

The points achieved for each element of the ground gas precautions are summarised in Tables 5, 6 and 7 of the British Standard. These tables are reproduced below.

Table 5 — *Gas protection scores for the structural barrier*

Floor and substructure design (see Annex A.)	Score [A]
Precast suspended segmental subfloor (i.e. beam and block)	0
Cast in situ ground-bearing floor slab (with only nominal mesh reinforcement)	0.5
Cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations	1 or 1.5 [B]
Basement floor and walls conforming to BS 8102:2009, Grade 2 waterproofing [C] [A1] [D] [A1]	2
Basement floor and walls conforming to BS 8102:2009, Grade 3 waterproofing [C] [A1] [D] [A1]	2.5

[A] The scores are conditional on breaches of floor slabs, etc., being effectively sealed.

[B] To achieve a score of 1.5 the raft or suspended slab should be well reinforced to control cracking and have minimal penetrations cast in (see **A.2.2.2**).

[C] The score is conditional on the waterproofing [A1] being provided by a suitable structural barrier with the design and detailing of the walls and floor meeting the requirements for Type B protection. The score cannot be assigned for Type A (waterproof membrane) or Type C (drained cavity wall). [A1]

[D] [A1] If a membrane is installed beneath and around the basement to provide Type A waterproofing (BS 8102:2009), it can be assigned a gas protection score in accordance with Table 7, if it meets all the criteria for a gas resistant membrane in that table. [A1]

Table 6 — *Gas protection scores for ventilation protection measures*

Protection element/system	Score	Comments
(a) Pressure relief pathway (usually formed of low fines gravel or with a thin geocomposite blanket or strips terminating in a gravel trench external to the building)	0.5	Whenever possible a pressure relief pathway (as a minimum) should be installed in all gas protection measures systems. If the layer has a low permeability and/or is not terminated in a venting trench (or similar), then the score is zero.

Table 6 *(continued)*

Protection element/system	Score	Comments
(b) Passive sub floor dispersal layer: Very good performance: Good performance: Media used to provide the dispersal layer are: • Clear void • Polystyrene void former blanket • Geocomposite void former blanket • No-fines gravel layer with gas drains • No-fines gravel layer	2.5 1.5	Performance criteria for methane and carbon dioxide are shown in Figure B.6 and Figure B.7, respectively. The ventilation effectiveness of different media depends on a number of different factors including the transmissivity of the medium, the width of the building, the side ventilation spacing and type and the thickness of the layer. The selected score should be assigned taking into account the recommendations in Annex B. Passive ventilation should be designed to meet at least "good performance", see Annex B.
(c) Active dispersal layer, usually comprising fans with active abstraction (suction) from a subfloor dilution layer, with roof level vents. The dilution layer may comprise a clear void or be formed of geocomposite or polystyrene void formers	1.5 to 2.5	This system relies on continued serviceability of the pumps, therefore alarm and response systems should be in place. There should be robust management systems in place to ensure the continued maintenance of the system, including pumps and vents. Active ventilation should always be designed to meet at least "good performance", as described in Annex B.
(d) Active positive pressurization by the creation of a blanket of external fresh air beneath the building floor slab by pumps supplying air to points across the central footprint of the building into a permeable layer, usually formed of a thin geocomposite blanket	1.5 to 2.5	This system relies on continued operation of the pumps, therefore alarm and response systems should be in place. The score assigned should be based on the efficient "coverage" of the building footprint and the redundancy of the system. Active ventilation should always be designed to meet at least "good performance".
(e) Ventilated car park (floor slab of occupied part of the building under consideration is underlain by a basement or undercroft car park)	4	Assumes that the car park is vented to deal with car exhaust fumes, designed to *Buildings Regulations 2000, Approved Document F* [9].

Table 7 — *Gas protection score for the gas resistant membrane*

Protection element/system	Score	Comments
Gas resistant membrane meeting all of the following criteria: • sufficiently impervious 〈A1〉 , both in the sheet material [A)] and in the sealing of sheets and sealing around sheet penetrations, to prevent any significant passage of methane and/or carbon dioxide through the membrane; 〈A1〉 • sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions; • 〈A1〉 *Text deleted* 〈A1〉 • sufficiently strong 〈A1〉 [B)] 〈A1〉 to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc); 〈A1〉 and to withstand in-service stresses (e.g. settlement if placed below a floor slab); 〈A1〉 • capable, after installation, of providing a complete barrier to the entry of the relevant gas; and • verified in accordance with CIRIA C735 [N1].	2	The performance of membranes is heavily dependent on the quality and design of the installation, resistance to damage after installation and integrity of joints. 〈A1〉 *Text deleted* 〈A1〉 If a membrane is installed that does not meet all the criteria in column 1 then the score is zero.

[A)] 〈A1〉 A membrane with a methane gas transmission rate <40.0 ml/day/m²/atm (average) for sheets and joints (tested in accordance with BS ISO 15105-1:2007 manometric method) is regarded as sufficiently impervious.

[B)] For example, reinforced LDPE (virgin polymer) membranes having a minimum mass per unit area of 370 g/m² and not significantly less than 0.4 mm thickness between the reinforcement scrim (tested in accordance with Procedure D (2 mm diameter tip) of BS EN ISO 9863-1:2016) installed above floor slabs are considered sufficiently strong to meet the performance criteria (see also **C.3**). Thicker and more robust membranes or an additional membrane protection layer should be installed directly beneath cast-in-situ floor slabs. 〈A1〉

Ground Gas Analysis

The ground gas monitoring has identified a maximum methane concentration of 2.0% v/v and a maximum carbon dioxide concentration of 11.2% v/v. Measurable flow rates were not recorded during the monitoring visits. In the absence of a measurable flow rate, the limit of detection of the gas monitoring instrument (0.1 l/h) should be utilised.

The GSV for methane at the site may be calculated as follows:

- (0.1 x 2.0)/100 = 0.002 l/h

The GSV for carbon dioxide at the site may be calculated as follows:

- (0.1 x 11.2)/100 = 0.0112 l/h

Therefore, with a maximum GSV of 0.0112 l/h, a methane concentration of 2.0% v/v and a carbon dioxide concentration of 11.2% v/v, the site may be classified as **'CS2'** with respect to methane and carbon dioxide, in accordance with Table 2 of BS 8485 and based on the visits undertaken.

Building Type

We understand that it is proposed to construct nine low-rise residential properties at the site. In accordance with Table 3 of BS 8485, **Building Type A** is considered to be the most appropriate classification.

Gas Protection Score

On the basis of Characteristic Situation (CS2) and the development proposals with a building that may be designated as Building Type A and in accordance with Table 4 of BS 8485, the minimum gas protection score for the site is **3.5 points**.

CONCLUSIONS & RECOMMENDATIONS

Floor Slab Design & Ground Gas Precautions

Based on the results of the ground gas monitoring undertaken in 2017 and more recently in September 2020, and the development proposals, the site falls into Characteristic Situation CS2, in accordance with Table 4 of BS 8485(2015+A1:2019). The minimum gas protection score for the site is 3.5 points.

Therefore, the recommendations stated within Section 8.6 of our previous Combined Report for the site (referenced on Page 1) continue to apply.

Ground Gas Protection Measures Verification

In order to accord with Table 7 of BS8485 where a gas resistant membrane is proposed as part of gas protection measures, the membrane should be installed, inspected and validated by a third party in accordance with the requirements of CIRIA C735 *'Good practice on the testing and verification of protection systems for buildings against hazardous ground gas'* (2014), for the gas protection points associated with installation of a gas resistant membrane to apply.

We would recommend that the membrane specified for the proposed buildings is installed by a suitably qualified specialist contractor in a quality controlled / quality assured (QA/QC) manner. The membrane must be suitably robust to withstand the construction process and should be suitably protected following installation and inspection to minimise damage during construction.

Verification of the membrane should include a third party visual inspection of the installed membrane, as a minimum, and may require integrity testing such as air lancing of the joints, dependent on the qualifications of the installer and the characteristic situation of the site. Otherwise a score of zero is awarded for the membrane and therefore the installed solution would fail to comply with BS 8485.

Once the design of ground gas precautions for the site have been finalised, we would recommend the following information in included within a site specific Verification Plan, to be prepared in accordance with CIRIA guidance, to assist with verification of the gas protection measures.

- Drawings showing the proposed membrane installation details, inclusive of how membrane penetrations (i.e. service pipes, stanchions etc.), door entries and corners will be sealed.
- Technical specification data for the gas resistant membrane(s) to be installed at the site, together with Local Authority approval for its use.
- Method Statement for the installation of the membrane, prepared by the membrane installers.
- Details of the membrane installers relevant experience / qualifications.

Following installation, the ground gas protection measures should be visually inspected (as far as practicable) to ensure they are in accordance with the appropriate installation drawings and that the membranes are suitably installed and free from damage and defects.

The inspections should be carried out in accordance with good practice and should include the following as a minimum. Further details will be provided within the Verification Plan.

- Obtain photographic records of the membrane during the installation process.
- Visual inspection of the joints / welds in the membrane to assess the continuity of the membrane throughout the structure. Integrity testing should be undertaken, as appropriate.
- Visual inspection of the seals around penetrations through the membranes (i.e. service pipes, stanchions etc.). Integrity testing should be undertaken, as appropriate.
- Records of all materials used on site will be obtained during our inspection.
- Records of any deviation from the 'Construction' drawings and photographic evidence of any changes to the installation detail will be obtained.
- Records of any non-compliances (i.e. punctures/tears to the membrane, defective joints/seals etc.) and corrective action taken to rectify the defective areas will be obtained.

Following satisfactory installation of the membrane and satisfactory repair to any defective / damaged areas of the membrane, the membrane will be considered to 'Pass' the verification process. Validation report(s) relating to the membrane installation may be prepared on a rolling basis, as appropriate. Validation works should be undertaken at the earliest opportunity following installation, to minimise the potential for delays in construction etc.

The Client should note that following inspection, the membranes should be appropriately protected during construction to minimise damage. The protection may comprise the provision of loose laid boarding over the membrane, or implementation of an exclusion zone preventing other Contractors access into the plots/structures prior to pouring of the floor. Any damage to the membrane will compromise the efficacy of the membrane and should be appropriately repaired.

The foregoing strategy is also recommended for any third party responsible for validation works of the proposed residential buildings.

Statutory Consultation

We would recommend that a copy of this report is issued by the Client to the Local Authority (and NHBC or other Warranty Provider, if necessary) for review/comment and approval prior to commencing with the development of the site.

We trust the above is suitable for your current requirements. If you have any queries, please do not hesitate to contact us.

Yours sincerely
For and on the behalf of GeoDyne Limited



Paul Kershaw
Director

Encl	Appendix I	Comments from Environmental Protection Officer
	Appendix II	Plan Showing Approximate Location of Monitoring Wells (Figure No. D37124/G1)
	Appendix III	Borehole Logs (BH1 to BH3 and WS1 to WS5)
	Appendix IV	Ground Gas & Water Level Monitoring Results (2017 and 2020)
	Appendix V	Conditions & Limitations

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APPENDIX I

Comments from Environmental Protection Officer

Online Comment

Application	H05-0459-20
Location	Land off Old Main Road Fleet Hargate Spalding
Proposal	Details of Conditions 3, 4, 6, 7, 8, 9, 11, 12, 14, 15, 18, 19, 20, 21, 22 and 23 of H05-1235-18.

Name	Sue Armour
Address	Environmental Protection Officer SHDC PE11 2XE
Date Submitted	10-07-20
For/Against	Comments

I have reviewed the GeoDyne Limited report 'Old Main Road Fleet Hargate Combined Phase I Desk Study & Phase II Exploratory Investigation For Seagate Homes' ref D37124 Combined Report V1.0 dated 31st October 2017 I am in general agreement with the findings, but am unable to recommend discharge of condition X at the current time. I make the following comments:
Please could the consultant clarify the situation with the near surface soils? The logs and text note that the site is underlain by topsoil, but the plates are labelled as 'made ground'.

There has been no investigation at all into the area of the former pond. This comprises the majority of the garden area of plot 5, and as such some investigation in this area is required.

The site has been classified as CS2, however only three ground gas monitoring visits have been undertaken. Generally, a minimum of 6 visits are required in order to consider the site adequately characterised.

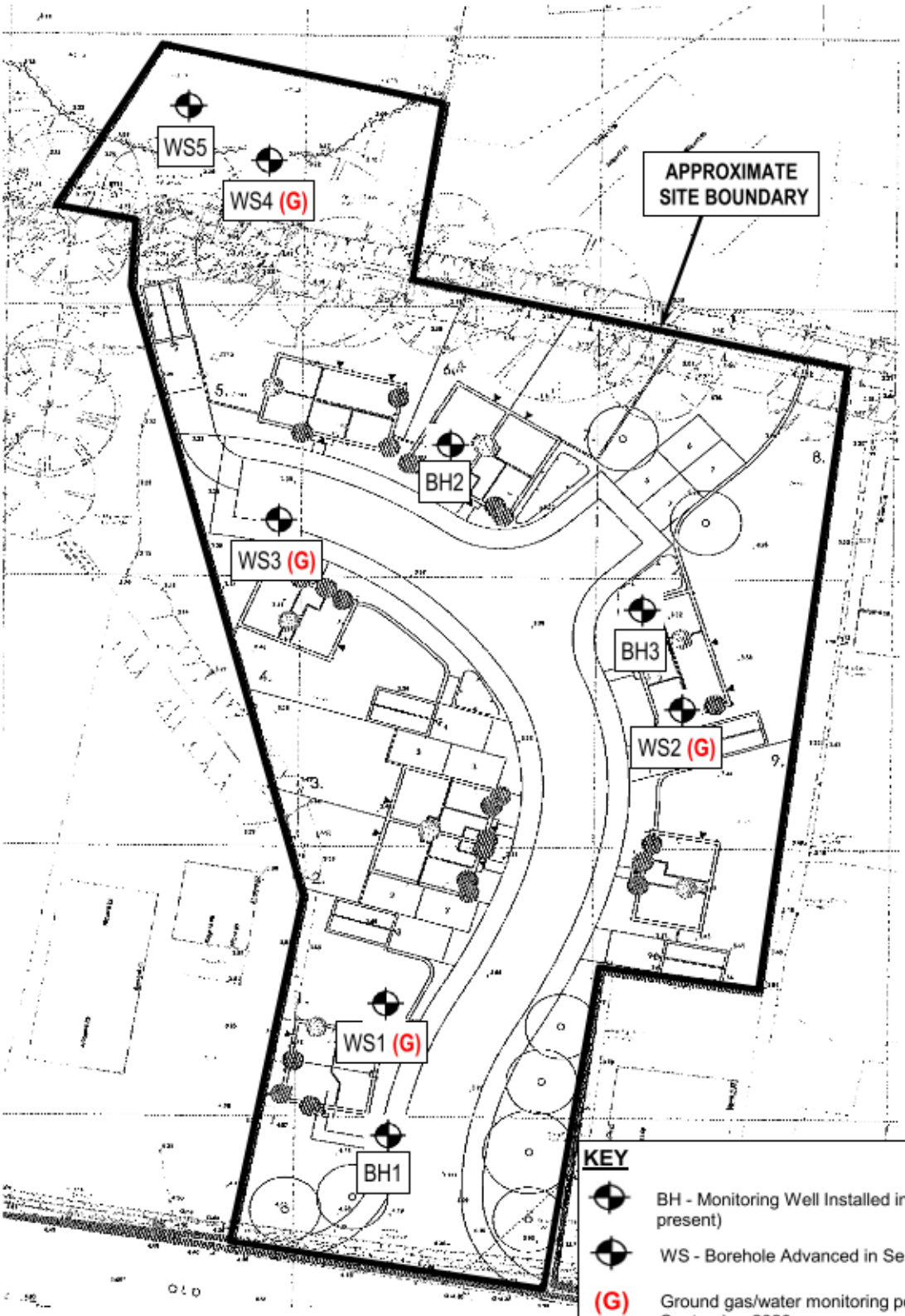
No details of the proposed ground gas protection measures have been submitted at this stage. Guidance as to the requirements, including the need for validation, can be found in the document 'YALPAG Technical Guidance - Verification requirements for gas protection systems v1.1' which can be downloaded from https://www.sholland.gov.uk/article/11653/Planning-Application-Consultations-Condition-Discharge

As such, I recommend that part i of condition 22 of H05-1235-18 be discharged, with parts ii-iv outstanding.

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APPENDIX II

Plan Showing Approximate Location of Monitoring Wells
(Figure No. D37124/G1)



REPRODUCED FROM THE DRAWING ENTITLED 'CONSTRUCTION SITE LAYOUT'. PRODUCED BY STUDIO 11 ARCHITECTS, DRAWING NO. 356.CSL.01, DATED 30.01.2019. USED EDITED AND REPRODUCED WITH THE PERMISSION OF THE CLIENT.

Project No.	D37124	Drawn	SJ
Client	Belmont Contractors Ltd	Checked	PK
Project	Old Main Road Fleet Hargate	Approved	PK
		Scale	NTS
		Date Drawn	22/09/2020
Title	Plan Showing Approximate Locations of Monitoring Wells	Rev.	
		Figure No.	**D37124/G1**

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APPENDIX III

Borehole Logs
(BH1 to BH3 and WS1 to WS5)

GeoDyne
9 Brunel Parkway, Pride Park, Derby DE24 8HR
Tel: 01332 290798
email: info@geodyne.co.uk

BH1

Project No. D37124

Sheet 1 of 2

Samples and Tests				Description of Strata	Legend	Depth & (Thickness) (m)	Casing (m)	Ground-water	Installation
Depth (m)	Type	Sample Ref	SPT "N" Value						
				Dark brown slightly sandy clayey very silty topsoil (TOPSOIL)		(0.40)			
				Firm light brown sandy SILT (FENLAND FORMATION)		0.40 (0.50)			
1.20 - 1.65	C		6	Firm light brown slightly clayey very sandy SILT (FENLAND FORMATION)		0.90			
2.00 - 2.45	C		4			(3.00)			
3.00 - 3.45	C		2						
4.00 - 4.45	C		10	Loose to medium dense grey very silty organic fine to medium SAND (FENLAND FORMATION)		3.90			
5.00 - 5.45	C		8						
6.50 - 6.95	S		10			(5.40)			
8.00 - 8.45	C		9						
9.50 - 9.95	S		8	Firm grey silty sandy gravelly CLAY. Gravel is fine to coarse subrounded to subangular quartzite (FENLAND FORMATION)		9.30 9.50			
				Stiff grey-brown sandy gravelly CLAY. Gravel is fine to coarse subrounded to subangular quartzite (FENLAND FORMATION)					

Remarks

1.Sides generally stable.
2.Water encountered at 4.00m which rose to 3.90m after 20mins.
3.Plain pipe installed from ground level to 1.00m with a bentonite surround. Slotted pipe installed from 1.00m to 4.00m.
4.Bung, valve and lockable cover installed.

Key

D = Disturbed Sample
U = Undisturbed Sample
B = Bulk Sample
J = Jar Sample
V = Vial Sample
W = Water Sample

S = Standard Penetration Test (Split Spoon)
C = Standard Penetration Test (Cone)
= Water Strike (m)
= Steady Water Level (m)

Project:	Old Main Road, Fleet Hargate			**Client:**	Seagate Homes		
Logged:	CB	**Checked:**	RS	**Field Book Ref:**	**Plant:**	Competitor Rig	**Drawing Ref:**
Date:	22/09/2017	**Approved:**	RS	CB17/01	**Scale:**	1:50	BH1

GeoDyne
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BH1

Project No. D37124

Sheet 2 of 2

Samples and Tests				Description of Strata	Legend	Depth & (Thickness) (m)	Casing (m)	Ground-water	Installation
Depth (m)	Type	Sample Ref	SPT "N" Value						
11.00 - 11.45	S		12	Stiff grey-brown sandy gravelly CLAY. Gravel is fine to coarse subrounded to subangular quartzite (FENLAND FORMATION)		(4.10)			
12.50 - 12.95	S		33						
14.00 - 14.45	S		38	Stiff grey-brown slightly sandy gravelly CLAY. Gravel is fine to coarse subrounded to subangular chalk (AMPTHILL CLAY FORMATION)		13.60 (3.40)	14.00		
15.50 - 15.95	S		34						
17.00 - 17.45	S		38	End of Borehole at 17.00m		17.00			

Remarks

1.Sides generally stable.
2.Water encountered at 4.00m which rose to 3.90m after 20mins.
3.Plain pipe installed from ground level to 1.00m with a bentonite surround. Slotted pipe installed from 1.00m to 4.00m.
4.Bung, valve and lockable cover installed.

Key

D = Disturbed Sample
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W = Water Sample

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C = Standard Penetration Test (Cone)
= Water Strike (m)
= Steady Water Level (m)

Project:	Old Main Road, Fleet Hargate			**Client:**	Seagate Homes		
Logged:	CB	**Checked:**	RS	**Field Book Ref:**	**Plant:**	Competitor Rig	**Drawing Ref:**
Date:	22/09/2017	**Approved:**	RS	CB17/01	**Scale:**	1:50	BH1

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BH2

Project No. D37124

Sheet 1 of 2

Samples and Tests				Description of Strata	Legend	Depth & (Thickness) (m)	Casing (m)	Ground-water	Installation
Depth (m)	Type	Sample Ref	SPT "N" Value						
				Dark brown slightly sandy clayey very silty topsoil (TOPSOIL)		(0.30) 0.30			
				Firm light brown sandy very silty CLAY (FENLAND FORMATION)					
1.20 - 1.65	S		6			(1.80)			
2.00 - 2.45	S		3			2.10			
				Firm brown slightly clayey very sandy SILT (FENLAND FORMATION)					
3.00 - 3.45	S		3			(1.50)		▼	
				Loose to medium dense grey very silty organic fine to medium SAND (FENLAND FORMATION)		3.60			
4.00 - 4.45	S		10						
				...peat band from 4.70m to 4.90m					
5.00 - 5.45	S		15					▼	
				...occasional shells from 6.10m					
6.50 - 6.95	S		6			(9.10)			
8.00 - 8.45	S		11						
9.50 - 9.95	S		7						

Remarks

1.Sides generally stable.
2.Water encountered at 5.20m which rose to 3.10m after 20minutes.
3.Plain pipe installed from ground level to 1.00m with a bentonite surround. Slotted pipe installed from 1.00m to 5.00m.
4.Bung, valve and lockable cover installed.

Key

D = Disturbed Sample
U = Undisturbed Sample
B = Bulk Sample
J = Jar Sample
V = Vial Sample
W = Water Sample

S = Standard Penetration Test (Split Spoon)
C = Standard Penetration Test (Cone)
▽ = Water Strike (m)
▼ = Steady Water Level (m)

Project:	Old Main Road, Fleet Hargate			**Client:**	Seagate Homes		
Logged:	CB	**Checked:**	RS	**Field Book Ref:**	**Plant:**	Competitor Rig	**Drawing Ref:**
Date:	21/09/2017	**Approved:**	RS	CB17/01	**Scale:**	1:50	BH2

GeoDyne
9 Brunel Parkway, Pride Park, Derby DE24 8HR
Tel: 01332 290798
email: info@geodyne.co.uk

BH2

Project No. D37124

Sheet 2 of 2

Samples and Tests				Description of Strata	Legend	Depth & (Thickness) (m)	Casing (m)	Ground-water	Installation
Depth (m)	Type	Sample Ref	SPT "N" Value						
11.00 - 11.45	S		11						
				...occasional fine to coarse subrounded to subangular gravel from 12.10m					
12.50 - 12.95	S		32						
				Dense brown very sandy fine to coarse subrounded to subangular quartzite GRAVEL with occasional limestone quartzite cobbles (FENLAND FORMATION)		12.70 (0.40) 13.10			
				Stiff grey-brown slightly sandy gravelly CLAY. Gravel is fine to coarse subrounded to subangular chalk (AMPTHILL CLAY FORMATION)			13.50		
14.00 - 14.45	S		40						
						(3.90)			
15.50 - 15.95	S		32						
17.00 - 17.45	S		33	End of Borehole at 17.00m		17.00			

Remarks

1.Sides generally stable.
2.Water encountered at 5.20m which rose to 3.10m after 20minutes.
3.Plain pipe installed from ground level to 1.00m with a bentonite surround. Slotted pipe installed from 1.00m to 5.00m.
4.Bung, valve and lockable cover installed.

Key

D = Disturbed Sample
U = Undisturbed Sample
B = Bulk Sample
J = Jar Sample
V = Vial Sample
W = Water Sample

S = Standard Penetration Test (Split Spoon)
C = Standard Penetration Test (Cone)
= Water Strike (m)
= Steady Water Level (m)

Project:	Old Main Road, Fleet Hargate			**Client:**	Seagate Homes		
Logged:	CB	**Checked:**	RS	**Field Book Ref:**	**Plant:**	Competitor Rig	**Drawing Ref:**
Date:	21/09/2017	**Approved:**	RS	CB17/01	**Scale:**	1:50	BH2

GeoDyne
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BH3

Project No. D37124

Sheet 1 of 1

Samples and Tests				Description of Strata	Legend	Depth & (Thickness) (m)	Casing (m)	Ground-water	Installation
Depth (m)	Type	Sample Ref	SPT "N" Value						
				Dark brown slightly sandy clayey very silty topsoil (TOPSOIL)		(0.40)			
						0.40			
				Firm brown mottled orange slightly clayey sandy SILT (FENLAND FORMATION)					
1.20 - 1.65	C		7						
2.00 - 2.45	C		4			(2.90)			
3.00 - 3.45	C		1						
				Loose grey very silty organic fine SAND (FENLAND FORMATION)		3.30			
						(0.70)			
4.00 - 4.45	S		7	End of Borehole at 4.00m		4.00	4.00		

Remarks

1.Sides generally stable.
2.No water encountered.
3.Plain pipe installed from ground level to 1.00m with a bentonite surround. Slotted pipe installed from 1.00m to 4.00m.
4.Bung, valve and lockable cover installed.

Key

D = Disturbed Sample
U = Undisturbed Sample
B = Bulk Sample
J = Jar Sample
V = Vial Sample
W = Water Sample

S = Standard Penetration Test (Split Spoon)
C = Standard Penetration Test (Cone)
▽ = Water Strike (m)
▼ = Steady Water Level (m)

Project:	Old Main Road, Fleet Hargate			**Client:**	Seagate Homes		
Logged:	CB	**Checked:**	RS	**Field Book Ref:**	**Plant:**	Competitor Rig	**Drawing Ref:**
Date:	20/09/2017	**Approved:**	RS	CB17/01	**Scale:**	1:50	BH3

GeoDyne
9 Brunel Parkway, Pride Park, Derby DE24 8HR
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email: info@geodyne.co.uk

WS1

Project No. D37124

Sheet 1 of 1

Samples and Tests				Description of Strata	Legend	Depth & (Thickness) (m)	Casing (m)	Ground-water	Installation
Depth (m)	Type	Sample Ref	SPT "N" Value						
				Dark brown slightly sandy clayey very silty TOPSOIL (TOPSOIL)		(0.40)			
				Firm light brown mottled orange very sandy SILT (FENLAND FORMATION)		0.40			
				...becoming light brown below approximately 1.00m					
				...becoming soft to firm and damp below approximately 1.20m					
				...becoming wet below approximately 1.50m				▽	
						(2.60)			
				End of Borehole at 3.00m		3.00	3.00		

Remarks

1.Borehole cased to 3.00m as a precautionary measure.
2.Water encountered at approximately 1.50m.
3.Plain pipe installed from ground level to 1.00m in a bentonite surround. Slotted pipe installed from 1.00m to 3.00m in a gravel surround.
4.Bung, valve and lockable cover installed.

Key

D = Disturbed Sample
U = Undisturbed Sample
B = Bulk Sample
J = Jar Sample
V = Vial Sample
W = Water Sample

S = Standard Penetration Test (Split Spoon)
C = Standard Penetration Test (Cone)
▽ = Water Strike (m)
▼ = Steady Water Level (m)

Project:	Old Main Road, Fleet Hargate			**Client:**	Belmont Contractors Ltd.		
Logged:	PK	**Checked:**	PK	**Field Book Ref:**	**Plant:**	Competitor Rig	**Drawing Ref:**
Date:	03/09/2020	**Approved:**	PK	PK2019/02	**Scale:**	1:20	WS1

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Tel: 01332 290798
email: info@geodyne.co.uk

WS2

Project No. D37124

Sheet 1 of 1

Samples and Tests				Description of Strata	Legend	Depth & (Thickness) (m)	Casing (m)	Ground-water	Installation
Depth (m)	Type	Sample Ref	SPT "N" Value						
				Dark brown slightly sandy clayey very silty TOPSOIL (TOPSOIL)		(0.30) 0.30			
				Firm light brown mottled orange very sandy SILT (FENLAND FORMATION)					
				...becoming light brown-grey below approximately 1.00m					
				...becoming soft to firm and damp below approximately 1.30m					
				...becoming wet below approximately 1.70m		(2.70)		▽	
				End of Borehole at 3.00m		3.00	3.00		

Remarks

1.Borehole cased to 3.00m as a precautionary measure.
2.Water encountered at approximately 1.70m.
3.Plain pipe installed from ground level to 1.00m in a bentonite surround. Slotted pipe installed from 1.00m to 3.00m in a gravel surround.
4.Bung, valve and lockable cover installed.

Key

D = Disturbed Sample
U = Undisturbed Sample
B = Bulk Sample
J = Jar Sample
V = Vial Sample
W = Water Sample

S = Standard Penetration Test (Split Spoon)
C = Standard Penetration Test (Cone)
▽ = Water Strike (m)
▼ = Steady Water Level (m)

Project:	Old Main Road, Fleet Hargate			**Client:**	Belmont Contractors Ltd.		
Logged:	PK	**Checked:**	PK	**Field Book Ref:**	**Plant:**	Competitor Rig	**Drawing Ref:**
Date:	03/09/2020	**Approved:**	PK	PK2019/02	**Scale:**	1:20	WS2

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email: info@geodyne.co.uk

WS3

Project No. D37124

Sheet 1 of 1

Samples and Tests				Description of Strata	Legend	Depth & (Thickness) (m)	Casing (m)	Ground-water	Installation
Depth (m)	Type	Sample Ref	SPT "N" Value						
				Dark brown slightly sandy clayey very silty TOPSOIL (TOPSOIL)					
				Firm light brown very sandy SILT (FENLAND FORMATION)		0.25			
				...becoming light brown mottled orange below approximately 1.00m					
				...becoming soft to firm and damp below approximately 1.35m					
				...becoming wet below approximately 1.80m		(2.75)			
				End of Borehole at 3.00m		3.00	3.00		

Remarks

1.Borehole cased to 3.00m as a precautionary measure.
2.Water encountered at approximately 1.80m.
3.Plain pipe installed from ground level to 1.00m in a bentonite surround. Slotted pipe installed from 1.00m to 3.00m in a gravel surround.
4.Bung, valve and lockable cover installed.

Key

D = Disturbed Sample
U = Undisturbed Sample
B = Bulk Sample
J = Jar Sample
V = Vial Sample
W = Water Sample
S = Standard Penetration Test (Split Spoon)
C = Standard Penetration Test (Cone)
▽ = Water Strike (m)
▼ = Steady Water Level (m)

Project:	Old Main Road, Fleet Hargate			**Client:**	Belmont Contractors Ltd.		
Logged:	PK	**Checked:**	PK	**Field Book Ref:**	**Plant:**	Competitor Rig	**Drawing Ref:**
Date:	03/09/2020	**Approved:**	PK	PK2019/02	**Scale:**	1:20	WS3

GeoDyne
9 Brunel Parkway, Pride Park, Derby DE24 8HR
Tel: 01332 290798
email: info@geodyne.co.uk

WS4

Project No. D37124

Sheet 1 of 1

Samples and Tests				Description of Strata	Legend	Depth & (Thickness) (m)	Casing (m)	Ground-water	Installation
Depth (m)	Type	Sample Ref	SPT "N" Value						
				Dark brown slightly sandy clayey very silty TOPSOIL (TOPSOIL)		0.15			
0.30 - 0.40	D	T1		Loose to medium dense brown very silty sand (MADE GROUND)		(0.80)			
0.95 - 1.00	D	T2		Loose to medium dense dark grey and brown very silty sand with occasional root remains and slight organic odour (MADE GROUND)		0.95			
				Soft to firm grey-brown mottled dark grey very sandy silt (MADE GROUND)		1.20			
				Soft to firm grey-brown very sandy silt with a thin layer of black leaf remains. Suspected base of former pond (MADE GROUND)		1.45			
				Soft to firm grey-brown very sandy SILT (FENLAND FORMATION)		1.55			
				...becoming damp with depth		(1.45)			
				End of Borehole at 3.00m		3.00	3.00		

Remarks

1.Borehole cased to 3.00m as a precautionary measure.
2.No water encountered.
3.Plain pipe installed from ground level to 1.00m in a bentonite surround. Slotted pipe installed from 1.00m to 3.00m in a gravel surround.
4.Bung, valve and lockable cover installed.

Key

D = Disturbed Sample
U = Undisturbed Sample
B = Bulk Sample
J = Jar Sample
V = Vial Sample
W = Water Sample
S = Standard Penetration Test (Split Spoon)
C = Standard Penetration Test (Cone)
= Water Strike (m)
= Steady Water Level (m)

Project:	Old Main Road, Fleet Hargate			**Client:**	Belmont Contractors Ltd.		
Logged:	PK	**Checked:**	PK	**Field Book Ref:**	**Plant:**	Competitor Rig	**Drawing Ref:**
Date:	03/09/2020	**Approved:**	PK	PK2019/02	**Scale:**	1:20	WS4

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9 Brunel Parkway, Pride Park, Derby DE24 8HR
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email: info@geodyne.co.uk

WS5

Project No. D37124

Sheet 1 of 1

Samples and Tests				Description of Strata	Legend	Depth & (Thickness) (m)	Casing (m)	Ground-water	Installation
Depth (m)	Type	Sample Ref	SPT "N" Value						
				Dark brown slightly sandy clayey very silty TOPSOIL (TOPSOIL)		0.15			
				Firm mixture of brown and grey-brown very sandy silt with rare limestone gravel (MADE GROUND)					
0.50 - 0.60	D	T3				(0.80)			
				...with a limestone cobble at 0.80m					
				Soft to firm grey-brown very sandy silt (MADE GROUND)		0.95			
1.10 - 1.20	D	T4				(0.95)			
				Soft to firm dark grey-brown very sandy silt with a thin layer of black leaf remains. Suspected base of former pond (MADE GROUND)		1.90 1.95			
				Soft to firm grey-brown very sandy SILT (FENLAND FORMATION)		(1.05)			
				...becoming firm with depth					
				End of Borehole at 3.00m		3.00	3.00		

Remarks
1.Borehole cased to 3.00m as a precautionary measure.
2.No water encountered.

Key
D = Disturbed Sample
U = Undisturbed Sample
B = Bulk Sample
J = Jar Sample
V = Vial Sample
W = Water Sample
S = Standard Penetration Test (Split Spoon)
C = Standard Penetration Test (Cone)
= Water Strike (m)
= Steady Water Level (m)

Project:	Old Main Road, Fleet Hargate			**Client:**	Belmont Contractors Ltd.		
Logged:	PK	**Checked:**	PK	**Field Book Ref:**	**Plant:** Competitor Rig		**Drawing Ref:**
Date:	03/09/2020	**Approved:**	PK	PK2019/02	**Scale:** 1:20		WS5

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APPENDIX IV

Ground Gas & Water Level Monitoring Results (2017 & 2020)

GeoDyne
9 Brunel Parkway
Pride Park
Derby
DE24 8HR

Tel: 01332 290 798

Project No.	D37124
Client	Seagate Homes
Site Location	Old Main Road, Fleet Hargate
Date	02/10/2017
Weather	Windy & cloudy
Atmospheric Pressure Range (mb)	1007
Equipment	GEO11 (DERBY) & dipmeter
Operator	CB

MONITORING OF SOIL GASES AND GROUNDWATER - IN ACCORDANCE WITH CIRIA C665

Borehole No.	Peak / Steady	Methane (% v/v)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Gas Flow (l/h)	Depth to Groundwater (mbgl)	Time to steady reading (secs)	Other Issues i.e. odour, condition of installation, etc
BH1	Peak	0.0	2.7	17.1	0.0	1.98	NA	Monitored for 130 seconds
	Steady	0.0	2.7	17.1	0.0			
BH2	Peak	0.0	3.5	18.9	0.0	1.45	45	Monitored for 170 seconds
	Steady	0.0	3.5	18.9	0.0			
BH3	Peak	0.0	5.4	12.8	0.0	1.35	50	Monitored for 150 seconds
	Steady	0.0	5.4	12.8	0.0			
Ambient		0.0	0.0	20.9	N/A	N/A	N/A	

Notes

Cell is highlighted in the following conditions

1. Where Methane exceeds 1% v/v (after BR212)
2. Where Carbon Dioxide exceeds 5% v/v (after BR212)

N/A - Not Applicable/ Not Available
ND - Not Determined
NGW - No groundwater encountered

GeoDyne
9 Brunel Parkway
Pride Park
Derby
DE24 8HR

Tel: 01332 290 798

Project No.	D37124
Client	Seagate Homes
Site Location	Old Main Road, Fleet Hargate
Date	12/10/2017
Weather	Overcast & windy
Atmospheric Pressure Range (mb)	1016
Equipment	GEO09 (NOTTINGHAM) & dipmeter
Operator	HW

MONITORING OF SOIL GASES AND GROUNDWATER - IN ACCORDANCE WITH CIRIA C665

Borehole No.	Peak / Steady	Methane (% v/v)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Gas Flow (l/h)	Depth to Groundwater (mbgl)	Time to steady reading (secs)	Other Issues i.e. odour, condition of installation, etc
BH1	Peak	0.0	2.5	17.2	0.0	2.00	50	Monitored for 120 seconds
	Steady	0.0	2.5	17.2	0.0			
BH2	Peak	0.0	3.7	19.0	0.0	1.52	45	Monitored for 120 seconds
	Steady	0.0	3.7	19.0	0.0			
BH3	Peak	0.0	4.9	13.4	0.0	1.42	50	Monitored for 120 seconds
	Steady	0.0	4.9	13.4	0.0			
Ambient		0.0	0.0	20.9	N/A	N/A	N/A	

Notes

Cell is highlighted in the following conditions

1. Where Methane exceeds 1% v/v (after BR212)
2. Where Carbon Dioxide exceeds 5% v/v (after BR212)

N/A - Not Applicable/ Not Available
ND - Not Determined
NGW - No groundwater encountered

GeoDyne
9 Brunel Parkway
Pride Park
Derby
DE24 8HR

Tel: 01332 290 798

Project No.	D37124
Client	Seagate Homes
Site Location	Old Main Road, Fleet Hargate
Date	16/10/2017
Weather	Overcast & windy
Atmospheric Pressure Range (mb)	1012
Equipment	GEO09 (NOTTINGHAM) & dipmeter
Operator	HW

MONITORING OF SOIL GASES AND GROUNDWATER - IN ACCORDANCE WITH CIRIA C665

Borehole No.	Peak / Steady	Methane (% v/v)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Gas Flow (l/h)	Depth to Groundwater (mbgl)	Time to steady reading (secs)	Other Issues i.e. odour, condition of installation, etc
BH1	Peak	0.0	2.6	17.2	0.0	2.00	50	Monitored for 120 seconds
	Steady	0.0	2.6	17.2	0.0			
BH2	Peak	0.0	5.3	7.0	0.0	1.54	40	Monitored for 120 seconds
	Steady	0.0	5.3	7.0	0.0			
BH3	Peak	0.0	4.6	13.7	0.0	1.54	45	Monitored for 120 seconds
	Steady	0.0	4.6	13.7	0.0			
Ambient		0.0	0.0	20.9	N/A	N/A	N/A	

Notes

Cell is highlighted in the following conditions

1. Where Methane exceeds 1% v/v (after BR212)
2. Where Carbon Dioxide exceeds 5% v/v (after BR212)

N/A - Not Applicable/ Not Available
ND - Not Determined
NGW - No groundwater encountered

Project No.	D37124
Client	Belmont Contractors Ltd.
Site Location	Old Main Road, Fleet Hargate
Date	09-09-2020
Weather	Warm and largely sunny
Atmospheric Pressure Trend	Fall of 1mb in the 24 hour period prior to monitoring
Equipment	GA2000+ & Dipmeter
Operator	BP

MONITORING OF SOIL GASES AND GROUNDWATER - IN ACCORDANCE WITH CIRIA C665 / BS8485:2015

Borehole No.	Time (00:00)	Ambient Pressure (mb)		Methane (% v/v)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Time to steady gas readings (secs)	Duration of gas monitoring (secs)	Gas Flow (l/hr)	Depth to groundwater (m begl)	Other Issues i.e. odour, condition of installation, etc
WS1	12:44	1021	Peak	0.0	1.9	17.7	35	120	0.0	1.96	
			Steady	0.0	1.9	17.7			0.0		
WS2	12:58	1021	Peak	0.0	1.4	15.1	45	120	0.0	1.63	
			Steady	0.0	1.4	15.1			0.0		
WS3	13:08	1021	Peak	0.0	1.6	16.1	30	120	0.0	1.69	
			Steady	0.0	1.6	16.1			0.0		
WS4	13:17	1021	Peak	2.0	10.2	6.7	230	300	0.0	2.61	
			Steady	1.9	10.2	6.7			0.0		
Ambient				0.0	0.0	20.6					

Notes

Cell is highlighted in the following conditions

1. Where Methane exceeds 1% v/v (after BR212)
2. Where Carbon Dioxide exceeds 5% v/v (after BR212)
3. Where Oxygen is below 16% (Coal Authority guidance)

Where cell is highlighted further consideration of the recorded value is required in accordance with the specified guidance documents

NA - Not Applicable/ Not Available

BOH - Bottom of Hole

ND - Not Determined

NGW - No groundwater encountered

NR - None Recorded

Project No.	D37124
Client	Belmont Contractors Ltd.
Site Location	Old Main Road, Fleet Hargate
Date	16/09/2020
Weather	Dry, cloudy
Atmospheric Pressure Trend	Rise of 9mb in the 24 hour period prior to monitoring
Equipment	GA2000+ & Dipmeter
Operator	CEH

MONITORING OF SOIL GASES AND GROUNDWATER - IN ACCORDANCE WITH CIRIA C665 / BS8485:2015											
Borehole No.	**Time (00:00)**	**Ambient Pressure (mb)**		**Methane (% v/v)**	**Carbon Dioxide (% v/v)**	**Oxygen (% v/v)**	**Time to steady gas readings (secs)**	**Duration of gas monitoring (secs)**	**Gas Flow (l/hr)**	**Depth to groundwater (m begl)**	**Other Issues i.e. odour, condition of installation, etc**
WS1	**13:30**	**1026**	**Peak**	**0.0**	**2.2**	**18.0**	**200**	**350**	**0.0**	**2.14**	
			Steady	**0.0**	**2.2**	**18.0**			**0.0**		
WS2	**13:20**	**1026**	**Peak**	**0.0**	**2.4**	**15.5**	**25**	**120**	**0.0**	**1.79**	
			Steady	**0.0**	**2.4**	**15.6**			**0.0**		
WS3	**13:10**	**1026**	**Peak**	**0.0**	**2.6**	**15.0**	**45**	**350**	**0.0**	**1.86**	
			Steady	**0.0**	**2.0**	**15.9**			**0.0**		
WS4	**12:58**	**1026**	**Peak**	**0.1**	**9.6**	**10.2**	**85**	**350**	**0.0**	**2.52**	
			Steady	**0.1**	**8.7**	**11.4**			**0.0**		
Ambient				**0.0**	**0.0**	**20.6**					

Notes

Cell is highlighted in the following conditions

1. Where Methane exceeds 1% v/v (after BR212)
2. Where Carbon Dioxide exceeds 5% v/v (after BR212)
3. Where Oxygen is below 16% (Coal Authority guidance)

Where cell is highlighted further consideration of the recorded value is required in accordance with the specified guidance documents

NA - Not Applicable/ Not Available

BOH - Bottom of Hole

ND - Not Determined

NGW - No groundwater encountered

NR - None Recorded

Project No.	D37124
Client	Belmont Contractors Ltd.
Site Location	Old Main Road, Fleet Hargate
Date	24/09/2020
Weather	Cloudy, rain showers
Atmospheric Pressure Trend	Fall of 5mb in the 24 hour period prior to monitoring
Equipment	GA2000+ & Dipmeter
Operator	PK

MONITORING OF SOIL GASES AND GROUNDWATER - IN ACCORDANCE WITH CIRIA C665 / BS8485:2015

Borehole No.	Time (00:00)	Ambient Pressure (mb)		Methane (% v/v)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Time to steady gas readings (secs)	Duration of gas monitoring (secs)	Gas Flow (l/hr)	Depth to groundwater (m begl)	Other Issues i.e. odour, condition of installation, etc
WS1	11:55	993	Peak	0.0	2.7	18.2	30	120	0.0	2.24	
			Steady	0.0	2.7	18.2			0.0		
WS2	12:05	993	Peak	0.0	3.4	16.6	40	120	0.0	1.87	
			Steady	0.0	3.4	16.6			0.0		
WS3	12:13	993	Peak	0.0	3.5	15.3	35	120	0.0	1.94	
			Steady	0.0	3.5	15.3			0.0		
WS4	12:21	993	Peak	0.1	11.2	7.8	220	350	0.0	2.55	
			Steady	0.1	11.2	7.8			0.0		
Ambient				0.0	0.0	20.6					

Notes

Cell is highlighted in the following conditions

1. Where Methane exceeds 1% v/v (after BR212)
2. Where Carbon Dioxide exceeds 5% v/v (after BR212)
3. Where Oxygen is below 16% (Coal Authority guidance)

Where cell is highlighted further consideration of the recorded value is required in accordance with the specified guidance documents

NA - Not Applicable/ Not Available

BOH - Bottom of Hole

ND - Not Determined

NGW - No groundwater encountered

NR - None Recorded

GeoDyne

APPENDIX V

Conditions & Limitations

Conditions & Limitations

Phase I Desk Studies

1. Works undertaken to provide the basis of the Phase I Desk Study report comprise a review of information available from a number of sources/parties (potentially also including the Client) together with a walk over of the site (where applicable and included within the quotation). The opinions given in the Phase I Desk Study are based on the information available from third parties/sources that has been obtained within the available timeframe. GeoDyne Limited assumes all third party information to be true and correct and therefore cannot accept liability for the accuracy of such information supplied.

2. Should additional information become available that may affect the comments and opinions made within the Phase I Desk Study, GeoDyne Limited reserves the right to review such information and make modifications to comments/opinions as appropriate.

3. It should be borne in mind that a Phase I Desk Study collates available information to generate a conceptual model of the site. The actual geotechnical and environmental considerations can only be fully quantified by intrusive investigation works to confirm the accuracy of the conceptual site model.

Phase II Intrusive Investigations

1. Our quotation assumes that access to the site will be arranged by others at no cost to ourselves.

2. We have assumed that free access is available throughout to the entire site and that works can be undertaken during a single mobilisation. Where restricted access is encountered, or where additional unscheduled mobilisations are required, additional costs may be incurred to the client.

3. We have assumed that all available information relating to buried services will be supplied by the Client at no cost to ourselves. No responsibility will be accepted for damage to underground services that have not been brought to our prior attention by the Client.

4. All excavations/boreholes will be backfilled with compacted arisings upon completion, with any excess arisings left proud of ground levels. Excess arisings will not be removed from the site unless specifically requested by the Client. Where we are requested to remove excess arisings, all associated costs will be passed to the Client.

5. We will attempt to leave the site in a clean and tidy state, however, it must be understood that some disturbance of the site is unavoidable during intrusive works.

6. Exploratory holes are positioned approximately on site by GeoDyne Limited. Should the client require precise locations of all exploratory points, additional fees will be incurred. It must be borne in mind that backfilled trial pits can create 'soft spots', therefore, should the Client wish to designate 'no dig' zones, for example under the footprint of proposed structures, these must be brought to our attention prior to commencement of works.

7. Groundwater observations relate to conditions encountered at the time of investigation. It must be understood that groundwater levels may vary as a result of recent climatic conditions or seasonal variation.

8. Trial pits and boreholes examine only a small proportion of the total site area. No liability can be accepted for conditions not revealed in exploratory holes, particularly between positions. All extrapolations of available data are given in good faith.

Payment

1 Payment terms are strictly 28 days from the invoice date.

2 Prior to commencement of works, we require receipt of formal written instruction from the party accepting full financial responsibility for the work. In the absence of such an instruction, we would expect the instructing Consulting Engineers/Architects to accept full financial responsibility for the works.

3 Receipt of instruction to commence work shall be taken as acceptance and compliance of the foregoing conditions.

Liability

1. GeoDyne Limited offer £5,000,000.00 Professional Indemnity Insurance (in aggregate over the year). This shall be the limit of our liability for works undertaken. No individual liability shall be implied to, or accepted by, any employee for works undertaken for and on the behalf of GeoDyne Limited.