



E14/6164/JM/007

09th November 2015**F.A.O. Mark Bray**

Persimmon Homes West Yorkshire
3 Hepton Court
York Road
Leeds
LS9 6PW

Dear Sir,

Re: Proposed development off Barnsley Road, Flockton for Persimmon Homes Leeds

Gas testing was undertaken at the above development to confirm if elevated gases were present due to the shallow coal seams proven beneath the site.

Three boreholes were constructed and installed with gas monitoring standpipes and lockable covers. The standpipes were backfilled with single size gravels and sealed with bentonite.

Six rounds of gas monitoring have been undertaken by Haigh Huddleston Associates between 17th April 2015 and 23rd October 2015 using a Gas Data LMSxi G3.18.

The results to date are tabulated below:-

Borehole No.	Date	CH4 (%)	CO2 (%)	O2 (%)	Flow (l/hr)	Barometric Pressure (mb)	Water Level (m)	Borehole Depth (m)
BH1A	17.04.15	0.0	3.2	17.8	0.0	1000	-	3.50
	30.04.15	0.0	4.5	17.8	0.0	987	-	
	15.05.15	0.0	4.3	14.8	0.0	997	-	
	19.08.15	0.0	3.6	17.2	0.0	993	-	
	08.10.15	0.0	3.8	16.2	0.0	997	-	
	23.10.15	0.0	4.0	16.3	0.0	993	-	
BH2A	17.04.15	0.0	5.3	14.2	0.0	1000	2.30	-
	30.04.15	0.0	4.9	18.1	0.0	987	2.35	
	15.05.15	0.0	4.6	15.8	0.0	997	2.30	
	19.08.15	0.0	4.0	15.0	0.0	993	2.30	
	08.10.15	0.0	5.6	2.0	0.0	997	-	
	23.10.15	-	-	-	-	-	-	
BH3A	17.04.15	0.0	3.9	16.4	0.0	1000	-	3.45
	30.04.15	0.0	3.1	18.7	0.0	987	-	
	15.05.15	0.0	4.5	15.3	0.0	997	-	
	19.08.15	0.0	2.1	18.7	0.0	993	-	
	08.10.15	-	-	-	-	-	-	
	23.10.15	0.0	2.5	19.2	0.0	993	-	



As the boreholes were constructed in fields containing crops, it was not possible to take readings from boreholes 2A and 3A on separate occasions, as the monitoring points were damaged by farm machinery during harvesting.

The gas monitoring was undertaken over a range in barometric pressure between 987mb and 1000mb.

No methane concentrations were detected on site. Carbon dioxide values were found between 2.1 and 5.6% with oxygen levels between 2.0 and 19.2%. Flow rates have consistently been 0.0l/hr.

Discussions

The site investigation report has confirmed that no Radon protection measures are required for the site.

The gas risk assessment is based on a high sensitivity end use. Indications show that based upon the NHBC traffic light system in conjunction with CIRIA C665, the GSV value corresponds to the site being characterised as **Green**. The GSV value is obtained by multiplying the maximum gas concentration by maximum borehole flow rate
i.e. Carbon Dioxide - $0.056 \times 0.0 = 0.00$ l/hr.

Due to the consistent levels of carbon dioxide found on site and the potential for the long term build-up of carbon dioxide beneath the ground floor slab it would be prudent for the site to be characterised as **Amber 1**.

Consulting BS 8485:2007 Table 3, we would recommend the following be used on site to achieve a score of 3.5:

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|--|-------------------|
| • Suspended Slab floor construction with a fully vented minimum 150mm deep void. To be increased to 225mm where the proximity of trees affect the foundation construction. | 2.5 Points |
| • Continuous membrane across the cavity/party walls. | 0 Points |
| • Cavity tray in the external walls. | 0 Points |
| • Fully sealed service entries and ducts to manufactures specification. | 0 Points |
| • Beam and block floor slab | 0 Points |
| • A Visqueen Low Permeability gas resistant membrane to be installed to approved levels of workmanship and independently inspected. | 1.0 Point |
| Total | 3.5 Points |



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We hope that the above is sufficient for your requirements. However, should you have any queries please do not hesitate to contact me direct.

Yours sincerely,

JAMIE McBRIDE

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