GROUND GAS PROTECTION MEASURES

frequently asked questions

Breckland COUNCIL

Breckland Council has produced this booklet to assist developers and their agents in satisfying conditions placed on their planning permission relating to the installation of ground gas protection measures. It is intended to give a brief introduction to the subject, and to address a number of questions our officers are routinely asked.

Please Note: Breckland Council is not able to design a gas protection system for you. You will need to seek the advice of a specialist contractor.

This leaflet may be of use to you if you have a condition which says that you must install ground gas protection measures, or if you have an informative note which suggests that you may wish to consider installing ground gas protection measures.

This leaflet does not constitute advice, guidance or design. Specialist advice should always be sought by the developer on a site by site basis.

Question One

What is ground gas?

Ground gas usually refers to carbon dioxide and methane. These are both produced by the breakdown of organic material by micro-organisms. Methane and carbon dioxide are often associated with landfill sites. However, this is not the only source. Other sources of these gases can include:

- Backfill or made ground containing biodegradable organic material.
- Wetlands or soils with a high organic content such as peat.
- Inert fills such as ash or foundry sands.
- Soil gas migrating from a nearby source.

In line with current Government policy to direct development towards previously used sites, developments are increasingly being located on or close to sites with the potential to emit ground gas.

Gas migration from such sites, or exposure to the source due to construction activity, can result in the release of unacceptable volumes of gas; which can have an adverse effect on a development.

Therefore, where an application for development is received for land within close proximity of a potential source of ground gas, the Council must be satisfied that the developer has taken account of the possibility that gas may migrate and affect their development. The Council currently checks all applications for development to establish whether or not the development site falls within 250 metres of land with the potential to exude gas.

We do this using a database provided by the Environment Agency indicating all known landfill sites (whether open or closed) within the district. The Council also has available historical data taken from Ordnance Survey mapping from which potential areas of filled or made ground can be identified.

Question Two

Why has this condition been placed on my planning permission?

In order to protect future development, the Council takes the stance that all land with the potential to release gas should be treated the same. Therefore, unless adequate information is available to remove any concerns surrounding a particular site, the worst case scenario will be considered.

Unless there is evidence to the contrary, the potential for gas to migrate to the development site at unacceptable levels will be assumed. Where considered appropriate, applicants may be given the choice between undertaking a risk assessment / site investigation or installing gas protection measures to a specification which satisfies the Council. Conditions such as this will be restricted to applications where the risk from ground gas migration is considered to be low but unquantified. It is for this instance that we have prepared this leaflet.

It should be noted however, that this option is only provided in the hope of reducing any financial or time constraints likely to be experienced by the developer.

Gas protection measures should only ever be used after the gassing regime has been characterised and it has been confirmed that the gas protection measures are indeed appropriate. Therefore, developers choosing to install gas protection measures, rather than to undertake gas monitoring, must accept that the gas protection measures required will be reasonably onerous and could quite possibly be considered extreme or unnecessary if gas monitoring was actually undertaken on the development site.

Question Three

Why are gas protection measures required in my extension when the main house and neighbouring houses were constructed without any protection?

With the introduction of new legislation and a greater understanding of ground gas risks, local authorities are requesting gas protection measures for all developments potentially at risk. Your house may have been built without such measures at a time when landfill gas may have not been perceived as a potential risk. The introduction of Part IIA of the Environmental Protection Act

1990 on 1 April 2000, places a duty on the local authority to inspect its area for contamination. It is therefore looking at mitigating potential risks at the development stage in greater detail than was previously undertaken. As such, a much stricter approach is taken for contaminated land. Where it is deemed that the property may be at risk from landfill or ground gas, then certain conditions may be imposed by the relevant enforcement authority. You may also find that money lenders and potential purchasers will require similar works. In such cases it could be prudent to seek advice from a specialist as to whether gas protection measures should be incorporated to protect the original property. However, this will not be covered by the planning condition.

Question Four

So what are gas protection measures?

Gas protection measures are used to interrupt possible gas migration pathways. In this leaflet we are considering 'passive' measures, which rely on creating a permeability difference between the property and areas where gas can vent to the atmosphere (such as via a sub-floor void), and using a low permeability barrier within the building.

Question Five

How much will this all cost?

It is not possible for Breckland Council to put a specific cost on the changes required to your existing design to comply with your planning condition. The exact details of the gas protection system to be adopted are your choice, but must be suitable for the conditions at the location. You should seek the advice of your architect or agent and, if required, designers of gas protection systems. The cost of a typical membrane has been compared to the cost of a carpet. A membrane alone is not sufficient and dependent on the choices made by you and your designers, the cost of providing sub-floor venting will vary depending on the original design specification. However, for small sites, the cost of installation is usually significantly less than the cost of a ground gas survey.

Question Six

What information do I need to submit in order to discharge this condition?

You will need to provide information about what will be installed within your development in order to mitigate the risks of potential ground gas ingress. We are happy to accept standard details and Building Research Establishment

paper 414 does include some standard details which may be appropriate for your development. Alternatively, standard details are often available from the manufacturer. In most instances, people choose to get these drawn up onto the working drawings by their architect or structural engineer so that there can be no confusion once on site. In addition, the full specification of the membrane you propose to use and your assurance that it will be installed in accordance with the manufacturer's instructions is also required.

Question Seven

How do I find out how to design basic ground gas protection measures?

There is a wealth of current and emerging guidance relating to ground gas protection measures at the time of writing. Information is available from manufacturer's standard details, the Building Research Establishment Paper No 414 and the NHBC / RSK document 'Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present, Appendix E', may also be of use. Current CIRIA document C659 (soon to be reissued as C665) requires a minimum of two levels of protection in basic gas protection measures. In the majority of cases this will comprise a vented sub-floor and a membrane. Whichever you choose, it must be in accordance with best practice at the time of submission and be suitable for the development.

Question Eight

Does this mean I have to have a suspended (block & beam/ pot & beam) floor?

No, a cast in-situ slab can still be used, but there does need to be a ventilated layer under the slab. There are many ways in which this can be achieved, with either a proprietary 'void former' or a 'granular blanket'. Further information on this is given in BRE414.

Question Nine

I am confused over the installation of the membrane. What pointers can you give me?

The table on page 7 sets out our minimum and preferred requirements relating to membrane installation.

Even a very small (nail sized) puncture of a membrane can render it useless, therefore the installation is vital. Make sure the site is ready for laying the membrane (swept clean etc.) and ensure it is fitted in line with the manufacturer's instructions. This is vital for it to work properly.

Question Ten

Is there some form of installation checklist or guidance that I can give to my builder to assist in the installation?

The NHBC / RSK document contains a checklist for installation, and BRE414 has a series of 'watch points' for each scenario. In addition, a number of local authorities have produced guidance on how to install gas proof membranes which can be downloaded from the internet. Breckland Council has not replicated this work. You may also wish to seek the advice of your Building Control Inspector.

Question Eleven

What about an alarm system instead?

Gas alarms are triggered when a certain concentration of ground gas is present. They are generally only used as an additional protection for high risk sites where a building has been constructed without suitable protection measures. They can require a lot of maintenance and costs are usually high. Systems such as gas alarms that require maintenance are unlikely to be approved for use in private residential housing developments. If you feel that the risk at your location is such that you wish to install a gas alarm then you should undertake detailed ground gas monitoring instead.

Question Twelve

Can the Council give me a specification?

No, you need to provide this based on your design preference. Most people use their building designers to assist or seek advice from the manufacturer of the gas protection system.

Question Thirteen

I would rather have a survey—how do I do this?

You are advised to contact a specialist (you could try word of mouth or trade directories such as yell.com searching for 'site investigation' in 'East Anglia' as a starting point). Further information can be found in our leaflet 'Contaminated Land—Planning Advice Notes'.

Question Fourteen

My condition states the measures must match those already existing at the property. How do I know what is already there?

In many instances, information may be contained in the deeds to your property. Alternatively, you should try the planning file from the original development, or contact your builder for further information.

Question	Prefer	Accept	Definitely Not
Type of membrane?	British Board of Agreement Certification	Manufacturer's rated gas resistant membrane	Cross floor Damp Proof Membrane
Who can install it?	Installation by experienced professionals	Self installation of membrane inspected by Building Control	
It comes on a roll. How is it joined?	Welded membrane	Taped and lapped to designer's/manufacturer's instructions	Laid and overlapped
How do I store the rolls?		Good condition membrane stored appropriately on site	Damaged membrane
What about water / gas / sewage connections?	No penetration by services	Minimum penetration by appropriately sealed service points using manufacturer's proprietary system (top hats for example)	Unsealed service pipes or "a bit of tape around the pipe"
Does anyone need to inspect the installation?	Supplier/ building inspector to be present when screed is poured over membrane	Covered by screed as soon as possible following inspection	No inspection prior to floor being laid. Membrane laid and left such that rips or tears may develop, the laying of pipes on membrane or the use of nails immediately on the screed
What about the cavity wall?		Gas proof, damp proof course suitably joined to membrane which is across the cavity wall (a cavity drip tray will be required) Membrane should pass under internal walls	Unprotected cavity

Question Fifteen

Where do I need to send this information in order to discharge my condition?

You should submit this information to Development Control who will ensure that the relevant people within the Council are consulted. Protection measures are generally site specific and designed to ensure that gas does not enter the building or detrimentally affect its occupants. It is strongly recommended that you submit your design well in advance of the planned start of construction to allow for any modifications which may need to be made. If you have any further questions prior to submitting your initial design, in the first instance you should contact your Development Control Officer.

Some useful references:

CIRIA C659 / 655 (2006) Assessing risks posed by hazardous ground gases to buildings (www.ciria.org)

NHBC / RSK Group PLC (2007) Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present (free to download from www.nhbcbuilder.co.uk/Buildersupportservices/ Technicaladvicesupport/Publications/GroundGases/)

BRE 414 (2001) Protective measures for housing on gas –contaminated land (020 7505 6622)

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