Soils Limited Guide to Soil Gas Management:

Soil gases posing risks to health or safety can include explosive gases (such as methane or natural gas), asphyxiant gases (such as carbon dioxide) or a variety of other toxic or odorous gases. Sources can include natural processes (e.g. anaerobic sediments), man-made processes (e.g. landfill gas) or result from contamination (e.g. due to decomposition of organic contaminants). Consequences of a lack of recognition or management can be severe, yet informal guidance on the assessment and management of such gases only became available in the 1980s, and formal guidance (from CIRIA) only became available in the 1990s.

The last year has however seen publication of two new guides – the generic British Standard BS 8485 "Code of practice for the characterisation and remediation from ground gas in affected developments" and the National House Building Council's "Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present", which is more specific to house-building.

Both documents take a similar approach.

- First they describe the current state of the art in ground gas detection and assessment. It is critical that ground gases are correctly identified and quantitated, and in particular that 'worst case' flow rates are correctly determined, since this data is the basis both of the risk assessment and of choice of appropriate controls.
- A detailed quantitative risk assessment must then be carried out. Meteorological conditions, tidal effects, geology, vegetation and of course the precise form of development planned must all be taken into account. Here the documents differ somewhat. The BS, which aims to apply to all sorts of development, uses a careful mathematically calculated approach. The NHBC document has already assumed residential development and done the basic maths common to all sites with that assumption, so is able to present a simplified 'traffic light' approach.
- The result in both cases are bands of risk ranging from none to high, each band being given a recommended level of gas protection required.
    - Low risk = characteristic situation 1 = NHBC Green (no control required)
    - Medium risk = CS 2 and 3 = NHBC Amber 1 and 2 (control levels 1-4)
    - High risk = CS 4, 5 and 6 = NHBC Red 6 (control levels 3-7)
- Finally the recommended management controls are described and assigned a control level, the sum of which levels should comply with the risk assessment. For example a basic sub-floor ventilation system or a gas membrane might each provide level 1 control alone (and hence provide level 2 protection when used together), whereas a ventilated basement built to Building Regulations is deemed to offer control to level 4.

Each of the above steps requires specialists with appropriate qualifications and experience. Gas control is usually the responsibility of the local authority environmental health officer, and these are now fully aware of the dangers possible when gas is not properly assessed and mitigated. Old-fashioned spike surveys are no longer adequate, and proper gas monitoring wells usually need to be installed and the gas composition and flow-rate assessed on multiple occasions. The data then needs to be expertly assessed and interpreted. The subsequent risk assessment also requires an appreciation of the significance of small details of site geology and proposed building design and occupancy. Finally the recommended solution(s), once agreed and installed, can rarely be changed or improved on, so must be right first time.

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