

Paul Graham/Jonathan MacKenzie  
Butek Landline

Dear Sirs,

## **ASSESSMENT OF PROPOSED GAS VENTING PERFORMANCE FOR SELWOOD, SOUTHAMPTON**

### **Introduction**

MM-EC Ltd was commissioned to carry out gas venting performance calculations for Selwood HQ comprising a L-shaped new building. In carrying out our assessment of the gas protection requirements MM-EC Geoenvironmental Ltd were provided with a copy of the gas monitoring data collected by others.

It is understood the gas protection measures proposed on the above site include the construction of a full geocomposite vent blanket which will be vented via 23No ground level vents around the perimeter edge of the building.

For current purposes the assessment has considered the footprint area of the building to be 1227m<sup>2</sup>.

A summary of the assumptions made within the calculations are provided below:

- The respective floor plan area of the block = 1227m<sup>2</sup>
- We have assumed a maximum methane concentration of 86.3% by volume and a gas flow of 1 l/hr for the design calculations based on monitoring data provided. It should be noted that actual gas flow values were all <0.1l/hr.
- For design purposes we have adopted a target concentration for methane in the passive ventilation layer of 1.00%
- It is proposed that the property will be constructed with a 25-27mm deep geocomposite vent blanket vented via 23No 150mm ground level vents. It has also been assumed that the connecting pipework/manifold pipes are 100mm diameter. The height of the vents for the purpose of the calculation have been assumed to be 1mm above external ground surface.
- The pressure coefficient driving air movement has been assumed to be 0.6Pa.
- A calculation sheet is provided



The respective calculation indicates the ventilation capacity of the proposal will minimally provide 178% of the required ventilation to maintain methane concentrations below 1.00% beneath the footprint area of the building.

We trust the enclosed meets with your current requirements. Should you wish to discuss any matters arising please do not hesitate to contact us.

Yours sincerely

A handwritten signature in black ink, appearing to read "Scott McGregor", written in a cursive style.

**Scott McGregor**  
**Director**



## APPENDIX A- BLOCK SKETCH





## APPENDIX B- VENT PERFORMANCE CALCULATION

Methodology for the design of gas protection measures

Reference has been made to the following documentation in the conception of gas protection  
BS 5925: 1991 Code of Practice for Ventilation principles and designing for natural ventilation  
CIRIA Report 152 Risk Assessment for methane and other gases from the ground  
CIRIA Report 130 Methane: Its Occurrence and Hazards in Construction  
CIRIA Report 131 The Measurement of Methane and other Gases from the ground  
CIRIA Report 149 Protecting Development from methane  
CIRIA Report 659 Assessing Risks Posed by Hazardous Ground Gases to Buildings  
DETR Research Report 'Passive venting of soil gases beneath buildings

| Details to be completed for each assessment |                      |
|---------------------------------------------|----------------------|
| Project Title:                              | Selwood, Southampton |
| Project No:                                 | MM13711              |
| Completed by:                               | Scott McGregor       |
| Date:                                       | 26-May-26            |
| Design Gas:                                 | Methane              |
| Maximum Concentration:                      | 86.3% by volume      |
| Target Concentration:                       | 1.00%                |

Prepared by:

Date:

07-Jun-26

Scott McGregor



Checked by:

Date:

07-Jun-26

David Moore

Site Name **Selwood, Southampton**

Contaminant Gas

Target concentration  $C_T$

|         |
|---------|
| Methane |
| 0.01    |

| Input Parameters                   | Variable     | Value    | Unit                              | Source of parameter value, or formula                                  |
|------------------------------------|--------------|----------|-----------------------------------|------------------------------------------------------------------------|
| Gas Flow                           | $G_F$        | 1        | l/hr                              |                                                                        |
| Flow from borehole                 | $F_R$        | 2.78E-07 | m <sup>3</sup> /s                 | Flow (l/hr)/( 60*60*1000)                                              |
| Gas Concentration                  | $G_c$        | 0.863    |                                   |                                                                        |
| Area of Influence                  | $I_A$        | 10       | m <sup>2</sup>                    | Peckson, 1986 - CIRIA Report 149                                       |
| Emmision Rate                      | $q$          | 2.4E-08  | m <sup>3</sup> /m <sup>2</sup> /s | Flow from Borehole*Gas Concentration/Area of Influence                 |
| Equilibrium gas concentration      | $C_E$        | 0.01     |                                   | Target Concentraion                                                    |
| Rate of Airflow for Equilibrium    | $Q$          | 2.37E-06 | m <sup>3</sup> /m <sup>2</sup> /s | $Q = q ((1 - C_E) / C_E)$ BS5925:1991, Appendix B, equation (9), pg.29 |
| Area of Building Footprint         | $A$          | 1227     | m <sup>2</sup>                    |                                                                        |
| Rate of Flow for Building          | $Q_T$        | 0.002912 | m <sup>3</sup> /s                 | $Q_T = Q * A$                                                          |
| Assumed Wind Speed                 | $U_{50}$     | 4        | m/s                               | Figure 5, BS 5925:1991, pg.20                                          |
| Ratio for 80% Wind                 | $R$          | 0.46     |                                   | Table 9 (exposed (0.56),sheltered (0.46)), BS5925:1991, pg.19          |
| Wind Speed 80% of time             | $U_m$        | 1.84     | m/s                               | $U_m = U_{50} * \text{Ratio}$                                          |
| Constant                           | $k$          | 0.35     | Urban                             | Constant depending on terrain. Table 8, BS5925:1991,pg.19              |
| Constant                           | $a$          | 0.25     | Urban                             | Constant depending on terrain. Table 8, BS5925:1991,pg.19              |
| Height of Vents Above Ground Level | $Z$          | 0.001    | m                                 |                                                                        |
| Wind Speed at Height of Vents      | $U$          | 0.114521 | m/s                               | $U/U_m = kZ^a$ (BS5925:1991, Equation 5,pg.18)                         |
| Surface 'A' (Vent Inlet)           | $S_A$        | N/A      | Pa                                | BS 5925:1991, Table 13,pg.38                                           |
| Surface 'B' (Vent Outlet)          | $S_B$        | N/A      | Pa                                | BS 5925:1991, Table 13,pg.38                                           |
| Pressure Coefficient               | $\Delta C_p$ | 0.6      | Pa                                | $\Delta C_p = 'A' + 'B'$ (0.6Pa stated in Gasflow 25 data sheet)       |

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07-Jun-26

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Date:

07-Jun-26

Summary Table Selwood, Southampton

|              | $A_{inlet}$ | $A_w$       | $C_d$ | $Q_w$ (individual) | No of Strips | $Q_w$ (Total) | $Q_T/Q_w$ |
|--------------|-------------|-------------|-------|--------------------|--------------|---------------|-----------|
| Airbrick     | 0.006       | 0.004242641 | 0.61  | 0.0002296          |              | 0.0000        | #DIV/0!   |
| Vent Box     | 0.0353      | 0.024960869 | 0.61  | 0.0013507          |              | 0.0000        | #DIV/0!   |
| 100mmØPipe   | 0.0063      | 0.004454773 | 0.61  | 0.0002411          | 23           | 0.0055        | 0.53      |
| 110mmØPipe   | 0.0095      | 0.006717514 | 0.61  | 0.0003635          |              | 0.0000        | #DIV/0!   |
| 150mmØPipe   | 0.01767     | 0.012494577 | 0.61  | 0.0006761          | 23           | 0.0156        | 0.19      |
| 165mm Void   | 3.34        | 2.361736649 | 0.61  | 0.1277976          |              | 0.0000        | #DIV/0!   |
| Gasflow 6mm  | 0.0132      | 0.00933381  | 0.61  | 0.0005051          |              | 0.0000        | #DIV/0!   |
| Gasflow 12mm | 0.0066      | 0.004666905 | 0.61  | 0.0002525          |              | 0.0000        | #DIV/0!   |
| Gasflow 12mm | 0.0264      | 0.018667619 | 0.61  | 0.0010101          |              | 0.0000        | #DIV/0!   |
| Gasflow 25mm | 0.00585     | 0.004136575 | 0.61  | 0.0002238          |              | 0.0000        | #DIV/0!   |
| Gasflow 25mm | 0.0078      | 0.005515433 | 0.61  | 0.0002984          |              | 0.0000        | #DIV/0!   |
| Gasflow 25mm | 0.0162      | 0.01145513  | 0.61  | 0.0006199          | 47           | 0.0291        | 0.10      |
| Gasflow 25mm | 0.0572      | 0.040446508 | 0.61  | 0.0021886          |              | 0.0000        | #DIV/0!   |
| Gasflow 50mm | 0.01485     | 0.010500536 | 0.61  | 0.0005682          |              | 0.0000        | #DIV/0!   |
| Gasflow 50mm | 0.0198      | 0.014000714 | 0.61  | 0.0007576          |              | 0.0000        | #DIV/0!   |
| Gasflow 50mm | 0.030195    | 0.021351089 | 0.61  | 0.0011553          |              | 0.0000        | #DIV/0!   |
| System       |             | 0.095743137 | 0.61  | 0.0051808          | 1            | 0.0052        | 0.56207   |

$Q_w = C_d * A_w * U (\Delta C_p)^{0.5}$  BS 5925:1991, Section A, Table 11

$Q_T/Q_w$  limiting factor

Notes

$A_{inlet}$  = the open void area of the vent components supplied by Landline Ltd

$A_w$  = the effective equivalent area of single opposing vent components

$C_d$  = 0.61 constant

$Q_w$  (individual) = the calculated ventilation rate for single opposing vent component sets

No of Strips = Input column for either number of components or ventilation provided by a number of component sets

$Q_w$  (Total) = Provide total ventilation rate for individual components (when 1 inserted in previous column) or for total system when total number of components inserted

$Q_T/Q_w$  = Rate of flow required to maintain target gas levels divided by rate of flow provided by system (#DIV/0! = N/A)

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