

Ref: 50-194-TN2-3  
Date: 15th August 2024

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BY Email

## **TECHNICAL NOTE ON NOISE FOR CONDITIONS 10 AND 11 LISTED BUILDING EXTENSION, LAYSTALL STREET, MANCHESTER**

### **1. BACKGROUND & OBJECTIVES**

E3P have been commissioned to produce a Noise Impact Assessment (50-194-R1-3) dated February 2021 for the proposed development at Laystall Street in Manchester. It is understood that since planning permission was granted, an extension to the listed building is proposed along with a new ventilation and heating/cooling strategy is proposed for this building which now includes Air Conditioning Units.

As such, the Environmental Health Department have requested consideration of noise impact from these units as well as existing noise upon the proposed extension and, in particular, have requested that the following is achieved:

*Within 3 months of this consent a scheme for any required acoustic insulation for the externally mounted ancillary equipment to the rear of 34 Laystall Street to ensure that it achieves a background noise level of 5 dB below the existing background (LA90) in each octave band at the nearest noise sensitive location shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the equipment. The approved scheme shall be implemented prior to occupancy and shall remain operational thereafter.*



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29) LISTED BUILDING – Prior to the occupation of the office accommodation a scheme for the acoustic insulation of any externally mounted ancillary equipment (including any Mechanical Ventilation Heat Recovery (MVHR) systems associated with the development to ensure that it achieves a background noise level of 5 dB below the existing background (LA90) at the nearest noise sensitive location shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the equipment. The approved scheme shall be completed before the premises is occupied and a verification report submitted for approval by the city council as local planning authority and any non compliance suitably mitigated in accordance with an agreed scheme prior to occupation. The approved scheme shall remain operational thereafter.

Reason – To secure a reduction in noise in order to protect future residents from noise nuisance, pursuant to policies SP1, H1 and DM1 of the Core Strategy.

11) Prior to commencement of development details of the following shall be submitted:  
(a) a scheme for acoustically insulating and mechanically ventilating the residential accommodation against local road traffic network, any local commercial/industrial premises, plant and equipment on adjacent premises and the insulation requirements and specification for plant room service risers /lift shafts; and

The approved noise insulation scheme and mitigation measures shall be completed before any of the dwelling units are occupied.

The following noise criteria will be required to be achieved:

Bedrooms (night time - 23.00 - 07.00) 30 dB LAeq (individual noise events shall not exceed 45 dB L<sub>Amax,F</sub> by more than 15 times)

Living Rooms (daytime - 07.00 - 23.00) 35 dB LAeq

As such, this Technical Note that considers the potential impact of noise from the air conditioning units upon existing/proposed residential receptors in the immediate vicinity in accordance with the above and BS 4142:2014+A1 'Methods for rating and assessing industrial and commercial sound'. An updated Background sound survey has been conducted to inform this Technical Note. Furthermore, an assessment of existing noise sources upon the proposed residential receptors will be undertaken,

The technical note has been completed by Lee Faulkner, Associate Director at E3P, with over 13 years' experience in the measurement and assessment of noise and vibration. I hold the Post Graduate Diploma in Acoustics and Noise Control and I am a full corporate member of the Institute of Acoustics (MIOA).



## 2. BASELINE NOISE LEVELS

### 2.1. UNATTENDED BACKGROUND AND AMBIENT SOUND SURVEY

E3P have undertaken an unattended background and ambient sound survey in a position considered representative of the existing and proposed receptors.

The survey was carried out over the following time period:

- 12:45 Thursday 15th February to 07:00 Tuesday 20th February 2024.

The following noise measurement position was chosen for the Background Sound Survey:

- Noise Measurement Position 1 (NMP1): Located out of a north facing 1st floor window overlooking Laystall Street and considered representative of the proposed noise sensitive receptors. The microphone of the sound level meter was set at a height of 4 m above ground level. and in façade conditions. Sound sources consisted of road traffic on the local road network, specifically Great Ancoats Street.

Table 1 details the measured ambient sound levels. The full data set is available upon request. It is assumed that the office plant items would only operate during the day and so periods between 07:00 and 19:00 are assumed. A correction of -3 dB is applied to correct to free-field.

TABLE 1 MEDIAN AND RANGE OF MEASURED AMBIENT SOUND PRESSURE LEVELS

| DATE                           | TIME PERIOD | RANGE OF MEASURED<br>AMBIENT SOUND<br>PRESSURE LEVELS,<br>$L_{Aeq,T}$<br>(dB) | MEDIAN MEASURED<br>AMBIENT SOUND<br>PRESSURE LEVELS,<br>$L_{Aeq,T}$<br>(dB) |
|--------------------------------|-------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Friday 15th February<br>2024   | 07:00–19:00 | 51.3-57.9                                                                     | 53.9                                                                        |
| Saturday 16th February<br>2024 | 07:00–19:00 | 52.0-60.2                                                                     | 54.2                                                                        |
| Sunday 17th February<br>2024   | 07:00–19:00 | 50.4-58.2                                                                     | 54.5                                                                        |
| Monday 18th February<br>2024   | 07:00–19:00 | 49.7-53.4                                                                     | 52.3                                                                        |

The worst case measured 16 hour and 8-hour noise levels were noted to be 64 dB during the day (as measured on Friday, Saturday and Monday) and 62 dB during the night (as measured on Saturday night).

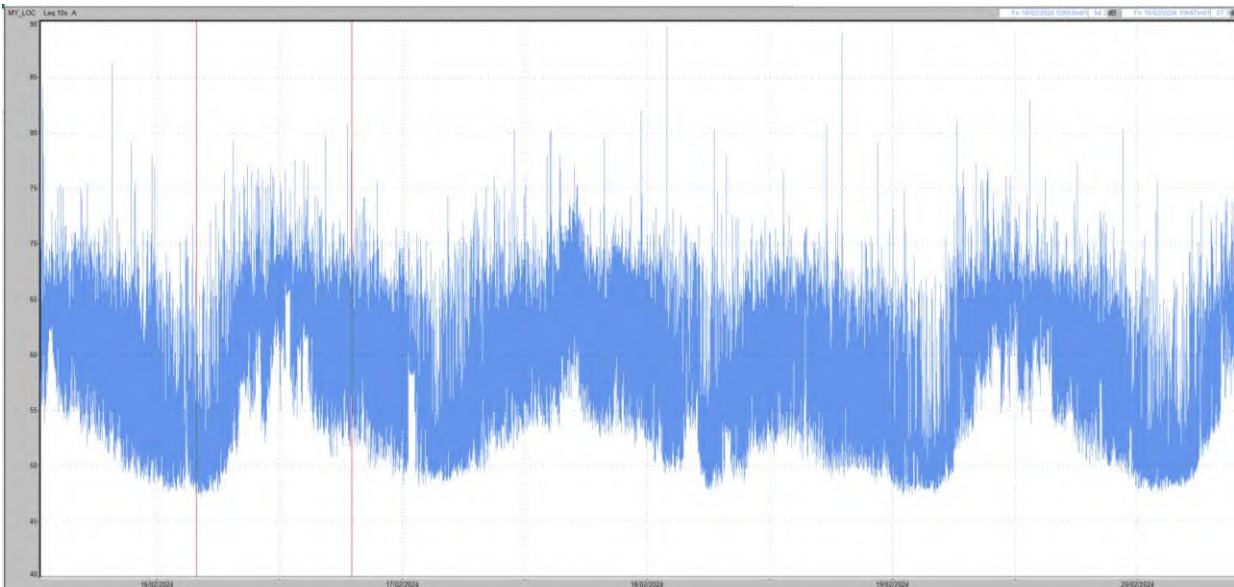
The time history graph is shown below:



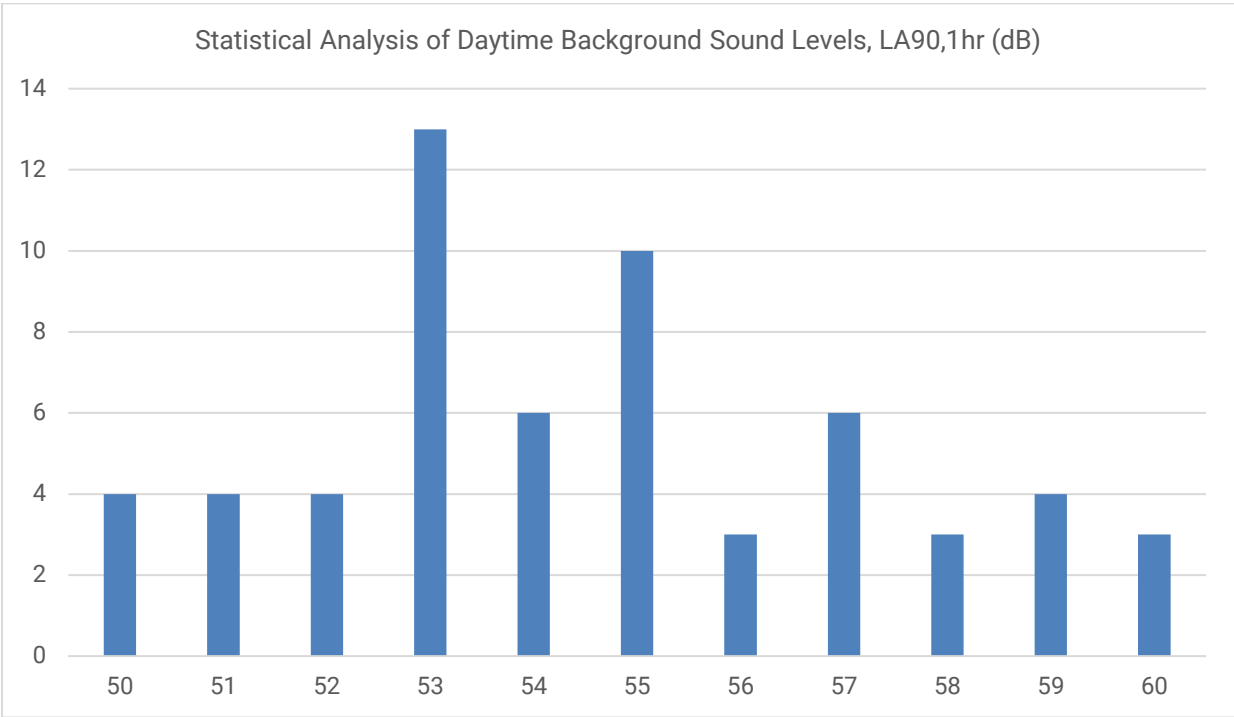
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The graph below provides a statistical analysis of the measured daytime background sound levels.



As can be seen, a background sound level of 53 dB is considered most appropriate and typical for use in the assessment. The level highlighted bold above are the lowest measured levels to be used in the assessment to inform a worst-case assessment.



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Considering the location of the NMP and that the receptors in question are shielded from Great Ancoats Street and following comments received from MCC, an additional attended survey has been conducted as below.

## 2.2. ATTENDED BACKGROUND AND AMBIENT SOUND SURVEY

E3P have undertaken an attended background and ambient sound survey in a position considered representative of the proposed receptors. As the development, and surrounding sites, are under construction, attended measurements during typical daytime periods was not possible. As such, E3P attended during the following periods:

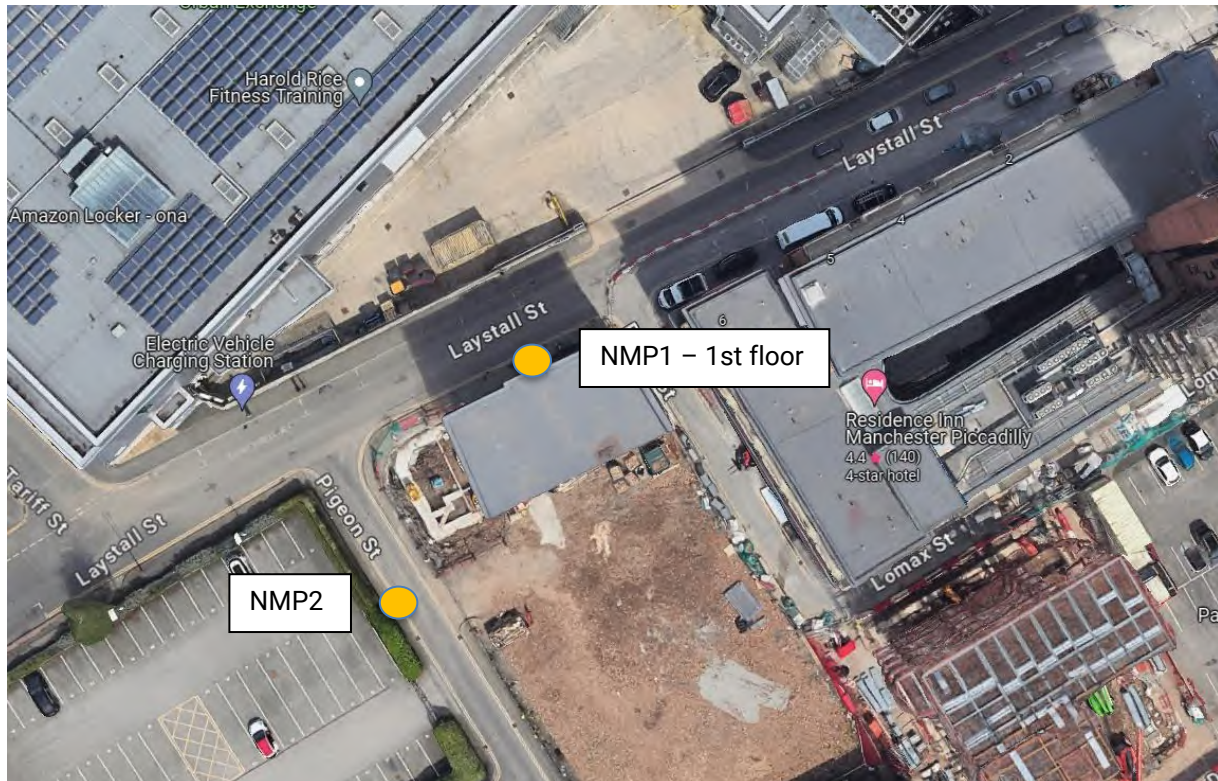
- Tuesday 11th June 2024 17:45 to 19:00.

The following noise measurement position was chosen for the Background Sound Survey:

- Noise Measurement Position 2 (NMP2): Located to the immediate south of the development site, behind the existing building and hoarding of the development site with Great Ancoats Street fully shielded from the position. The microphone of the sound level meter was set at a height of 1.5 m above ground level and in free-field conditions. Sound sources consisted of road traffic on the local road network.

Picture 1 below shows the measurement positions:

PICTURE 1 NOISE MEASUREMENT POSITIONS



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Table 2 details the measured ambient and background sound levels. Traffic along Laystall Street were dominant for the average ambient noise levels but traffic was intermittent with distant Great Ancoats Street noise the dominant background sound.

TABLE 2 MEASURED AMBIENT AND BACKGROUND SOUND PRESSURE LEVELS

| MEASUREMENT START TIME | MEASURED AMBIENT SOUND<br>PRESSURE LEVELS, $L_{Aeq,T}$<br><br>(dB) | MEASURED BACKGROUND<br>SOUND PRESSURE LEVELS, $L_{Aeq,T}$<br><br>(dB) |
|------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------|
| 17:45                  | 58.5                                                               | 48.9                                                                  |
| 18:00                  | 59.6                                                               | 48.8                                                                  |
| 18:15                  | 59.8                                                               | 48.3                                                                  |
| 18:30                  | 58.7                                                               | 48.5                                                                  |
| 18:45                  | 58.1                                                               | 47.8                                                                  |

The lowest measured 15-minute noise level is used to inform the assessment which is 48 dB.

Table 3 details the equipment used in the surveys.

TABLE 3 NOISE MEASUREMENT EQUIPMENT AND CALIBRATION DATES

| MEASUREMENT POSITION | EQUIPMENT DESCRIPTION | MANUFACTURER & TYPE NUMBER | SERIAL NUMBER | CALIBRATION DUE DATE AT TIME OF SURVEY |
|----------------------|-----------------------|----------------------------|---------------|----------------------------------------|
| NMP1                 | Sound Level Meter     | 01dB Fusion                | 12039         | 28/07/2025                             |
|                      | Pre-amplifier         | 01dB Pre22                 | 1805124       |                                        |
|                      | Microphone            | GRAS 40CD                  | 330832        |                                        |
|                      | Calibrator            | Cirrus CR 515              | 87281         | 19/01/2025                             |
| NMP2                 | Sound Level Meter     | Nor145                     | 14529152      | 13th June 2025                         |
|                      | Pre-amplifier         | Nor1209                    | 22293         |                                        |
|                      | Microphone            | Nor1227                    | 332220        |                                        |
|                      | Calibrator            | Nor1255                    | 125525208     | 13th June 2024                         |

The sound level meters were field calibrated on site using the above-mentioned calibrator prior to and after noise measurements were taken. No significant drift was witnessed as noted above. Calibration certificates are available upon request.



### 3. PLANT NOISE IMPACT ASSESSMENT

In order to consider the potential noise impact from the A/C units, E3P have undertaken 3D noise modelling of the units based on information provided by the client, specifically:

- ✳ AC Unit Plan – L00 (L0316).
- ✳ Air Conditioning Technical Data RXM-R – Sound Power Level of 63 dB.
- ✳ Air Conditioning Technical Data RZAG-MV1 – Sound Power Level of 70 dB.
- ✳ Air Conditioning Technical Data ARXM-R – Sound Power Level of 65 dB.

With regard to assumptions for the assessment, the following has been considered for the full planning application aspects:

- ✳ Ground elevations have been taken as existing by way of a 2 m grid Digital Terrain Model (DTM) which contains public sector information licensed under the Open Government License v3.0.
- ✳ The proposed x m high wall is included with 0 dB absorption and set as reflective.
- ✳ Reflection order of 1 allowed for as per CadnaA recommendations; and
- ✳ No soft ground attenuation has been applied.

For the BS 4142:2014+A1:2019 assessments, penalties are applied to the specific sound level in order to provide the rating level. Given that the sources of noise are A/C units and that the receptors are inside, no penalties are applied in this instance as it is assumed that there would be no tonal elements to the noise, nor any intermittency or impulsivity. As such, the output from the noise model can be considered the Rating Level.

Table 4 details the resultant rating level at the closest facades, output from the model. The grid noise map can be seen in Figure 1 of Appendix I.

As discussed, the lowest measured background sound level is applied, in this case 48 dB, to all receptors. This informs a worst-case assessment.

TABLE 4 BS 4142:2014+A1:2019 ASSESSMENT – DAYTIME

| RECEPTOR          | CALCULATED<br>RATING LEVEL, $L_{A,r}$<br>(dB) | BACKGROUND<br>SOUND LEVEL,<br>$L_{A90,1hr}$<br>(dB) | CRITERION,<br>$L_{A,r} = L_{A90} - 5dB$<br>(dB) | DIFFERENCE<br>+/-<br>(dB) |
|-------------------|-----------------------------------------------|-----------------------------------------------------|-------------------------------------------------|---------------------------|
| Existing to East  | 36                                            | 48                                                  | 43                                              | -7                        |
| Proposed to South | 46                                            | 48                                                  | 43                                              | +3                        |



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Table 4 indicates that the predicted rating level falls below the criterion for receptors to the east but exceeds the background for those to the south. As such, mitigation measures are required to protect the receptors to the south.

In addition to the above, E3P also note that the condition requires the above criterion to be achieved in all octave bands. As such, hand calculations have been undertaken based on the supplied information for the units to calculate octave band rating levels at the façade and compare this to the octave band background sound level measured between 07:00 and 19:00 on Monday 5th February which was noted to be the lowest median period.

TABLE 4 OCTAVE BAND ASSESSMENT

|                                                                                 | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1k Hz | 2k Hz | 4k Hz |
|---------------------------------------------------------------------------------|-------|--------|--------|--------|-------|-------|-------|
| <b>RZAG140MV Sound Power Level, <math>L_w</math> (dB)</b>                       | 76    | 69     | 73     | 70     | 62    | 58    | 52    |
| <b>RXM60 Sound Power Level, <math>L_w</math> (dB)</b>                           | 59    | 63     | 62     | 59     | 55    | 49    | 45    |
| <b>ARXM Sound Power Level, <math>L_w</math> (dB)</b>                            | 62    | 68     | 65     | 62     | 58    | 53    | 47    |
| <b>Combined Sound Power Level for all 6 Units, <math>L_{WA}</math> (dB)</b>     | 79.3  | 75.1   | 76.9   | 73.9   | 67.0  | 62.6  | 56.8  |
| <b>Distance to Façade (m)</b>                                                   | 4.6   | 4.6    | 4.6    | 4.6    | 4.6   | 4.6   | 4.6   |
| <b>Line of Sight Removal (barrier) (dB)</b>                                     | -3    | -3     | -3     | -3     | -3    | -3    | -3    |
| <b>Predicted Sound Pressure Level at Receptor, <math>L_{eq}</math> (dB) (A)</b> | 52.0  | 47.9   | 49.7   | 46.7   | 39.8  | 35.3  | 29.6  |
| <b>Background Sound Level, <math>L_{90}</math> (dB)</b>                         | 62.0  | 57.1   | 54.6   | 51.4   | 51.3  | 47.1  | 39.2  |
| <b>Criterion (-5 dB) (B)</b>                                                    | 57.0  | 52.1   | 49.6   | 46.4   | 46.3  | 42.1  | 34.2  |
| <b>Difference, +/- (A-B)</b>                                                    | -5.0  | -4.2   | 0.1    | 0.3    | -6.5  | -6.8  | -4.6  |

As can be seen, there is not exceedance of the criterion in any octave band. The 0.3 dB difference in the 500 Hz band is not considered significant.



## **4. MITIGATION – PROPOSED FIXED PLANT**

As noted in Section 3.0, an exceedance of the MCC criterion, +3 dB, is predicted for proposed receptors to the south. As such, mitigation measures are required.

Accordingly, an additional grid noise map has been run with additional height to the enclosure and additional barriers within the walled area to remove line of sight from the units to the receptors.

The following mitigation is recommended:

- ✧ Walled area increased in height to 2.3 m above ground level.
- ✧ Additional barrier running from existing wall north at a height of 2.3 m. The model has found a barrier that is 1.3 m from the façade of the building is required to reduce noise levels to 43 dB and below.

Figure 2 details the required barriers.



## 5. PROPOSED RESIDENTIAL NOISE IMPACT ASSESSMENT

As well as the proposed sound sources, E3P have considered the existing sound sources that have a potential to impact upon the proposed residential dwellings within the extension.

Accordingly, the worst-case measured façade noise levels have been used to inform the assessment. These were as follows, with a façade correction of -3 dB applied:

- ✧ Daytime average noise level of 61 dB  $L_{Aeq,16hr}$ .
- ✧ Night-time average noise level of 59 dB  $L_{Aeq,8hr}$ .
- ✧ 10th highest maximum noise level of 78 dB  $L_{Amax,fast}$ .

These measured noise levels are assumed at all habitable room windows associated with the proposed residential extension.

Accordingly, the below details the BS 8233 assessment with the aim to achieve the levels stipulated in Condition 11. In order to predict internal noise levels, it is assumed that standard double glazing 4 / 16 / 4 would be installed with a sound reduction of 30 dB  $R_w$ . As road traffic is the main noise source here, the  $+C_{t,r}$  correction is applied resulting in a reduction of 25 dB. As such, the allowable external noise levels are 60 dB during the day and 55 dB (75 dB max) at night. The below details the results

- ✧ Living room and bedrooms during the day – 1 dB in exceedance with standard glazing.
- ✧ Bedrooms at night (average) – 4 dB in exceedance.
- ✧ Bedrooms at night (maximum) – 3 dB in exceedance.

As noted above, standard glazing is not suitable for any habitable room windows on the extension. As such, the following glazing requirements are recommended:

- ✧ Minimum reduction of 34 dB  $R_w$  (30 dB  $R_w + C_{t,r}$ ) – example configuration could be 10 mm glass / 16 mm air space / 4 mm glass.

The above would achieve internal noise levels of 31 dB during the day and 29 dB (44 dB max) at night, all of which falls below the required criteria.

As well as the above, it is important to consider open windows. It is understood that the developer is to install a MVHR system, in accordance with Part F requirements and, as such, windows do not need to be open to achieve the necessary ventilation. The proposed system is understood to be the Vent-Axia Lo-Carbon Sentinel Kinetic CWL Cooker Hooder which acts as a kitchen extract as well as an MVHR system, a copy of specification sheet is appended to the rear of the report.

With regards to Part O requirements, all bedrooms would exceed the internal criteria of 40 dB average and 55 dB max with windows open to mitigate overheating. As such, any overheating assessment would need to account for this. However, E3P note that the MVHR system includes a boost function which could counter this requirement. Windows are to remain openable for purge ventilation and at the users discretion.



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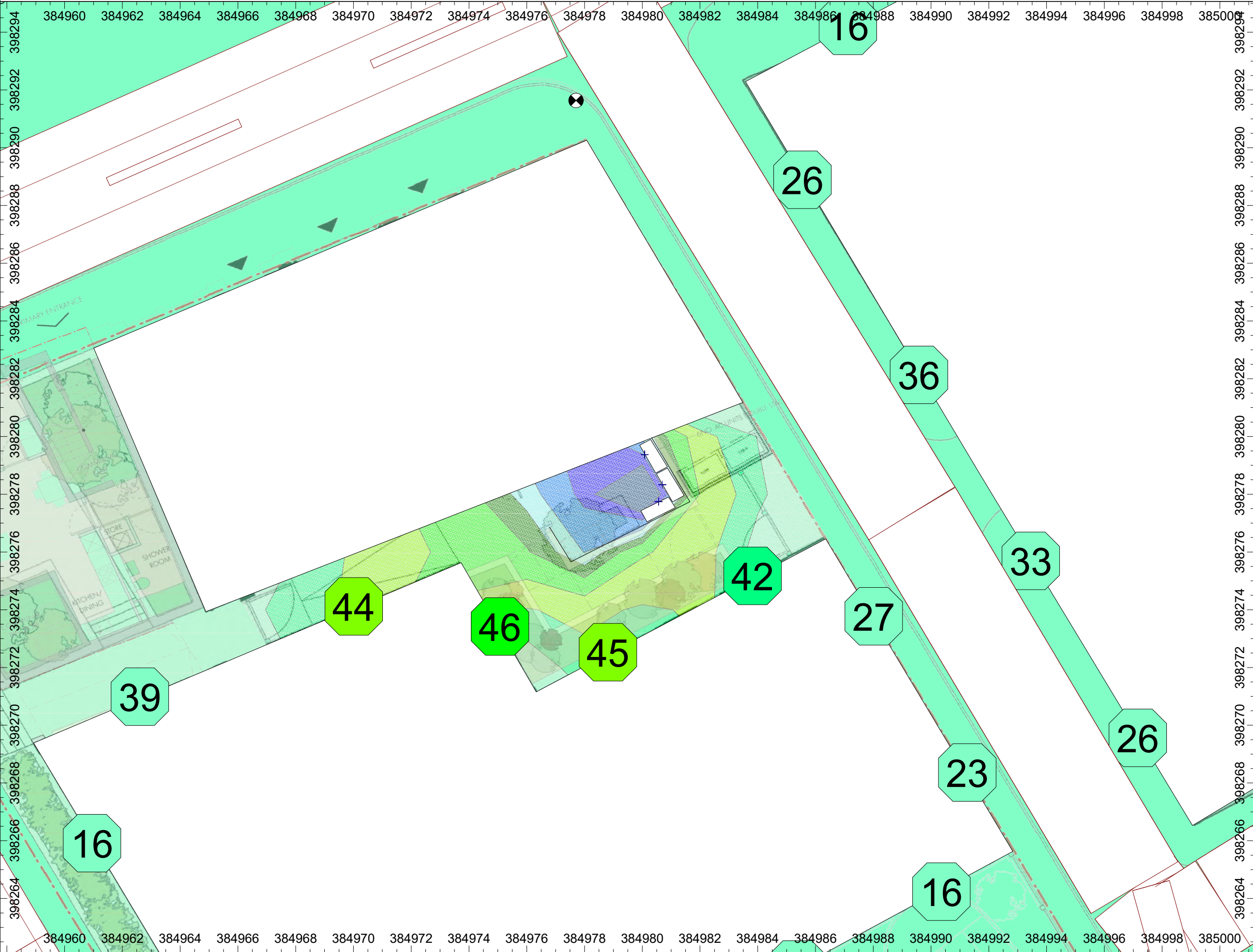
The appended specification sheet also includes noise level data with a maximum break out noise level of 33 dB at 3 m. This level of noise is acceptable within living room/dining rooms which are the closest to the units. Bedrooms are sufficient distance from the unit with no line of sight and levels of below 30 dB are expected to be achieved.

Yours sincerely,  
For and on behalf of E3P Ltd

**Lee Faulkner**  
**Associate Director**



Figure 1 - Daytime Grid Noise Map - Calculation at 1.5m above ground level



**Project:**  
Laystall Street,  
Manchester

**Project-No:**  
50-194

**Client:**  
McCauls

**Rating Level,  
LA,r (dB)**

|          |       |
|----------|-------|
| ...      | <= 40 |
| 40 < ... | <= 42 |
| 42 < ... | <= 45 |
| 45 < ... | <= 48 |
| 48 < ... | <= 50 |
| 50 < ... | <= 52 |
| 52 < ... | <= 55 |
| 55 < ... | <= 58 |
| 58 < ... |       |

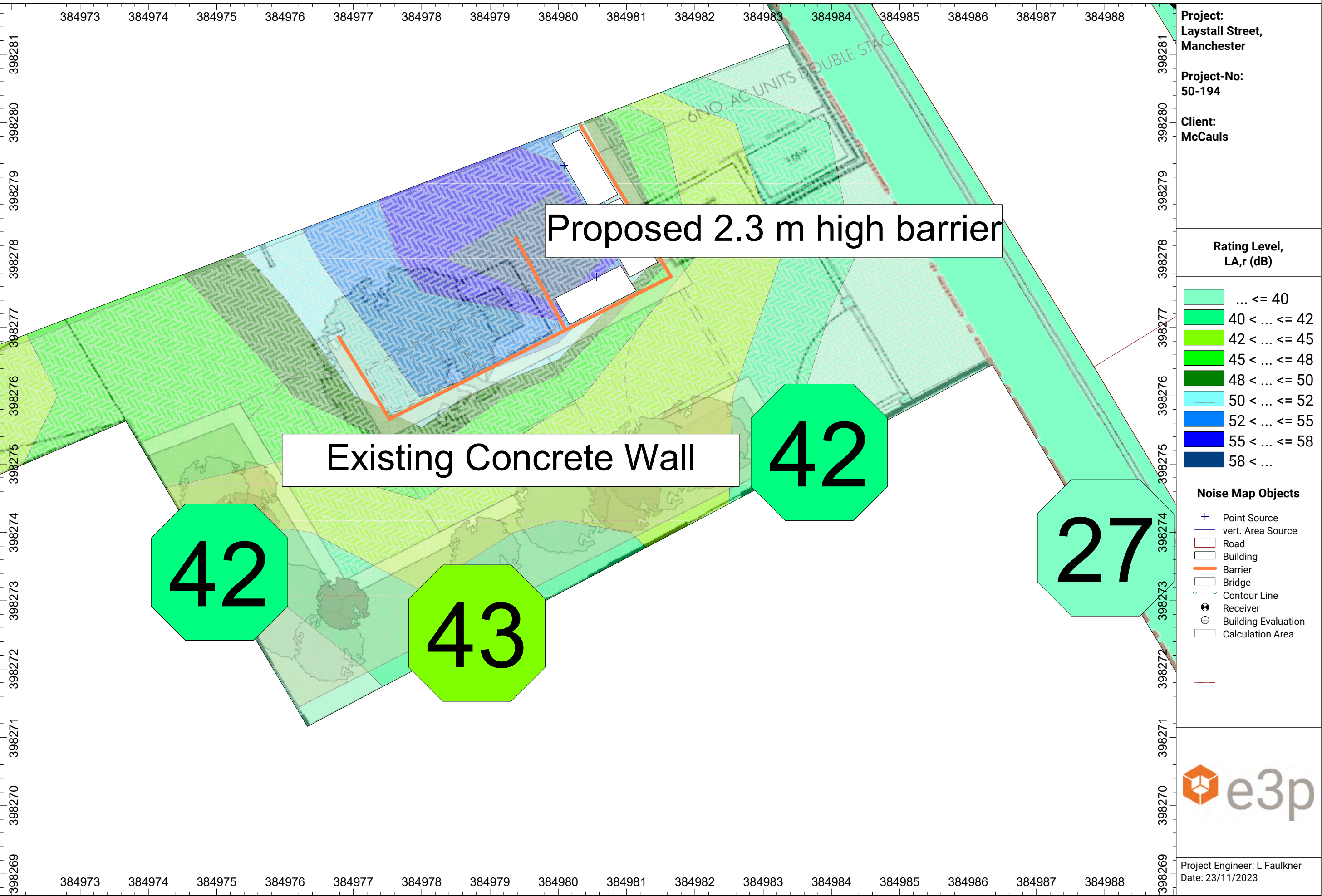
**Noise Map Objects**

- + Point Source
- vert. Area Source
- Road
- Building
- Barrier
- Bridge
- Contour Line
- Receiver
- Building Evaluation
- Calculation Area

**e3p**

Project Engineer: L Faulkner  
Date: 23/11/2023

Figure 2 - Daytime with Mitigation Grid Noise Map - Calculation at 1.5m above ground level



# Lo-Carbon Sentinel Kinetic Cooker Hood

- Acoustic Top Box option for reduced in-duct noise
- Recognised in SAP PCDB
- Includes Cooker Hood Canopy
- Horizontal duct option for space-saving installations
- Fits within a 600mm wide aperture (300mm deep)
- Integrated digital controller for simple and accurate commissioning
- Plug and play controls; Humidistat
- BMS connectivity
- LS inputs (Light Switch)
- Volt-free inputs
- Self diagnosis for simplified fault finding
- Adjustable delay On/delay Off timer



## Easy Installation

Ducting can be attached to the unit horizontally, vertically or both. Minimum internal depth of kitchen cupboard: 300mm.

**Horizontal and Vertical Spigots:** The combination of spigot options allows installation in confined locations. If vertical and horizontal connection are required on the same outlet/inlet, additional spigots can be supplied.

The condensate connection can be taken through the rear of the unit or through the side of the unit into an adjacent cupboard prior to connection into pre-installed domestic waste water system.

## Cooker Hood Unit

The Sentinel Kinetic Cooker Hood is designed to fit in a 600mm wide aperture above a hob. The telescopic hood incorporates two flat removable metal grease filters, low energy light bulbs and is available with a White or Brushed Aluminium front trim.

The hood contains an integral fire damper in accordance with BRE Digest 398 and is connected to the heat recovery unit by a galvanised steel duct with access for cleaning. When the hood is opened, the heat recovery unit goes to boost speed and the summer bypass automatically opens to prevent cooking by-products entering the heat recovery cell. As an additional safety feature, the duct also contains a thermal cut-out fuse which turns off the MVHR unit in the event of excessive temperature in the airway. Cooker Hood units cannot be handed on-site and must be purchased as left hand (L) or right hand (R) models.

## SELV Models

SELV cooker hoods allow the distance between the hood and an electric hob to be reduced from 650mm to 550mm.

## Integral Humidity Sensor

The integral humidity (models with H suffix) sensor increases speed in proportion to relative humidity levels, saving energy and reducing noise. The sensor also reacts to small but rapid increases in humidity, even if

the normal trigger threshold is not reached. This unique feature ensures adequate ventilation, even for the smallest wet room. The night time relative humidity setback feature suppresses nuisance tripping as humidity gradually increases with falling temperature.

## Models

Lo-Carbon Sentinel Kinetic with summer bypass and humidity sensor.

| Model                                        | Stock Ref |
|----------------------------------------------|-----------|
| Kinetic CWH L (White Left)                   | 446756    |
| Kinetic CSH L (Brushed Aluminium Left)       | 446757    |
| Kinetic CWH R (White Right)                  | 446758    |
| Kinetic CSH R (Brushed Aluminium Right)      | 446759    |
| Kinetic CWH L SELV (White Left)              | 477003    |
| Kinetic CSH L SELV (Brushed Aluminium Left)  | 477004    |
| Kinetic CWH R SELV (White Right)             | 477005    |
| Kinetic CSH R SELV (Brushed Aluminium Right) | 477006    |

## Accessories

| Model                                     | Stock Ref |
|-------------------------------------------|-----------|
| Wired Remote Controller                   | 443283    |
| LED Alarm with 15m cable                  | 448356    |
| Opto-coupler for volt-free bms connection | 447340    |
| ISO 45% Coarse (G3) 2x Filter             | 442356    |
| ISO ePM10 50% Pollen (M5) 1x Filter       | 444199    |
| Grease 2x Filter                          | 372774    |
| Acoustic Purge Fan                        | 477988    |
| Acoustic Purge Fan XL                     | 479829    |

## SAP PCDB Test Results

| SAP 2009 |                      |             | SAP 2012             |             |
|----------|----------------------|-------------|----------------------|-------------|
|          | Thermal Efficiency % | SFP (W/l/s) | Thermal Efficiency % | SFP (W/l/s) |
| K+1      | 85                   | 0.72        | 85                   | 0.78        |
| K+2      | 85                   | 0.74        | 85                   | 0.89        |
| K+3      | 84                   | 0.83        | 82                   | 1.03        |
| K+4      | 83                   | 0.92        |                      |             |

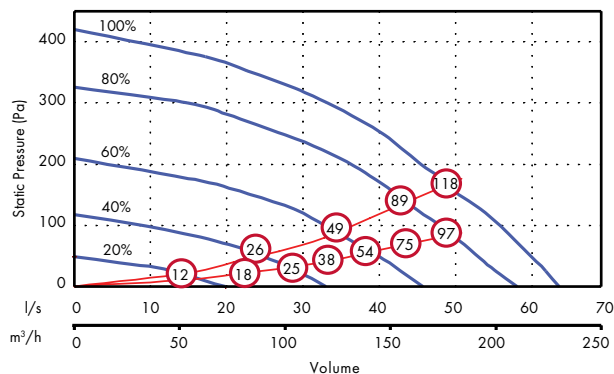
## SEC Class

| Model           | SEC Class |
|-----------------|-----------|
| Kinetic CWH/CSH | A         |

## Performance

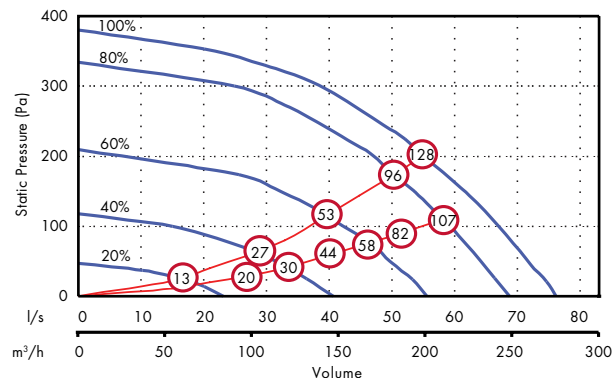
Fan speeds are fully adjustable within the performance range.

Horizontal Spigots



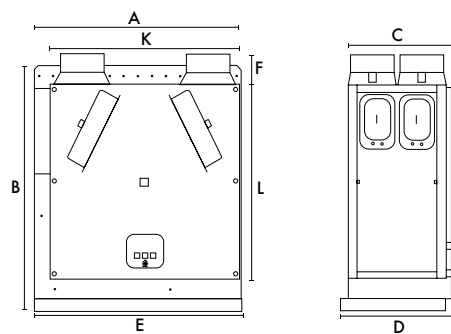
(x) figure relates to Wattage (both motors)

Vertical Spigots



## Dimensions (mm)

Unit

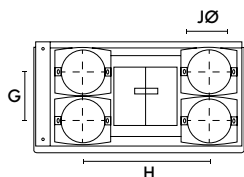


Minimum clearance from the bottom of this unit to the top of the hob must be:

Gas: 750mm

Electric: 650mm/ 550mm

(SELV)



| A   | B   | C   | D   | E   | F  | G   | H   | J   | K   | L   | kg |
|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|----|
| 590 | 710 | 295 | 316 | 598 | 90 | 140 | 360 | 125 | 550 | 550 | 27 |

## Sound Data

| Flow l/s | Test mode | Octave band, Hz, dB SWL |      |      |      |      |      |      |      | SPL dB(A)<br>@ 3m |
|----------|-----------|-------------------------|------|------|------|------|------|------|------|-------------------|
|          |           | 63                      | 125  | 250  | 500  | 1K   | 2k   | 4K   | 8K   |                   |
| 10       | Supply    | 47.8                    | 40.2 | 38   | 31.1 | 28.2 | 22.1 | 23.6 | 30.9 | 21.4              |
|          | Extract   | 47                      | 38.7 | 36   | 29.9 | 25   | 22.4 | 23.3 | 30.8 | 20.6              |
|          | Breakout  | 43.6                    | 36.2 | 37.4 | 30.9 | 27.4 | 23.3 | 24.2 | 31.4 | 18.6              |
| 20       | Supply    | 54                      | 46.6 | 50.2 | 44.5 | 44.4 | 38.3 | 28.8 | 31.9 | 31.2              |
|          | Extract   | 46.8                    | 40.5 | 34.6 | 34.2 | 34.6 | 25.9 | 23.7 | 30.3 | 22.9              |
|          | Breakout  | 45.9                    | 39.9 | 40.6 | 35.7 | 33.5 | 28.4 | 25.3 | 31.2 | 21.3              |
| 30       | Supply    | 58.1                    | 54.5 | 57.6 | 52.2 | 51.7 | 47.6 | 38.6 | 35.8 | 38.5              |
|          | Extract   | 47.6                    | 46.2 | 38.7 | 41.3 | 42.8 | 33.9 | 26.4 | 30.5 | 28.4              |
|          | Breakout  | 45.2                    | 42.4 | 48.2 | 40.8 | 37.7 | 35.2 | 30   | 31.1 | 25.2              |
| 40       | Supply    | 65.2                    | 58.4 | 62.3 | 58   | 56.5 | 52.5 | 44.1 | 41.4 | 43.6              |
|          | Extract   | 53.5                    | 53   | 44   | 47.7 | 48.1 | 39.7 | 31.5 | 31.5 | 33.5              |
|          | Breakout  | 50.9                    | 47.6 | 47.4 | 48.1 | 42.5 | 40.8 | 36.3 | 34.4 | 29.3              |
| 50       | Supply    | 66.4                    | 63.2 | 66.3 | 62.5 | 61.7 | 57.4 | 50   | 47.8 | 48.3              |
|          | Extract   | 64.2                    | 55.2 | 48   | 50.9 | 52.1 | 44.5 | 35.9 | 35   | 37.2              |
|          | Breakout  | 55                      | 51   | 51.3 | 51.6 | 46.9 | 46.0 | 42   | 38.3 | 33.2              |

Tested according to BS EN 13141-7:2010. Breakout quoted spherical. Supply and Extract quoted hemispherical. For in-duct data, end reflections are added based on the spigot size of the unit.

## Consultant's Specification

### Operation

The supply and extract ventilation unit shall be a Sentinel Kinetic as manufactured by Vent-Axia and shall be sized as indicated on the drawings and shall be in accordance with the particular specification.

Supply air to the room shall be pre-heated by the extract air via the integrated composite plastic counterflow heat recovery cell. The Sentinel Kinetic shall automatically vary the ventilation rate via EC/DC motors, as it receives signals from one of the optional interconnected sensors. When a signal is received, the fans shall either vary their speed proportionally or on a trickle and boost principle.

The unit shall have the facility to commission the supply and extract fans individually via in-built minimum and maximum speed adjustment, or alternative wired remote control unit. The fans themselves shall have independent, infinitely variable speed control.

### Unit Specification

The unit shall be manufactured with an ABS outer case construction, and incorporate a metal duct to the cooker hood, intumescent fire damper and thermal switch, in accordance with BRE Digest 398.

The unit shall have a high efficiency composite plastic counterflow heat exchanger, supply and extract filters, automatic summer bypass, integral minimum and maximum infinitely variable speed controls with fascia mounted failure indication. The unit shall have low energy, high efficiency EC/DC fan/motor assemblies with sealed for life bearings. The impellers shall be high efficiency forward curved centrifugal type.

The unit shall have a heat exchanger cell with a thermal efficiency of up to 92% when tested to EN 308. This shall be protected by ISO 45% Coarse (G3) Filter 2pk grade synthetic filters on supply and extract. Complete with a condensate drip tray and drain connection.

The unit shall be constructed with a removable Core allowing full maintenance access. The removable Core shall provide access to the following:

- ✓ Supply and extract filter
- ✓ Heat exchanger
- ✓ Access to the electrical connections

Access shall be provided for wiring termination and setup/commissioning. The backlit LCD user interface therein shall be removable for remote mounting if required.

Units shall be as manufactured by Vent-Axia Ltd.

Sound tested to BS EN 13141-7:2010

### Standard Controls

All Sentinel Kinetic units shall incorporate the following functions integrally mounted, pre-wired and factory fitted by the manufacturer:

- ✓ Integral infinitely variable fan speed control on supply and extract
- ✓ Integral min/max ventilation control/set point
- ✓ Integral BMS interfaces – control and status indication
- ✓ Heating interlocks
- ✓ 0-10V proportional speed adjustment
- ✓ Volt free contacts
- ✓ 24V sensor supply
- ✓ Integral on/off or trickle boost function from remote switch e.g. PIR occupancy detector
- ✓ The unit shall be controlled by the 'Sentinel' control devices (enablers and sensors) as detailed in the schedule or on the drawings
- ✓ Fully automatic summer bypass
- ✓ Switched Live input with adjustable 'Delay-On' feature

- ✓ Fan failure or component failure indicated via individual fault code display
- ✓ Running time counter
- ✓ Control panel PIN number lock
- ✓ Automatic frost protection effective to -20°C
- ✓ Tool free filter access
- ✓ The unit shall incorporate ('H' models) an integral humidity sensor with the following features:
  - Ambient Response; Raises the humidity trigger point as dwelling temperature reduces
  - Rapid Response; Monitors the rate of change in humidity and triggers increased airflow even if the humidity trigger threshold is not reached
  - Proportional Response; Incrementally increases the fan speed to reduce noise and reduce energy consumption

### Integral Cooker Hood Specification

The Sentinel Kinetic Cooker Hood shall consist of a telescopic Hood and galvanised steel duct connection to the MVHR Unit.

The Hood construction shall be of grey powder coated steel with Brushed Aluminium or White painted fascia.

The Hood shall trigger the MVHR unit to a pre-defined boost speed and open the summer bypass when opened, and shall have two low-energy lamps illuminating the hob top.

Filter shall be a flat metal grease filter, removable for cleaning.

The galvanised steel ductwork shall provide a continuous fire barrier between the Hood and the MVHR unit. It shall contain an Intumescent fire damper, thermal cut-out and volume balancing damper. The thermal cut-out shall switch off the MVHR unit at a pre-defined safety temperature.

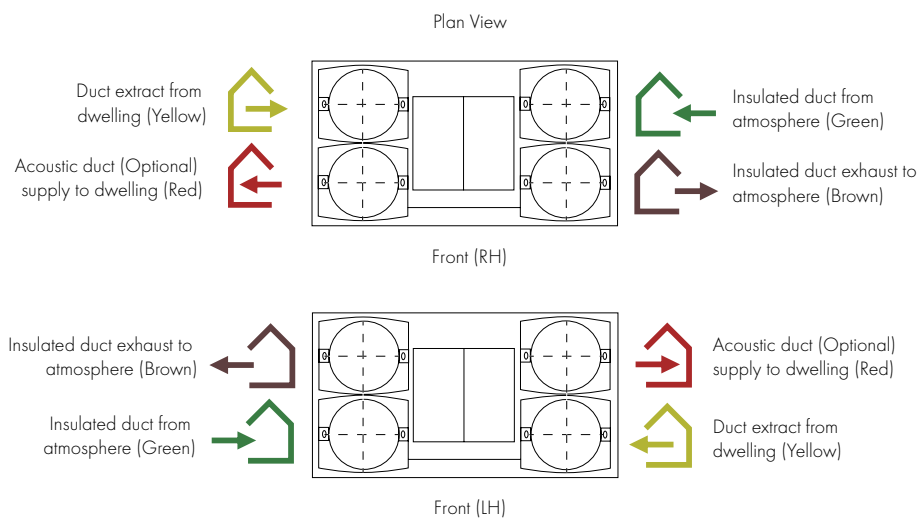
The duct shall have an access panel for cleaning by the end-user.

### Mounting Option



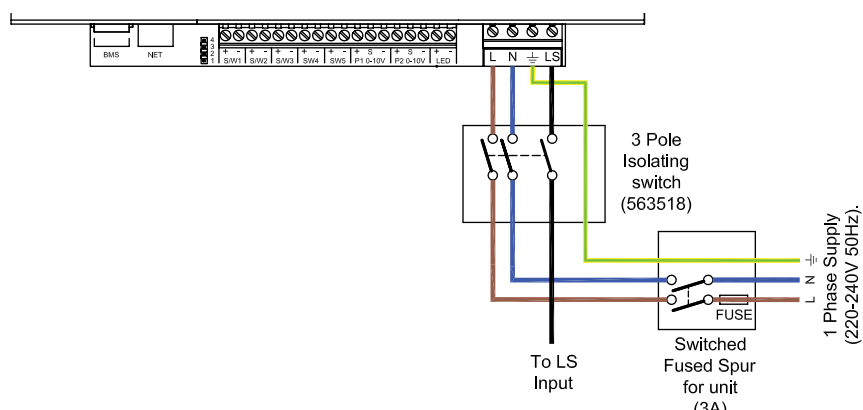
Wall

## Airflow Direction



## Electrical Connection

Please note: Electrical connection should be carried out by an appropriately qualified person and in accordance with current wiring regulations.



## Trickle to Boost by a Light Circuit

