

Our ref: RC/CMD/GM10442-007

Date: 21st January 2021

Your ref:

Mr Omar Al-Nujaifi
YPP Investments
YPP House
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Terrace
Leeds
LS2 9HZ

Dear Omar

RE: Noise Emissions from the Proposed Smoke Vents – 11 St James Square, Manchester

We write further to the acoustic assessment works and noise measurements undertaken by Wardell Armstrong LLP (WA) for the conversion and extension of 11 St James Square to form residential apartments, comments from the Environmental Health Officer (EHO) at Manchester City Council (MCC), the installation of the smoke vents and your instruction to WA to prepare this note.

The proposed development comprises the conversion of the 1st to 4th floors of 11 St James Square, Manchester to provide residential accommodation. The ground floor is proposed for retail/commercial use, and the development is located within Manchester city centre.

The smoke vents are required as part of the proposed development. The proposed smoke vents comprise two roof mounted fans which, in the event of a fire, draw smoke from the building via one fan and draw fresh air in via the other fan. The fans are installed at the eastern and western sides of the roof of the development. The vents are two way and operate on a push-pull system. Therefore, smoke can be extracted toward the west, or toward the east, with the air intake on the opposing fan.

However, routine testing of the vents is also required to ensure proper operation of the smoke vents in the event of a real fire. The vents would be tested once each week, during the daytime, for 5 minutes.



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On the 1st April 2020 the EHO at MCC made the following comment with regard to noise from the smoke vents.

“The information submitted with this app suggested that the plant was to be used in emergencies and other occasional use which leads to concerns. Normally, we ask that emergency plant is specified and selected to meet a criteria although we will permit relaxed levels and the acoustic consultant should make contact to discuss specific criteria. Generally we would accept 10dB above the background for emergency plant and would also require some comment to confirm it is used in emergency only and list a testing schedule (i.e. tested 1 times per week for 10 mins.....this is just an example to explain what we mean not a reference point)”

A response was prepared by Mr Fraser Dann of Indigo Planning stating that the smoke vents would be used only in an emergency situation, and for infrequent testing for 5 minutes per week. However, further comment was received from the EHO at MCC, which stated.

The response provides some clarification with regard to the plant's use and testing. However as stated in my previous responses there are still limits for emergency plant. We would usually accept 10dB above background at the NSR for emergency plant so will still require an assessment submitting.

A letter note was prepared by WA dated 24th April Ref: RC/CMD/GM10442-006. MCC require a noise limit of 10dB above the background sound level which has been measured by WA at the site. Using the comments provided by MCC, and the duration of testing, a noise limit of 76dB $L_{Aeq,5min}$ was defined to be achieved at the façade of the nearest noise sensitive receptor.

Correspondence was therefore undertaken between WA and the smoke vent specifier and installer, SE Controls (SEC), for the purpose of ensuring that noise from the smoke vents would not exceed the proposed limit of 76dB $L_{Aeq,5min}$ at the nearest noise sensitive receptor.

Details of the proposed smoke vents, including the manufacturers' spectral noise emission data, were issued by SEC to WA, and were inputted into the computer noise model SoundPLAN version 8.2. SoundPLAN software uses geographical information to create a model of the study area on which to generate noise contours and includes objects that affect the propagation of noise such as buildings and topography. SoundPLAN model uses the noise prediction methodology set out in ISO 9613-2:1996 'Attenuation of sound during propagation outdoors'. The noise modelling produces noise contour plans demonstrating the levels of noise from the smoke vents across the site and at the sensitive receptors near to the site.

The results of the noise modelling show that noise emissions from the smoke vents would exceed the limit proposed by MCC. However, SEC identified that the manufacturers' noise



emissions are based on the maximum noise levels which occur only when the smoke vents are operating at 100% capacity. It is understood that the smoke vents are installed and then calibrated on-site to provide sufficient air flow. The calibrated level rarely requires the fans in the smoke vents to operate at 100% capacity. Because of this, the noise emissions from the smoke vents are typically lower than stated by the manufacturers' data. SEC were confident that the as-installed smoke vents would meet the proposed 76dBL_{Aeq 5min}) noise limit, and therefore the vents were installed.

A site visit was made by WA on the 6th January 2021, following the installation and calibration of the smoke vents, to measure noise from the vents to enable modelling of the noise at the nearest sensitive receptors. Noise measurements and noise modelling were undertaken as set out below.

Measurement of Noise from the Smoke Vents

Wardell Armstrong has carried out monitoring to measure the noise emissions from the smoke vents at 11 St James Square, Manchester. The noise measurements have been used as source data at a known distance to calibrate the computer noise model.

The sound level meter was calibrated to a reference level of 94dB at 1kHz both before, and on completion of, the noise survey. No drift in calibration was measured during the survey. A-weighted L_{eq} noise levels were measured together with one-third octave data were also measured to provide additional information. The noise measurements were made using a Class 1, integrating sound level meter. The microphone was mounted on a tripod between 0.5m and 1m from the smoke vents. In addition, a further measurement was undertaken at a distance from the smoke vents at the south eastern edge of the roof area.

Noise measurements were taken with the vents operating firstly in an easterly direction, and secondly in a westerly direction. Noise from the smoke vents was dominant at all of the measurement locations.

The measurement locations are shown in Figure 1 and the measured noise levels are shown in full in Appendix A, both of which are attached to this letter.

Noise Modelling

The noise measurements, undertaken as described above, have been used to calculate the sound power level of the smoke vents and these have been inputted into the computer noise model. The noise model has been set-up as a 'worst-case' scenario with the highest measured sound level used for each measurement position. The sound power levels have been verified



in the noise model by locating receiver points in the model in the same locations as each of the measurement positions on the rooftop.

The noise model was then used to determine the noise from the smoke vents at the nearest residential receptor. Our observations during the site survey identified that the upper floors of 86 Cross Street are in the process of being converted into residential use. The adjoining building on Cross Street is in office use, and the upper floors of the buildings to the south, on St James Square, are thought to be residential.

The computer model has been used to calculate the noise from the smoke vents at the nearest residential facades. A coloured façade plot has been provided showing the noise levels at each façade of the surrounding residential buildings in Figure 2. The calculated noise levels are shown in Table 1 below.

Table 1 – Calculated façade noise levels			
Receptor	Address	Floor	Calculated Sound Level
ESR1	42 St James Square	4 th Floor	73.1dB(A)
ESR2	44 St James Square	4 th Floor	74.1 dB(A)
ESR3	46 St James Square	4 th Floor	72.5 dB(A)
ESR4	86 Cross Street	3 rd Floor	60.3 dB(A)

The results of the noise model show that noise from the smoke vents is lower than the noise limit proposed by MCC. Therefore, no mitigation measures are required to reduce the noise emissions.

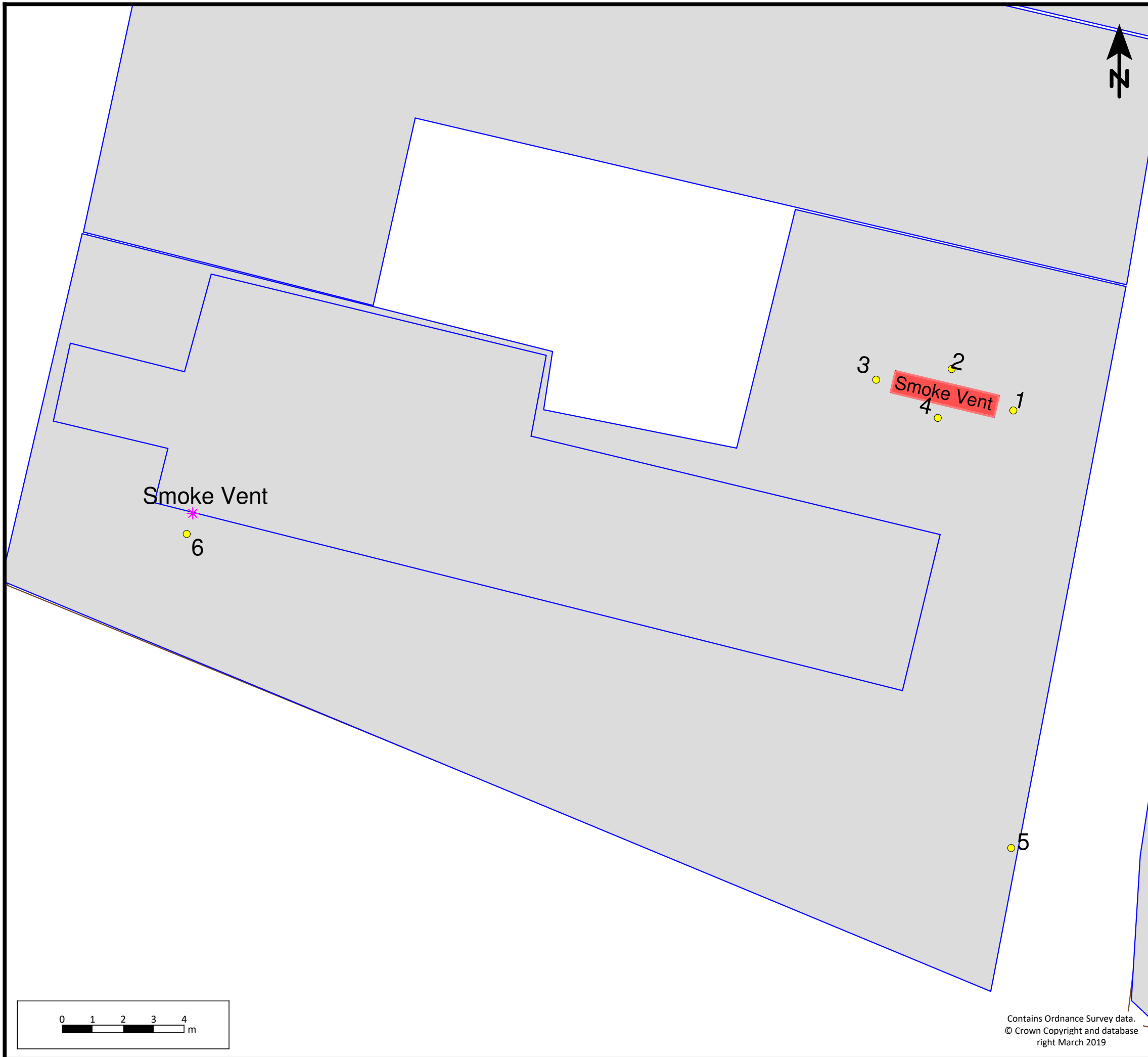
We trust that the information contained in this letter is clear, however please do not hesitate to contact me should you require anything further.

Yours sincerely
for Wardell Armstrong

RICHARD CALVERT
Associate Director
rcalvert@wardell-armstrong.com

MARK DAWSON
Technical Director
mdawson@wardell-armstrong.com

File	20210106_142132_142903_1											
Start	06/01/2021 14:21											
End	06/01/2021 14:40											
Measurement Location	1		2		3		4		5		6	
Extraction Direction	West	East	West	East	West	East	West	East	West	East	West	East
LAeq	94.0	92.2	80.6	81.0	69.1	70.6	79.1	80.4	66.9	66.9	98.8	101.2
20Hz	67.3	88.4	62.1	61.5	61.0	62.8	60.4	63.0	61.6	57.2	94.4	80.5
25Hz	71.5	85.6	63.1	64.1	61.7	63.3	64.6	66.4	62.8	57.6	92.6	74.9
31.5Hz	82.1	84.0	76.9	71.4	66.5	68.4	76.7	79.4	62.4	70.9	90.7	89.3
40Hz	80.6	81.8	69.5	69.2	65.0	69.6	70.6	76.7	63.8	61.7	89.2	77.5
50Hz	80.6	80.0	68.1	67.6	66.2	67.7	70.3	70.6	64.3	62.0	87.5	77.7
63Hz	81.0	79.6	71.1	68.6	64.1	64.9	70.2	70.2	63.3	62.0	86.5	81.2
80Hz	80.6	78.2	68.4	66.3	64.4	61.3	69.1	67.6	63.5	62.0	85.6	82.3
100Hz	80.9	78.0	68.1	68.4	65.3	64.2	71.0	69.6	64.2	63.2	83.3	82.6
125Hz	77.5	75.4	69.3	69.7	66.7	67.4	74.1	72.7	64.9	65.8	82.6	81.0
160Hz	81.3	75.5	75.0	73.6	69.1	68.0	75.6	73.9	70.9	71.4	82.2	82.7
200Hz	93.4	89.3	78.5	76.4	67.7	65.7	77.0	71.8	68.6	65.5	89.0	88.3
250Hz	87.1	87.4	70.9	74.1	63.4	65.2	70.8	70.6	64.3	64.2	88.6	90.2
315Hz	91.0	84.5	73.5	75.4	65.9	66.3	71.1	73.7	59.6	61.0	92.3	92.9
400Hz	78.3	80.3	69.3	72.3	60.3	63.6	65.7	72.2	59.3	60.0	93.0	91.2
500Hz	81.7	82.4	77.3	73.5	65.8	65.4	73.1	73.3	59.2	59.6	92.5	94.3
630Hz	77.0	78.7	72.2	72.0	61.1	63.6	67.8	68.8	56.3	55.4	88.2	92.9
800Hz	74.7	81.2	72.3	72.8	59.9	62.5	69.9	71.9	56.7	56.0	90.1	93.9
1kHz	83.4	83.7	71.5	71.2	58.4	61.1	71.0	70.9	57.0	56.2	89.3	93.2
1.25kHz	87.8	83.3	69.4	71.0	56.9	58.7	69.5	70.1	56.2	56.1	90.5	91.2
1.6kHz	84.4	82.7	67.3	69.1	54.2	56.3	65.8	68.9	54.0	55.2	87.8	90.4
2kHz	81.1	80.0	65.7	68.2	52.7	54.9	65.1	67.8	51.0	52.4	86.3	88.0
2.5kHz	80.1	78.6	65.0	66.7	50.8	52.7	64.8	67.4	49.5	51.1	84.4	86.8
3.15kHz	79.7	78.6	63.9	66.4	48.8	51.6	64.3	66.5	47.1	48.9	82.6	85.7
4kHz	78.2	76.5	65.1	65.5	48.3	49.8	67.0	68.2	46.0	46.5	80.2	83.8
5kHz	74.8	73.7	56.5	59.8	42.5	44.7	57.1	60.3	39.8	41.9	76.6	80.1
6.3kHz	70.8	70.2	50.4	53.2	39.5	41.5	51.4	53.2	36.9	37.4	73.0	76.1
8kHz	67.2	67.5	49.8	51.3	36.3	39.1	50.0	52.0	32.7	34.3	69.9	73.2
10kHz	63.3	63.9	43.2	45.4	33.1	36.0	44.8	45.6	27.5	29.9	66.3	70.1
12.5kHz	59.2	59.7	40.6	42.7	28.7	32.4	42.3	43.3	22.3	24.9	62.7	67.2
16kHz	54.6	54.9	38.1	37.6	24.1	27.1	38.7	38.0	15.4	18.2	58.6	63.8
20kHz	47.9	47.9	30.3	31.3	21.9	22.3	30.1	31.4	9.4	10.9	53.0	58.3



Key

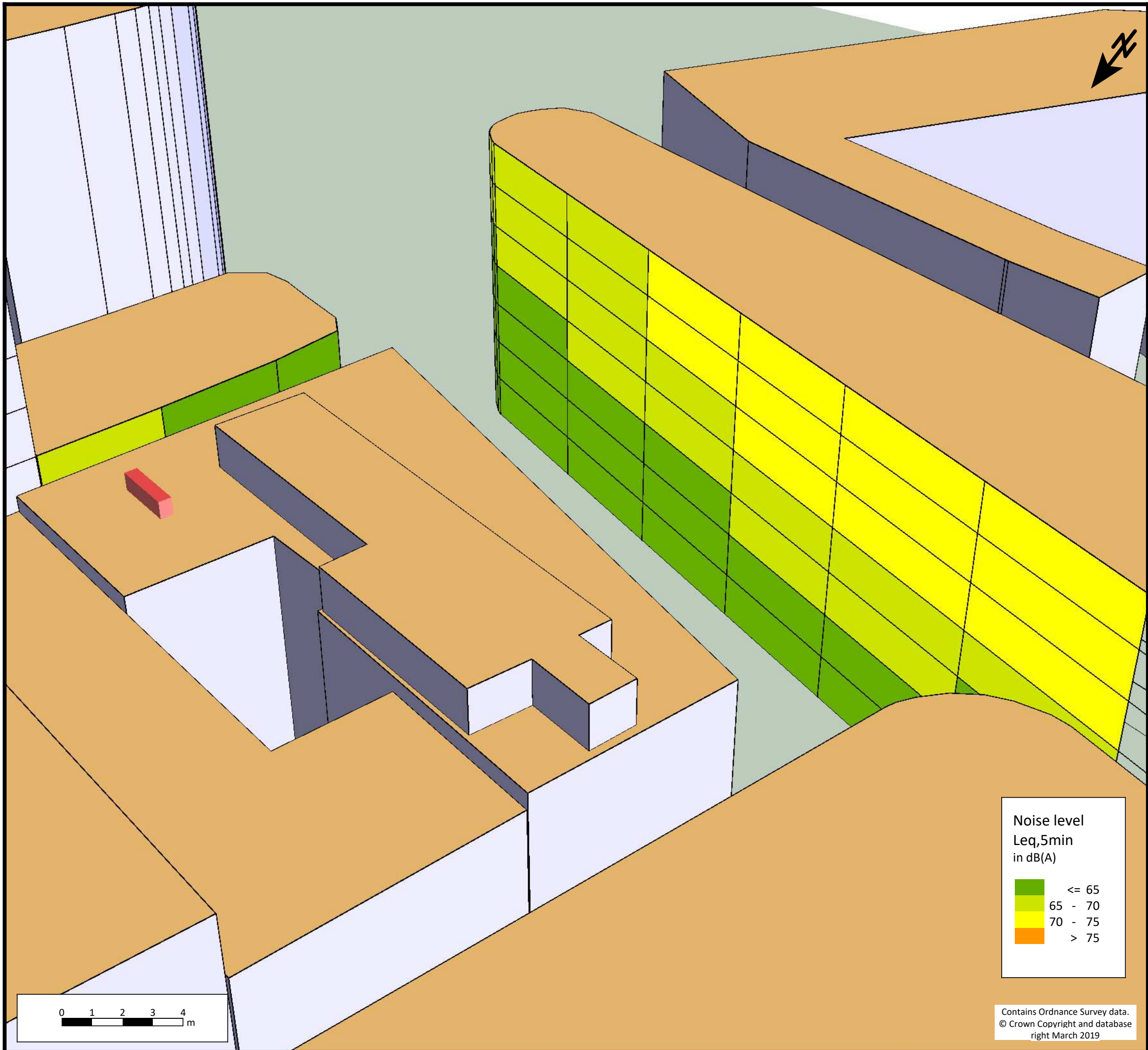
- * Western Smoke Vent
- Eastern Smoke Vent
- Measurement Point

CLIENT:			YPP Investments		
PROJECT:			11 St James Square, Manchester		
DRAWING TITLE:			Noise Measurements Locations		
DRG NO:		Figure 1		REV:	A
DRG SIZE:	A3	SCALE:	1:125	DATE:	21/01/2021
DRAWN BY	RC	CHECKED BY	RC	APPROVED BY	CMD



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Key

Eastern Smoke Vent

CLIENT:			YPP Investments		
PROJECT:			11 St James Square, Manchester		
DRAWING TITLE:			Facade Noise Levels		
DRG NO:		Figure 2		REV:	A
DRG SIZE:	A3	SCALE:	1:213	DATE:	21/01/2021
DRAWN BY	RC	CHECKED BY	RC	APPROVED BY	CMD



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