

O23295-R15-A

9 February 2025

Eliza Yard, Poland St Zone

Planning Condition 16b discharge report

**SANDY
BROWN**
ACOUSTICS

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Version	Date	Comments	Author	Reviewer
A	9 Feb 25		SC	JA
B	10 Feb 25	Formatting corrections	SC	JA

Disclaimer

This report has been prepared for the sole benefit and use of our client based on their instructions and requirements. Sandy Brown Ltd extends no liability in respect of the information contained in the report to any third party.

Summary

Sandy Brown has been appointed by John Sisk & Son Ltd to provide acoustic advice on the new build residential development Manchester Life Development Company 3 Ltd scheme at Eliza Yard, at the corner of Jersey Street and Poland Street in Manchester.

The proposal comprises an 8-storey building forming 126 residential apartments and ground floor commercial and amenity spaces.

Planning Permission has been granted under application number 139288/JO/2024. Plant noise egress limits are set out in 023295-R01-C *Planning noise report (Eliza Yard)* dated 14 February 2024, in line with the MCC criteria and Planning Condition 16.

This report sets out relevant information to discharge Planning Condition 16b.

The results of near field sample measurements of operational and safely accessible plant have been assessed to inform the plant noise egress assessment. These measurements were undertaken on 29 January 2025.,

The plant noise egress limits for normally operating plant are expected to be achieved.

The plant noise egress limits for emergency plant are expected to be achieved during the day, though a 4 dB exceedance is predicted at night due to contributions from the emergency generator. Given that a low noise generator has been selected and significant attenuation measures have been adopted, it is proposed that a 4 dB exceedance to the emergency plant noise limits at night may be acceptable. This is on the basis that all practical mitigation measures have been included, routine testing is only carried out during the day and emergency plant operation at night would be during an actual life safety emergency only. This is subject to agreement with MCC.

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1 Introduction

Sandy Brown has been appointed by John Sisk & Son Ltd to provide acoustic advice on the proposed new build Manchester Life Development Company 3 Ltd scheme at Eliza Yard, at the corner of Jersey Street and Poland Street in Manchester.

The proposal comprises an 8-storey building forming 126 residential apartments and ground floor commercial and amenity spaces.

Planning Permission has been granted under application number 139288/JO/2024. Plant noise egress limits are set out in O23295-R01-C *Planning noise report (Eliza Yard)* dated 14 February 2024, in line with the MCC criteria and Planning Condition 16.

This report sets out relevant information to discharge Planning Condition 16b which relates to plant noise egress.

Sample noise measurements were undertaken on 19 January 2026. These measurements form the basis of the plant noise egress assessment which has been carried out to discharge Planning Condition 16b.

2 Site description

2.1 The site and its surroundings

The site location in relation to its surroundings is shown in Figure 1, highlighted in red. The proposal comprises an 8-storey building forming 126 residential apartments and ground floor commercial and amenity spaces.

Externally mounted noise generating plant is installed as part of the development which is detailed within this report.

The Site is bounded by Poland Street to the west, Jersey Street to the south, the City Court Trading Estate to the north, and a surface car park to the east.

The Site can be accessed by pedestrians via Jersey Street.



Figure 1 Aerial view of the site (courtesy of Google Earth Pro)

2.2 Adjacent premises

A summary of the nearby noise sensitive premises is set out below in reference to Figure 1:

- Residential premises on Jersey St, Rodney St and Mozart Close to the north east (highlighted in yellow)
- Residential premises at Flint Glass Wharf to the south west (highlighted in light blue)
- Residential premises at Canal Point, Navigation Street, Burgess House, Avro House and 3 New Union St to the south (highlighted in navy blue)
- Trading estate at City Court to the north (highlighted in orange)
- Flint Glass Works, 62-64 Jersey St understood to be commercial to the south west (highlighted in green)
- Pheonix Ironworks (137346/FO/2023) is a proposed development to the north west of the site, to the current warehouse spaces highlighted in pink
- Factories on George Leigh St and Naval St to the north west (highlighted in purple).

In addition to the above existing receptors, there is another Manchester Life Development Company 3 Ltd scheme, Jersey Wharf (133769/FO/2022), proposed to the south of the site, across Jersey Street (outlined in yellow).

3 Plant noise egress criteria

The wording of Planning Condition 16 as per application number 139288/JO/2024 is as follows:

"16) (a) Prior to the first occupation of the development, details of any externally mounted ancillary plant, equipment and servicing shall be submitted for approval in writing by the City Council, as Local Planning Authority. For the avoidance of doubt, externally mounted plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.

(b) Prior to the first occupation of the development, a verification report will be required to validate that the work undertaken conforms to the recommendations and requirements approved as part of part (a) of this planning condition. The verification report shall include post completion testing to confirm the noise criteria has been met. In instances of non-conformity, these shall be detailed along with mitigation measures required to ensure compliance with the noise criteria. A verification report and measures shall be agreed until such a time as the development complies with part (a) of this planning condition."

3.1 Standard guidance

BS 4142:2014:+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS 4142) provides a method for assessing noise from items such as building services plant against the existing background sound levels at nearby noise sensitive premises.

BS 4142 suggests that if the noise level is 10 dB or more higher than the existing background sound level, it is likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact. If the level does not exceed the background sound level, it is an indication of having a low impact.

If the noise contains 'attention catching features' such as tones, bangs etc, a penalty, based on the type and impact of those features, is applied.

3.2 Plant noise egress limits

The following plant noise egress limits were established following a baseline noise survey at the site between 25 February 2021 and 5 March 2021 and between 25 August 2021 and 7 September 2021, as detailed in O23295-R01-C *Planning noise report (Eliza Yard)* dated 14 February 2024.

3.2.1 Normally operating plant items

The cumulative noise levels from the operation of all new plant at 1 m from the worst affected window of the nearest noise sensitive premises shall not exceed the limits set out in Table 1, in line with the MCC criteria and Planning Condition 16.

These limits do not include any attention catching features. Penalty corrections for attention catching features may be significant and will need to be considered in line with BS4142.

Plant noise egress to external publicly accessible locations shall be limited to be no higher than L_{Aeq} 55 dB.

Table 1 Plant noise limits at 1 m from the nearest noise sensitive premises

Location	Maximum sound pressure level at 1 m from noise sensitive premises, $L_{Aeq,15min}$ (dB)	
	Day (07:00–23:00)	Night (23:00–07:00)
NSPs to the east and south	40	34
NSPs to the north and west	39	34

3.2.2 Emergency plant items

Relaxations of 15 dB over the limits given above have been agreed with MCC for emergency plant items operating for a short period. The limits for emergency plant are provided in Table 2. All routine testing of emergency plant shall be during the day for brief periods.

Table 2 Emergency plant noise limits at 1 m from the nearest noise sensitive premises

Location	Maximum sound pressure level at 1 m from noise sensitive premises, $L_{Aeq,15min}$ (dB)	
	Day (07:00–23:00)	Night (23:00–07:00)
NSPs to the east and south	55	49
NSPs to the north and west	54	49

3.2.3 Attention catching features

The noise from building services plant and systems shall not contain any distinguishable, discrete, continuous notes (whine, hiss, screech, hum, etc) or distinct impulses (bangs, clicks, clatters or thumps) and shall not be irregular enough to attract attention.

Further guidance on attention catching features is provided in Appendix A.

4 Installed and proposed plant

4.1 Normally operating plant items

The planning condition specifically relates to externally mounted plant. All normally operating plant units are internally mounted but have atmospheric terminations and so have been considered within the assessment.

The following items of normally operating plant are proposed, based on information received from Ameen (the building services engineer).

- 1 x Ground floor HRU
- 1 x ENERGISAVA 250CA MVHR unit per apartment

The location of the ground floor HRU is shown in red in Figure 2.

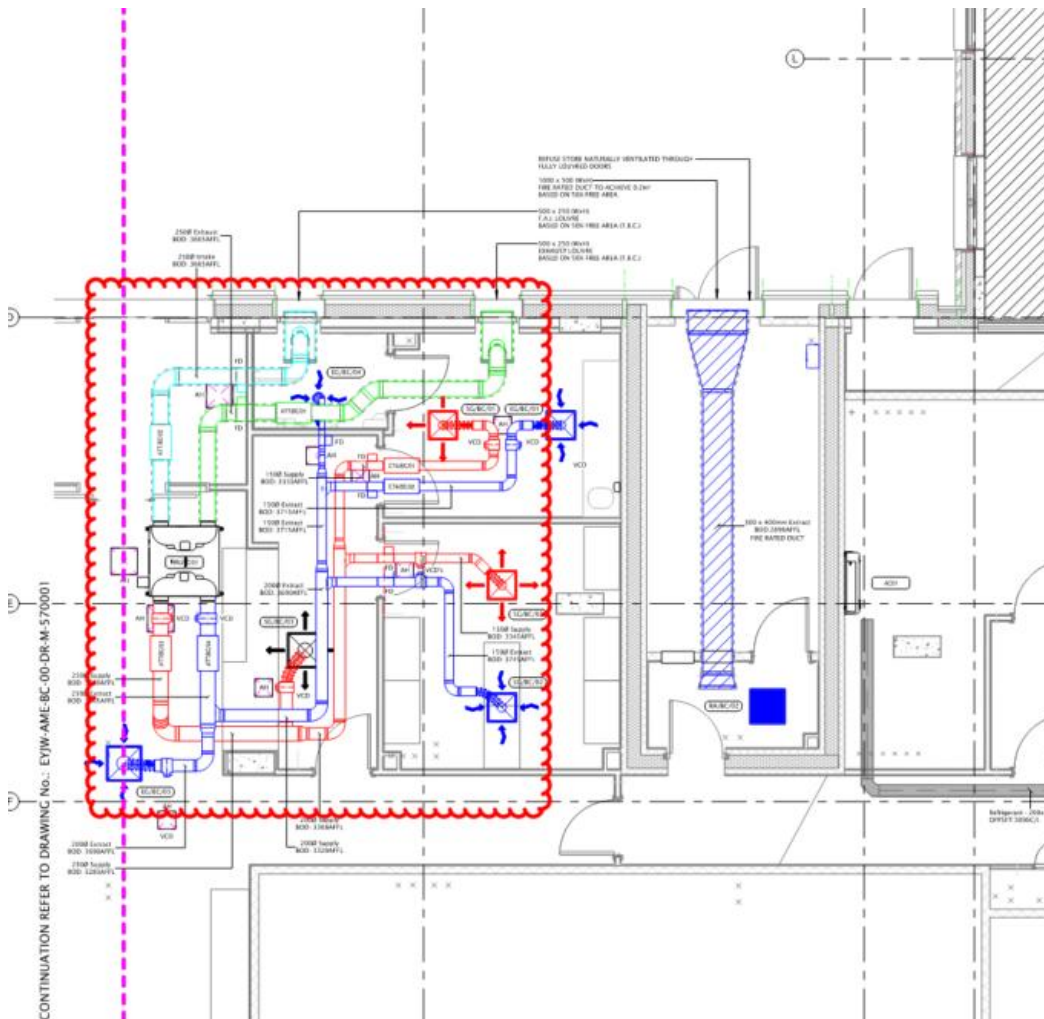


Figure 2 HRU location (EYJW-AME-BC-00-DR-M-570002)

The received sound pressure levels measured at 1.5 m for the installed HRU are presented in Table 3.

Table 3 Received HRU sound pressure levels at 1.5 m

Item	Sound pressure level L_{eq} (dB) at 1.5 m ^[1]							
	Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
HRU Block C	45	48	41	35	33	27	23	21

^[1] Sound pressure data from the HRU Technical submittal (EYJW-AME-ZZ-XX-TQ-M-000012-P01)

Attenuators are proposed to the HRU, the received insertion losses of the proposed attenuator are shown in Table 4.

Table 4 Proposed HRU attenuator insertion losses

Item	Insertion loss L_i (dB) ^[1]							
	Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
HRU Block C	1	2	6	15	20	15	14	10

^[1] Insertion loss data from the HRU Technical submittal (EYJW-AME-ZZ-XX-TQ-M-000012-P01)

The received sound power levels for installed MVHRs are shown in Table 5. Each apartment has an intake and exhaust termination serving the MVHR, located at the apartment facade at high level.

Table 5 MVHR sound power levels

Item	Sound power level L_w , (dB) ^[1]							
	Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
1 Bedroom Inlet	46	45	45	33	25	23	19	20
1 Bedroom Outlet	54	54	46	39	28	29	26	21
2 Bedroom Inlet	48	47	49	37	28	26	21	21
2 Bedroom Outlet	56	57	50	43	32	33	30	23

^[1] Sound power data from the MVHR Technical submittal (EYJW-AME-ZZ-XX-TQ-M-000014-P04)

[2]

4.2 Emergency plant items

The following items of emergency plant are installed:

- Emergency generator located on the roof
- Smoke extract fan located on the ground floor.

The location of the emergency generator is shown in Figure 3.

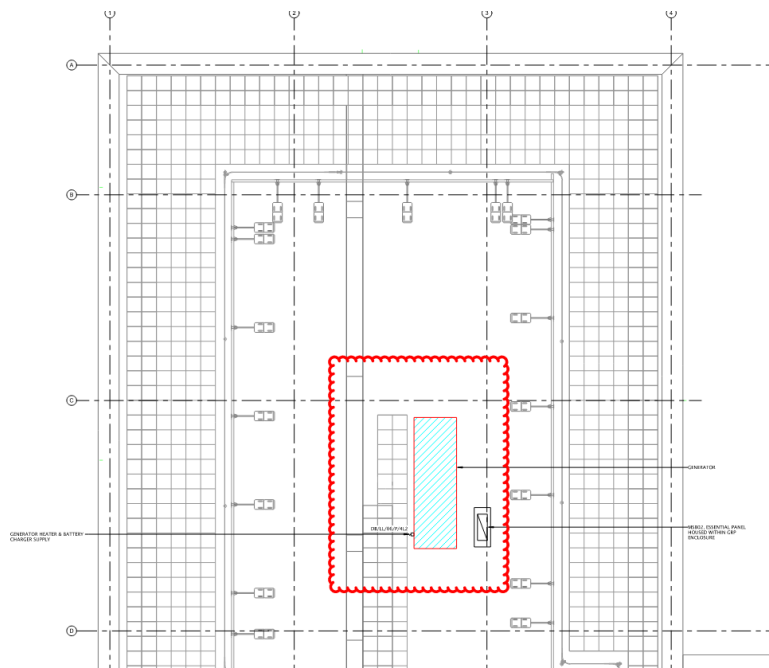


Figure 3 Generator location (EYJW-AME-BC-RF-DR-E-620009)

Sound pressure levels at 1 m of the generator elements (received from Ameen via email 7 May 2025 and 13 May 2025) are shown in Table 6.

Table 6 Received generator sound pressure levels – generator

Item	Sound pressure level L_{eq} , (dB), at 1 m							
	Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Inlet ^[1]	88	85	73	56	47	45	49	61
Outlet ^[1]	88	84	72	52	49	47	43	54
Enclosure	74	77	67	60	50	43	36	35
Exhaust Outlet	74	65	59	55	55	57	61	71

^[1] Includes losses from all attenuation

Attenuation is installed to the generator discharge. The insertion losses of the attenuation are shown in Table 7.

Table 7 Attenuator insertion losses

Item	Insertion loss, L_i (dB)							
	Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Inlet attenuator	8	11	17	26	33	38	36	30
Outlet attenuator	10	16	27	42	53	59	56	44

^[2] These losses have been accounted for in the discharge sound pressure levels shown in Table 6.

The location of the ground floor smoke extract fan is shown in Figure 4.



The received noise data for the smoke extract fan is provided in Table 8, with the proposed attenuation insertion losses summarised in Table 9.

Table 8 Smoke extract fan sound power level data

Smoke extract fan outlet

Table 9 Smoke extract fan attenuator insertion losses

Item	Insertion loss, D_i (dB)							
	Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Smoke extract fan attenuator	2	4	8	16	32	29	26	15

5 Measurements

Attended measurements of the noise levels associated with the installed plant items were carried out on 29 January 2026. At all locations measurements were at least 1.5 m above the ground/roof level and at least 1 m from any other reflective surface.

Details of the measurement methodology and sound level meters used are provided in Appendix C.

A mark-up of the measurement locations is provided in Appendix B.

5.1 Results

A summary of the measurement results is provided in Table 11. No tonal characteristics were noted during the measurements, as such a correction for attention catching features has not been applied.

Measurements at nearby noise sensitive receptors both during generator operation and while the generator was switched off have also been undertaken.

A summary of these measurements and commentary is provided in Table 10.

Table 10 Summary of generator measurements at nearby noise sensitive receptors

Test ref	Location	Measured A-weighted sound pressure level, $L_{Aeq,15min}$ (dB)	Comments
1	Free-field background measurement at Block A	44	Wind noise and distant traffic dominant.
2	Free-field background measurement at Block hoarding	46	Distant traffic and aircraft dominant.
3	Generator switched on at same position as measurement 1	46	Generator inaudible during measurement. Similar sources to measurement 1

Test ref	Location	Measured A-weighted sound pressure level, $L_{Aeq,15min}$ (dB)	Comments
4	Generator switched on at same position as measurement 2	46	Generator inaudible during measurement. Similar sources to measurement 2

Table 11 Summary of external plant noise measurement results

Test ref	Location	Measured A-weighted sound pressure level, $L_{Aeq,1min}$ (dB)	Comments
5	1 m from generator intake	68	Generator intake dominant
6	1 m from generator intake	68	Generator intake dominant
7	1 m from generator intake	68	Generator intake dominant
8	2 m from generator intake	65	Generator intake dominant
9	2 m from generator intake	65	Generator intake dominant
10	2 m from generator intake	65	Generator intake dominant
11	1 m from generator side	70	Generator exhaust dominant
12	1 m from generator side	70	Generator exhaust dominant
13	1 m from generator side	70	Generator exhaust dominant
14	2 m from generator side	68	Generator exhaust dominant
15	2 m from generator side	68	Generator exhaust dominant
16	2 m from generator side	68	Generator exhaust dominant
17	1 m from generator exhaust	72	Generator exhaust dominant
18	1 m from generator exhaust	71	Generator exhaust dominant
19	1 m from generator exhaust	72	Generator exhaust dominant
20	2 m from generator exhaust	68	Generator exhaust dominant
21	2 m from generator exhaust	68	Generator exhaust dominant
22	2 m from generator exhaust	68	Generator exhaust dominant

Test ref	Location	Measured A-weighted sound pressure level, $L_{Aeq,1min}$ (dB)	Comments
23	Background noise levels on rooftop	44	Dominated by distant road traffic
24	Background noise levels on rooftop	44	Dominated by distant road traffic
25	Background noise levels on rooftop	43	Dominated by distant road traffic
26	1 m from 1-bed MVHR exhaust	44	Dominated by wind noise, MVHR exhaust inaudible
27	1 m from 1-bed MVHR exhaust	44	Dominated by wind noise, MVHR exhaust inaudible
28	1 m from 1-bed MVHR exhaust	43	Dominated by wind noise, MVHR exhaust inaudible
29	2 m from 1-bed MVHR exhaust	43	Dominated by wind noise, MVHR exhaust inaudible
30	2 m from 1-bed MVHR exhaust	43	Dominated by wind noise, MVHR exhaust inaudible
31	2 m from 1-bed MVHR exhaust	43	Dominated by wind noise, MVHR exhaust inaudible
32	1 m from 1-bed MVHR intake	43	Dominated by wind noise, MVHR intake inaudible
33	1 m from 1-bed MVHR intake	44	Dominated by wind noise, MVHR intake inaudible
34	1 m from 1-bed MVHR intake	46	Dominated by wind noise, MVHR intake inaudible
35	2 m from 1-bed MVHR intake	44	Dominated by wind noise, MVHR intake inaudible
36	2 m from 1-bed MVHR intake	43	Dominated by wind noise, MVHR intake inaudible
37	2 m from 1-bed MVHR intake	44	Dominated by wind noise, MVHR intake inaudible
38	Background measurement between 1-bed MVHR terminations	43	Dominated by wind noise

Test ref	Location	Measured A-weighted sound pressure level, $L_{Aeq,1min}$ (dB)	Comments
39	Background measurement between 1-bed MVHR terminations	45	Dominated by wind noise
40	1-bed Background measurement between MVHR terminations	44	Dominated by wind noise
41	1 m from 2-bed MVHR exhaust	46	Dominated by wind noise, MVHR inaudible.
42	1 m from 2-bed MVHR exhaust	45	Dominated by wind noise, MVHR inaudible.
43	1 m from 2-bed MVHR exhaust	45	Dominated by wind noise, MVHR inaudible.
44	2 m from 2-bed MVHR exhaust	45	Dominated by wind noise, MVHR inaudible.
45	2 m from 2-bed MVHR exhaust	46	Dominated by wind noise, MVHR inaudible.
46	2 m from 2-bed MVHR exhaust	44	Dominated by wind noise, MVHR inaudible.
47	1 m from 2-bed MVHR intake	44	Dominated by wind noise, MVHR inaudible.
48	1 m from 2-bed MVHR intake	44	Dominated by wind noise, MVHR inaudible.
49	1 m from 2-bed MVHR intake	45	Dominated by wind noise, MVHR inaudible.
50	2 m from 2-bed MVHR intake	44	Dominated by wind noise, MVHR inaudible.
51	2 m from 2-bed MVHR intake	45	Dominated by wind noise, MVHR inaudible.
52	2 m from 2-bed MVHR intake	42	Dominated by wind noise, MVHR inaudible.
53	Background measurement between 2-bed MVHR terminations	42	Dominated by wind noise,
54	Background measurement between 2-bed MVHR terminations	42	Dominated by wind noise,

Test ref	Location	Measured A-weighted sound pressure level, $L_{Aeq,1min}$ (dB)	Comments
55	Background measurement between 2-bed MVHR terminations	43	Dominated by wind noise,

6 Assessment

6.1 Normal operation

Noise associated with the MVHR units was not audible at any of the measurement positions. On the basis that MVHR noise was not audible at the near field measurement positions, detailed assessment is not expected to be required to demonstrate compliance with Planning Condition 16b.

The plant noise egress assessment presented in Sandy Brown report 23295-R08-A is expected to be representative of a worst case scenario assessment.

At all positions during the survey, tonal features were inaudible. As the MVHR units are expected to operate continuously throughout the day, no impulsivity is expected to be perceivable. As such no corrections have been applied for attention catching features (as per Section 3.2.3).

Assessment for all other normally operating plant is outlined in Sandy Brown report 23295-R08-A which provides a desktop assessment of normally operating plant to discharge Part A of Planning Condition 16.

The results of this assessment indicate that plant noise egress due to normally operating plant is predicted to comply with the acoustic criteria for both day and night periods at all nearby noise sensitive receptors.

Any future tenant plant would need to be controlled to at least 10 dB below the overall plant noise egress limits.

6.2 Emergency plant items

This assessment considers noise from the generator and from the smoke extract fans operating at 30% capacity (this is understood to correspond to routine testing conditions). This assessment assumes all plant is operating simultaneously. In practice, the plant items may be tested individually, therefore, this assessment considers the worst-case scenario.

It is understood that routine testing will only occur during the day. On this basis, the emergency plant noise egress for routine testing has only been assessed against the criteria for day.

Based on the measurements outlined in Table 11, the generator unit sound pressure levels have been calculated by correcting the measurements for the residual background noise level measured at each position.

These values are outlined in Table 12.

Table 12 Calculated generator sound pressure level

Item	Sound pressure level at 1 m, L_{eq} (dB)							
	Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Intake	88	85	73	56	47	45	49	61
Exhaust	88	84	72	52	49	47	43	54
Casing	74	77	67	60	50	43	36	35

A summary of predicted emergency plant noise egress levels is presented in Table 13.

Table 13 Emergency plant noise egress predicted levels and criteria

Receptor	Predicted emergency plant noise egress level, L_{Aeq} (dB)	Maximum emergency plant noise criteria, L_{Aeq} (dB)
Pheonix Ironworks	53	54 (day), 49 (night)
Jersey Wharf	44	55 (day), 49 (night)
City Road trading estate	46	55 (day), 49 (night)
Flint Glass Wharf	34	55 (day), 49 (night)

Emergency plant noise egress is predicted to meet the day criterion at all noise sensitive receptors, however a 4 dB exceedance to the night criterion is noted to Phoenix Ironworks.

Given that a low noise generator has been selected and significant attenuation measures have been adopted, it is proposed that a 4 dB exceedance to the emergency plant noise limits at night may be acceptable. This is on the basis that all practical mitigation measures have been included, routine testing is only carried out during the day, and any emergency plant operation at night would be during an actual life safety emergency only. This is subject to agreement with MCC.

Appendix A

BS 4142 corrections for attention catching features

The following applies where plant noise is assessed in accordance with BS 4142:2014+A1:2019.

If the proposed plant noise contains attention catching features (such as tonal elements, whines, whistles, bangs etc), penalty corrections should be applied based on the type and impact of the features.

If appropriate, a subjective assessment of the plant features can be adopted. Where the plant noise contains tonal elements, the following corrections can be made depending on how perceptible the tone is at the noise receptor:

- 0 dB where the tone is not perceptible
- 2 dB where the tone is just perceptible
- 4 dB where the tone is clearly perceptible
- 6 dB where the tone is highly perceptible.

Where the plant noise is impulsive, the following corrections can be made depending on how perceptible the impulsivity is at the noise receptor:

- 0 dB where the impulse is not perceptible
- 3 dB where the impulse is just perceptible
- 6 dB where the impulse is clearly perceptible
- 9 dB where the impulse is highly perceptible.

For noise which is equally both impulsive and tonal, then both features can be accounted for by linearly summing the corrections for both characteristics.

If the plant has other distinctive characteristics, such as intermittency, then a 3 dB correction can be made.

If a subjective assessment of tonality is not appropriate, an objective assessment can be made by analysis of time-averaged, third-octave band sound pressure levels. A noise source is deemed to be tonal if the level in a third-octave band exceeds the level in adjacent third-octave bands by the level differences given below:

- 15 dB in the low frequency third-octave bands (25 Hz to 125 Hz)
- 8 dB in the mid frequency third-octave bands (160 Hz to 400 Hz)
- 5 dB in the high frequency third-octave bands (500 Hz to 10000 Hz).

If an objective assessment identifies the plant noise to be tonal then a 6 dB correction must be made.

Appendix B

Measurement location mark-ups



Positions 29–31
and 35–37

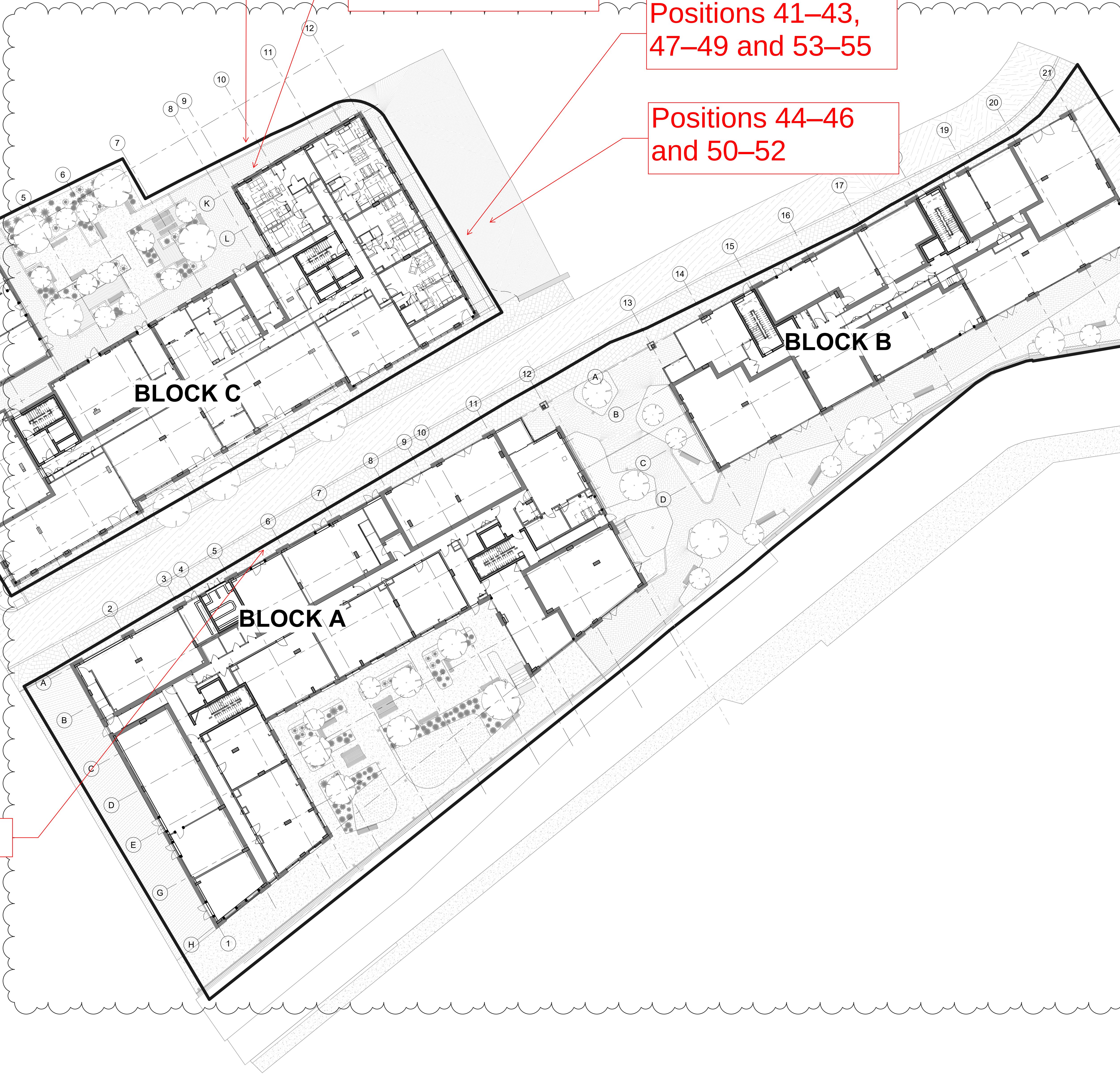
Positions 26–28,
32–34 and 38–40

Positions 41–43,
47–49 and 53–55

Positions 44–46
and 50–52

Positions 2 & 4

Positions 1 & 3



Positions
11-13

Positions 23-25

Positions 20-22

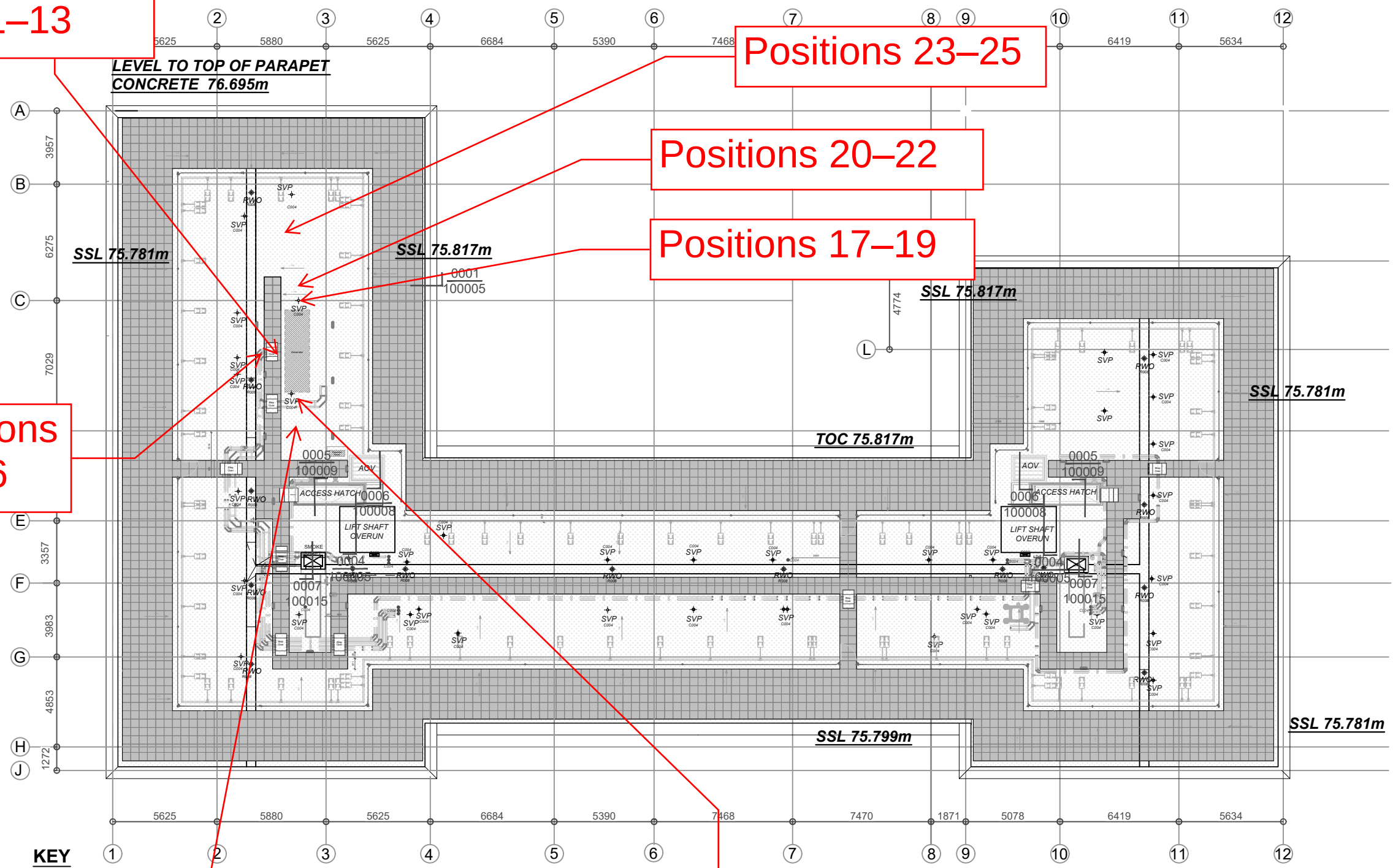
Positions 17-19

Positions
14-16

Positions 5-7

Positions 8-10

ROOF PLAN:



KEY

- 38 SVP (110mm Dia)
Set out as per M&E contractor
- 15 RWO (110mm Dia)
- 13 Other building works Openings (110mm Dia)
- 3217No. Paving slabs 450x450 x50 mm
- 20 / 40mm stone ballast
- M&E Set out as per:
EYJW-AME-BC-RF-DR-M-520015
- Structural Openings set out as per:
EYJW-RBG-BC-RF-DR-S-008001

Roof Level Builders Works Openings	
Reference:	Opening dimensions
38 x C004	120
15x R008	250 (L) x 250 (W) For RWO
2 x R002	500 (L) x 150 (W) TBC

- Mansafe and Guardrail shown indicative only. Exact set out and details to be issued separately with Specialist Sub Contractor design.
- Stepovers shown indicatively only - supplied by other trade.
- Roof mounted plant and containment indicative only. For information refer to MEP package design.

IF IN DOUBT ASK
DO NOT SCALE THIS DRAWING

DISCLAIMER
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This drawing should be read in conjunction with all relevant design drawings, calculations and system manufacturers instructions.
Deviation from the design is not permitted.
Any discrepancies are to be notified to Advanced Roofing Design Dept. immediately.

LEGEND

NOTES

See drawing 100004 for specification

DRAWING STATUS
FOR
CONSTRUCTION

C02	Slab layout amended	06.05.25	LP
C01	Construction Issue	27.03.25	LP
P01	First Issue	29.11.24	LP
Revision	Description	Date	Initials



Project	ELIZA YARD		
Package	ROOFING		
Title	Block C - Roof Plan		
Cad File Name	Drawn By	Approved	Checked
-	LP		TG
Date	Scale	Size	A3
19.11.24	1:250		
Name	Main roof plan		
Drawing No	EYJW-ADR-BC-RF-DR-X-100001		
Revision	C02		
Status	CONSTRUCTION		

Appendix C

Survey details

Reference standards

- BS 7445 Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures*
- BS 7445: Part 2: 1991 *Description and measurement of environmental noise, Part 2. Guide to the acquisition of data pertinent to land use.*

Equipment

The unattended and attended noise measurements were taken using a Rion NL-52 sound level meter.

Calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Sound level meter	NL-52/00932326	Rion	24 Apr 26	TCRT23/1806
Microphone	UC-59/09251	Rion	24 Apr 26	TCRT23/1806
Pre-amp	NH-25/32354	Rion	24 Apr 26	TCRT23/1806
Calibrator	NC-74/34536129	Rion	24 Apr 26	TCRT23/1576

Calibration of the meters used for the measurements is traceable to national standards. Calibration certificates for the sound level meter used in this survey are available upon request.

Calibration checks were carried out on the meters and their measurement chains at the beginning and end of the survey. No significant calibration deviation occurred.

Noise indices

Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg, L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS 7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures.*

Weather conditions

During the attended noise measurements, the weather was generally clear and dry and no rain occurred.

These weather conditions are considered suitable for obtaining representative measurements.

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**SANDY
BROWN**
ACOUSTICS