15037-R21-B
28 April 2026

Old Granada Studios, Manchester

Planning condition 17 discharge report

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ACOUSTICS

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Version	Date	Comments	Author	Reviewer
A	19 Dec 26		JP	JA
B	28 Apr 26	Updated plant measurements and assessment	JMG	JA

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Summary

Sandy Brown has been appointed by Manchester Quays Developments (OGS) Ltd to carry out acoustic verification measurements to demonstrate compliance with planning condition 17 under 138820/JO/2023. This report sets out relevant information to discharge the condition.

Sample noise measurements were undertaken on site on 9 and 16 December 2025, with further measurements on 14 April 2026 to verify noise levels from the installed plant in operation. The measurements and subsequent assessment indicate that noise egress exceeds the criteria at the commercial receptors to the north and west of the site. The kitchen extract fan unit at level 2 rooftop is the dominant source at these locations.

The day and night plant noise criteria are achieved at the Bauhaus apartments located to the east of the site.

It is recommended that the following mitigation measures are implemented to comply with plant noise egress criteria at nearby noise sensitive receptors:

- The KEF units should be housed within an acoustic enclosure, while maintaining adequate airflow to the KEF motor. Minimum insertion losses have been provided.
- Attenuation should be provided to the KEF exhaust. The minimum insertion losses have been set out, however, these may be reduced due to potential contributions from the KEF motor. This should be confirmed through further verification measurements following installation of the acoustic enclosure to determine whether the required attenuation could be reduced.

The installed KEF exhaust termination is currently located at approximately 2.5 m above the roof level, which provides a line of sight to the nearest noise sensitive premises to the north and west. There may be scope to reduce the attenuation requirements if the exhaust termination is located closer to the plant deck to maximise the acoustic screening provided. The exhaust ductwork geometry currently includes a steep transition section and elbow which may be introducing turbulence issues and non-laminar airflow, resulting in increased noise and less effective attenuation. This should be also adjusted/rectified.

The measurements of the smoke extract fan indicate compliance with the emergency plant noise criteria.

On the basis that the recommended additional mitigation measures are implemented, planning condition 17 can be discharged.

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1 Introduction

Sandy Brown has been appointed by Manchester Quays Developments (OGS) Ltd to carry out acoustic verification measurements to demonstrate compliance with planning condition 17 under 138820/JO/2023. This report sets out relevant information to discharge the planning condition.

Noise measurements were carried out on site on 9 and 16 December and 14 April 2026 for the installed and operational plant. The measurement results have been used as the basis of an updated 3D noise model to predict the levels outside the nearby receptors for comparison to the criteria set by Manchester City Council. Verification measurements have also been carried out outside the Bauhaus development.

Measurements of the emergency smoke extract fan have also been carried out.

Recommended mitigation measures have been given where plant noise is deemed to be non-compliant with the requirements of the condition.

2 Planning condition 17

Planning Condition 17 is split into two parts, a) and b), which states the following in regard to externally mounted plant:

a. *"Externally mounted ancillary plant, equipment and servicing for each phase (as identified on ZONE PLAN 180146-3DR-Z0-XX-DR-D112 REV A) other than Zone 6 and the hotel gymnasium, shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location. The scheme for each phase (as identified on ZONE PLAN 180146-3DR-Z0-XX-DR-D112 REV A) other than Zone 6 and the hotel gymnasium, shall be submitted to and approved in writing by the City Council as local planning authority prior to first occupation in order to secure a reduction in the level of noise emanating from the site."*

b. *Prior to first occupation of each phase (as identified on ZONE PLAN 180146-3DRZ0- XX-DR-D112 REV A) other than Zone 6 and the hotel gymnasium, a verification report to validate that the work undertaken throughout that phase of the development conforms to the recommendations and requirements in the scheme approved under point a. above, shall be submitted to and approved in writing by the City Council as local planning authority. The verification report shall include post completion testing to confirm that acceptable criteria has been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria and timescales for the implementation of those measures."*

3 The site and its surroundings

The proposed development is outlined in yellow in Figure 1.

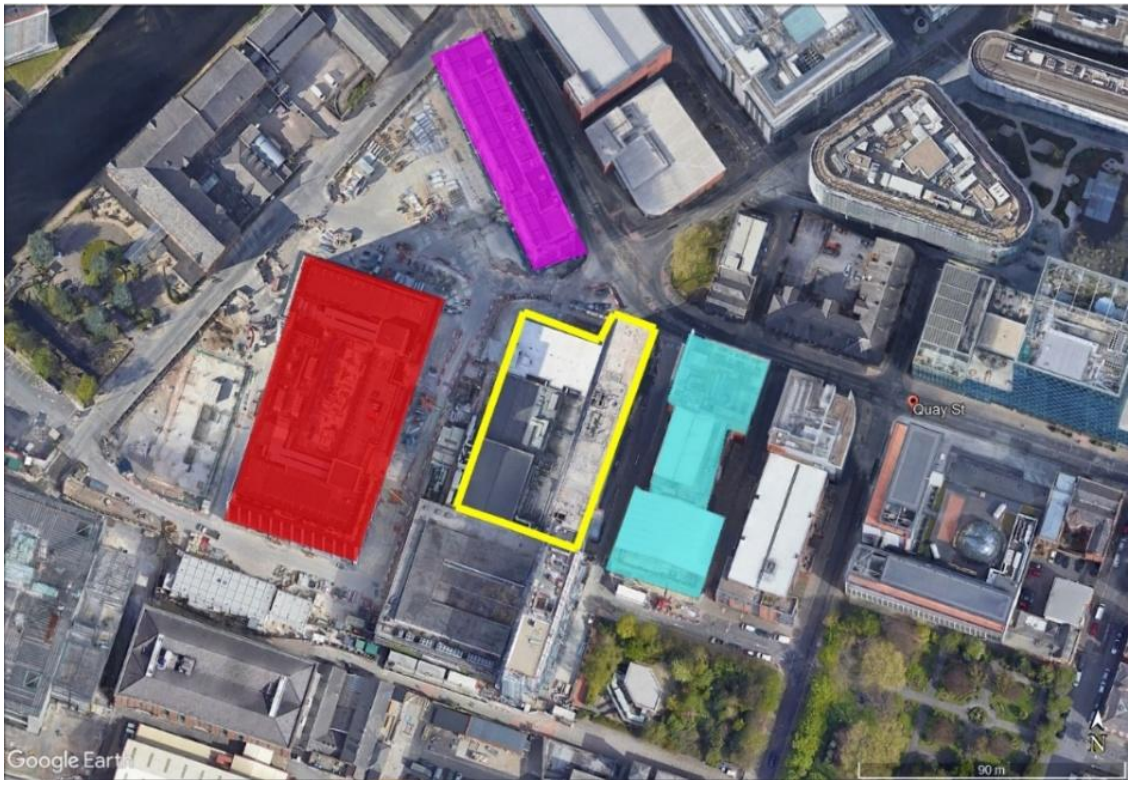


Figure 1 Site and its surrounding (courtesy of Google Earth Pro)

To the west of the site, the nearest affected receptor is Manchester Goods Yard highlighted in red in Figure 1. Globe and Simpson is located to the north of the site highlighted in pink in Figure 1. These comprise of commercial office premises and are therefore considered to only be a noise sensitive receptor during the day (07:00-23:00).

To the east of the site, the nearest affected receptor is Bauhaus. This is a residential receptor, highlighted in blue in Figure 1. This receptor is noise sensitive during the day (07:00-23:00) and at night (23:00-07:00).

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4 Plant noise egress limits

4.1 Background noise levels

An environmental noise survey has previously been undertaken at the site to determine the existing noise levels in the vicinity of the site and nearby noise sensitive premises. Full details of this survey can be found in Sandy Brown report 15037-R03-E *Acoustic planning report* dated 5 October 2020.

The representative background noise levels measured applicable to nearest noise sensitive receptors are set out in Table 1.

Table 1 Typical background noise levels at the nearest noise sensitive premises

Location	Typical background noise level, L_{A90} (dB)	
	Day (07:00-23:00)	Night (23:00 – 07:00)
Manchester Goods Yard (commercial)	51	50
Bauhaus apartments (residential) and Globe and Simpson (commercial)	51	45

4.2 Normally operating plant items

Plant noise egress limits at 1 m from the nearest noise sensitive premises for normally operating plant are provided in Table 2. These limits are in line with the requirements of Planning Condition 17 based on the background noise levels measured at the site..

Table 2 Plant noise egress limits for OGS development

Location	Plant noise egress limit at 1 m from window of nearby noise sensitive receptor, L_{Aeq} (dB)	
	Day (07:00 – 23:00)	Night (23:00 – 07:00)
Manchester Goods Yard (commercial)	46	45
Bauhaus apartments (residential) and Globe and Simpson (commercial)	46	40

4.3 Emergency plant

The emergency plant limits are provided in Table 3. These have been set to be no more than 10 dB above the background noise level based on the typical requirements of MCC.

Table 3 Emergency plant noise limits at 1 m from nearest noise sensitive premises

Time of day	Emergency plant noise egress limit at 1 m from window of nearby noise sensitive receptor, L_{Aeq} (dB)
07:00-23:00	61
23:00-07:00 (applicable at Bauhaus only)	55

4.4 Attention catching features

Corrections will need to be applied for any attention catching features in line with BS4142:2014.

5 Plant equipment

5.1 Equipment

5.1.1 Level 2 rooftop plant area

Screening has been provided around the perimeter of the plant area as well as a specialist acoustic screen with lid around 17 ODU units. The following plant equipment has been installed to the Level 2 rooftop:

- 6 x air handling units (AHUs)
  - AHU 02/03 (PFP A3-0450 2.4kW 400V-3F M6F7)
  - AHU 02/07 (unit model AH 1925-5050-FG-WP)
  - AHU 02/04 (PFP A3-0355 2.1kW 400V-3F M6F6)
  - AHU 02/01 (PFP A3-0500 4.1kW 400V-3F M6H5)
  - AHU 02/05(PFP A3-0315 1.5kW 400V-3F M6F8)
  - AHU 02/02 (PFP A3-0355 2.1kW 400V-3F M6F6)
- 17 x ODUs (condenser units).
  - ODU/LG/01 (Daikin REYQ14U)
  - ODU/00/01 (Daikin REYQ14U)
  - ODU/00/02 (Daikin REYQ10U)
  - ODU/01/01 (Daikin REYQ8U)
  - ODU/01/02 (Daikin REYQ8U)
  - ODU/01/03 (Daikin REYQ8U)

- ODU/02/01 (Daikin REYQ8U)
- ODU/02/02 (Daikin REYQ8U)
- ODU/03/01 (Daikin REYQ8U)
- ODU/03/02 (Daikin REYQ8U)
- ODU/04/01 (Daikin REYQ8U)
- ODU/04/02 (Daikin REYQ8U)
- ODU/05/01 (Daikin REYQ8U)
- ODU/05/02 (Daikin REYQ8U)
- ODU/06/01 (Daikin REYQ8U)
- ODU/06/02 (Daikin REYQ8U)
- ODU/LG/02 (Daikin RXM50R).

It should be noted that a specialist acoustic screen with a lid has been installed in this location.

- 2 x extract fans
  - 1 x KRD 500/4/80/50 A Rectangular Box Fan (EF 02 01)
  - 1 x GBD 630/4 T 120 (CENT) (EF 02 02A&B)
- 3 x intake atmosphere side connections
- 3 x exhaust atmosphere side connections.

5.1.2 Level 10 rooftop plant area

Acoustic screening has been provided around the perimeter of the Level 10 plant deck. The following plant equipment has been installed to the Level 10 rooftop:

- 5 x air handling units (AHUs):
  - AHU 10/01 (PFP A3-0450 2.4kW 400V-3F M6F7)
  - AHU 10/02 (PFP A3-0355 2.1kW 400V-3F M6F6)
  - AHU 10/03 (PFP A3-0450 2.4kW 400V-3F M6F7)
  - AHU 10/04 (PFP A3-0450 2.4kW 400V-3F M6F7)
  - AHU 10/05 (PFP A3-0500 4.1kW 400V-3F M6H5)
- 6 x ODUs (condenser units):
  - ODU/07/01 (Daikin REYQ8U)
  - ODU/07/02(Daikin RMX42R)
  - ODU/07/03 (Daikin RMX42R)

  - ODU/07/04 (Daikin RMX50R)
  - ODU/08/01 (Daikin REYQ24U)
  - ODU/09/01 (Daikin REYQ20U)
- 1 x ODU (condenser unit):
  - ODU/10/01 (no data received)
- 1 x extract fan:
  - 1 x GBD 560/4 T 120 (CENT) (EF 10 01)

5.1.3 Zone 5 ground level louvred areas

The following plant equipment has been installed to ground level louvred areas:

- 2 x boilers
- 3 x hot water heaters
- 2 x boosted cold water pumps
- 3 x sets of heat pumps
- Mitsubishi EP250 condenser unit.

6 Verification measurements

6.1 Method

Sample noise measurements were carried out on 9 December 2025 and 16 December 2025, additional plant sample noise measurements were carried out on 14 April 2026 to determine the noise levels produced by the installed and operational normally operating plant. Measurements were carried out in 1/3 octave bands over 30 second to 1 minute periods.

For each measurement, the microphone was located on a tripod approximately 1 m from each plant item/termination and approximately 1.5 m above the ground/roof.

Measurements were also carried out at the balcony of a level 10 Bauhaus residential apartment on Atherton St, with all plant fully commissioned and in operation. These measurements were carried out on 13, 16 and 17 March 2026, further comments are provided in Section 6.3

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

6.2 Weather conditions

Weather conditions during the measurements on 9 and 16 December 2025, and 14 April 2026 clear and dry and considered suitable for obtaining representative measurements.

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6.3 Measurement results

Plant noise measurement results are set out in Table 4. Observations for each measurement are provided. Plant noise was noted to be the dominant noise source in all cases. No attention catching features, with reference to BS4142 were noted during the measurements.

Table 4 Plant measurement results

Test ref	Sound pressure level measured, L_{Aeq} (dB)	Notes
1	61	Dominated by AHU 10.05
2	63	Noise egress from ductwork noted to be dominant
3	66	Noise egress from ductwork noted to be dominant as well as AHU breakout
4	60	Dominated by AHU 10.02
5	69	Dominated by AHU 10.02 exhaust termination
6	65	Dominated by ODU/07/02 unit (December 2025)
6	63	At 1 from plant side, dominated by plant operation with contributions from AHU10/03 (14 April 2026)
6B	65	At 1 m above the plant unit, dominated by plant operation with contributions from AHU10/03(14 April 2026)
7	69	As above (December 2025)
7	62	At 1 from plant side, dominated by plant operation with contributions from AHU10/03 (14 April 2026)
7B	58	At 1 m above the plant unit, dominated by plant operation with contributions from AHU10/03(14 April 2026)
7C	62	At 1 from plant side, dominated by plant operation with contributions from AHU10/03 and AHU/10/01 (14 April 2026)
7D	60	At 1 m above the plant unit, dominated by plant operation with contributions from AHU10/03 and AHU/10/01 (14 April 2026)
8	68	Contributions were noted from AHU/10/01 and AHU/10/03 as well as from ODU/07/02(December 2025)

Test ref	Sound pressure level measured, L_{Aeq} (dB)	Notes
9	66	Dominated by contributions from AHU/10/03 exhaust
10	64	Dominated by contributions from AHU/10/04 exhaust
11	61	No dominant noise sources noted.
12	65	Dominated by AHU/02/02 exhaust termination
13	65	
14	60	Dominated by AHU/02/02 case breakout with some contributions from exhaust termination
15	59	
16	58	Dominated by AHU/02/02 case breakout with some contributions from exhaust termination
17	63	Dominated by AHU/02/05 exhaust termination with some contribution from AHU/02/01 exhaust termination
18	63	
19	62	Dominated by AHU/02/05 case breakout with some contribution from AHU/02/01 exhaust termination
20	62	
21	60	Dominated by AHU/02/05 case breakout with some contribution from AHU/02/01 exhaust termination
22	61	
23	66	Dominated by AHU/02/01 exhaust termination
24	66	
25	62	Dominated by AHU/02/01 exhaust termination
26	62	
27	61	Dominated by AHU/02/01 case breakout with some contribution from AHU/02/01 exhaust termination
28	61	
29	66	Dominated by AHU/02/04 exhaust termination
30	66	
31	62	Dominated by AHU/02/04 case breakout with some contribution from AHU/02/04 and AHU/02/01 exhaust terminations
32	63	Dominated by AHU/02/04 case breakout with some contribution from AHU/02/04 and AHU/02/01 exhaust terminations

Test ref	Sound pressure level measured, L_{Aeq} (dB)	Notes
33	66	Noted to have contributions from both ODU/LG/02 as well as AHU units on plant deck.
34	69	Dominated by AHU/02/03 exhaust termination with significant contribution from ODU units surrounding AHUs
35	77	Dominated by AHU/02/07 and AHU/02/03 exhaust termination with significant contribution from ODU units surrounding AHUs
36	77	Dominated by AHU/02/07 and AHU/02/03 exhaust termination with significant contribution from ODU units surrounding AHUs
37	77	Dominated by extract fan motor termination and case breakout N+1 configuration
38	77	
39	65	Significant contributions were noted from both KEF and AHU/02/03
40	65	
41	59	No individual plant items noted to dominate in this position
42	59	
43	61	No individual plant items noted to dominate in this position
44	61	
45	60	No individual plant items noted to dominate in this position
46	59	
47	59	Some contributions audible from other side of louvre, however plant noise egress was barely audible at 1 m from ground level louvre
48	58	

In addition to the above, measurements were undertaken at the balcony of a level 10 Bauhaus residential apartment on Atherton St, with all plant fully commissioned and in operation.

These measurements were carried out between:

- 04:30- 05:30 and 07:20-07:40 on 13 March 2026
- 23:30 on 16 March 2026 to 00:30 on 17 March 2026
- 02:35 – 13:05 on 17 March 2026.

The measurement location is shown in Figure 2. The measurement results are summarised in Table 5.

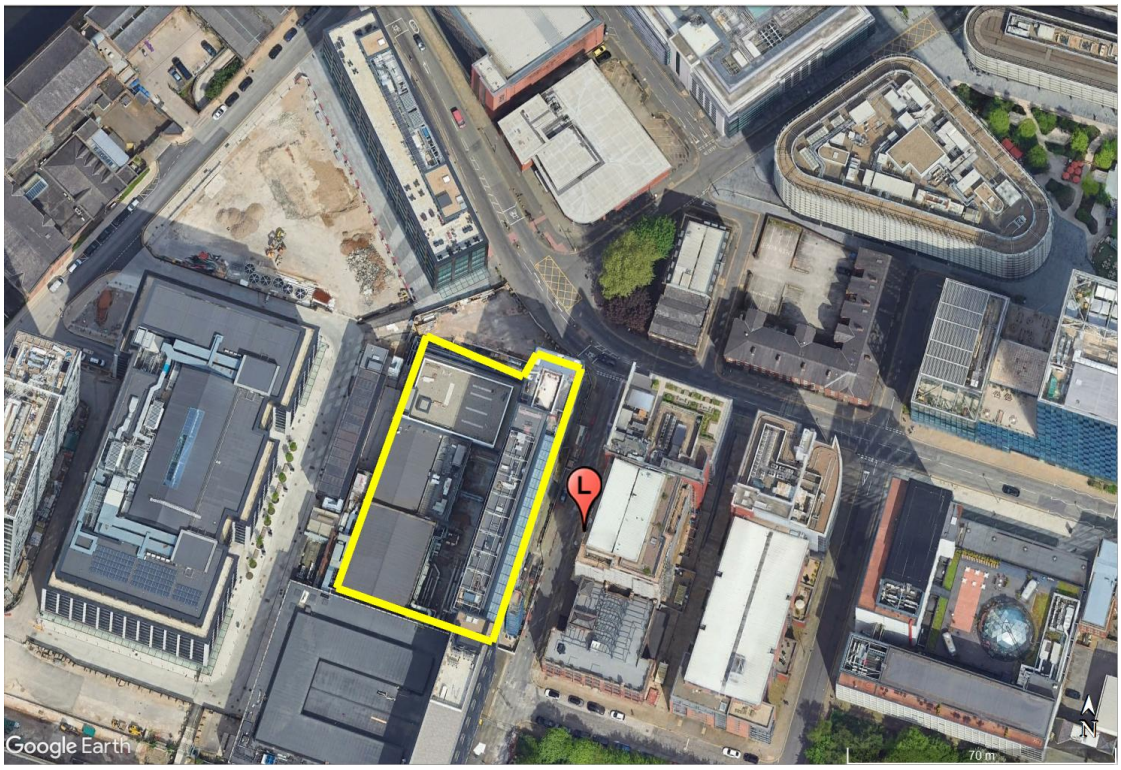


Figure 2 Site (outlined in yellow) and measurement position (courtesy of Google Earth Pro)

Figure 3 shows a photograph of the measurement location with respect to OGS.

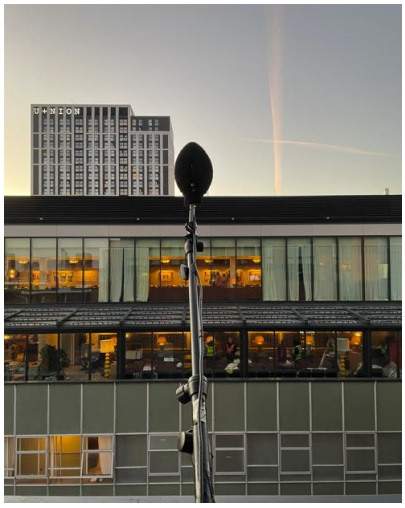


Figure 3 Photograph of the measurement position at level 10 residential balcony overlooking the development

The measurement location is indicated as L in Figure 2. The measurement results are summarised in Table 5. All measurements were dominated by road traffic on Quay Street with no plant noise audible at the receptor.

Table 5 Measurement results at level 10 Bauhaus apartment

Position	Start time	Sound pressure levels (dB)		
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$
13 March 2026				
L	04:30	52	68	47
	04:35	53	68	46
	04:40	53	68	47
	04:45	54	66	48
	04:50	52	60	48
	04:55	57	74	48
	05:00	55	67	48
	05:05	55	65	48
	05:10	53	64	49
	05:15	52	61	48
	05:20	55	69	49
	05:25	55	66	48
	05:30	55	65	49
	07:20	60	67	55
	07:25	59	65	55
	07:30	60	70	56
	07:35	61	72	55
	07:40	60	72	55
16 March 2026				
L	23:30	57	65	51
	23:35	56	65	51
	23:40	56	65	51
	23:45	56	63	51
	23:50	57	66	52

Position	Start time	Sound pressure levels (dB)		
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$
	23:55	55	71	51
17 March 2026				
L	00:00	57	68	52
	00:05	56	68	51
	00:10	56	65	50
	00:15	54	63	50
	00:20	55	67	50
	00:25	55	61	50
	02:35	52	61	46
	02:40	52	64	45
	02:45	50	58	45
	02:50	50	57	46
	02:55	52	62	45
	03:00	48	62	45
	03:05	53	69	47
	03:10	53	65	46
	03:15	54	73	47
	03:20	52	69	46
	03:25	51	65	45
	03:30	49	60	46
	03:35	52	66	46
	03:40	57	71	46
	03:45	49	59	46
	03:50	51	64	46
	03:55	50	61	45
	04:00	50	61	44
	04:05	50	60	45
	04:10	49	59	45

Position	Start time	Sound pressure levels (dB)		
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$
L	04:15	54	66	47
	04:20	55	68	46
	04:25	55	69	47
	04:30	53	64	45
	04:35	53	66	46
	04:40	52	69	46
	04:45	54	67	46
	04:50	53	63	47
	04:55	49	60	46
	05:00	54	66	47
	05:05	52	63	47
	05:10	53	67	48
	05:15	54	62	47
	05:20	55	66	49
	05:25	52	60	48
	05:30	53	62	48
	05:35	55	68	50
	05:40	55	62	51
	05:45	55	65	49
	05:50	56	63	51
	05:55	56	64	51
	06:00	56	63	51
	06:05	57	64	52
	06:10	58	64	53
	06:15	58	67	51
	06:20	58	68	52
	06:25	57	70	52
	06:30	57	67	52

Position	Start time	Sound pressure levels (dB)		
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$
L	06:35	58	66	53
	06:40	59	70	53
	06:45	59	68	54
	06:50	59	67	54
	06:55	59	65	55
	07:00	60	65	55
	07:05	59	69	55
	07:10	60	73	56
	07:15	60	72	55
	07:20	59	66	55
	07:25	58	69	55
	07:30	59	68	55
	07:35	61	79	55
	07:40	60	75	55
	07:45	59	70	55
	07:50	58	66	55
	07:55	59	65	55
	08:00	59	65	55
	08:05	64	81	56
	08:10	59	73	56
	08:15	59	70	55
	08:20	59	68	55
	08:25	59	66	55
	08:30	59	65	55
	08:35	63	71	59
	08:40	64	76	61
	08:45	64	73	61
	08:50	67	76	61

Position	Start time	Sound pressure levels (dB)		
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$
L	08:55	68	79	63
	09:00	67	79	62
	09:05	65	69	62
	09:10	65	70	61
	09:15	65	75	57
	09:20	66	78	63
	09:25	75	95	64
	09:30	65	72	62
	09:35	63	80	57
	09:40	67	74	64
	09:45	67	75	64
	09:50	69	73	67
	09:55	69	79	61
	10:00	66	77	61
	10:05	66	80	59
	10:10	68	72	64
	10:15	67	71	64
	10:20	68	71	65
	10:25	68	72	63
	10:30	75	94	65
	10:35	58	64	55
	10:40	59	66	55
	10:45	59	70	55
	10:50	60	73	55
	10:55	58	66	55
	11:00	59	71	56
	11:05	66	86	55
	11:10	58	70	55

Position	Start time	Sound pressure levels (dB)		
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$
L	11:15	58	68	56
	11:20	60	70	57
	11:25	59	64	56
	11:30	59	69	55
	11:35	58	68	54
	11:40	59	68	55
	11:45	59	66	55
	11:50	58	64	55
	11:55	58	66	56
	12:00	59	69	55
	12:05	58	68	55
	12:10	59	70	55
	12:15:	59	78	55
	12:20	58	68	55
	12:25	58	67	55
	12:30	58	66	55
	12:35	59	70	55
	12:40	61	82	56
	12:45	58	73	55
	12:50	58	74	55
	12:55	59	70	55
	13:00	59	72	56

7 3D noise modelling

A 3D environmental noise model of the site has been produced using the computational acoustic modelling package CadnaA (version 2026).

3D modelling has been used to predict the plant noise egress at the nearby noise sensitive premises for normally operating plant, based on the localised plant verification measurement results.

The modelling is based on both the noise data received and measurements carried out on site, and includes for the acoustic screening where installed. The model has been calibrated based on the measurements to predict plant noise egress levels at the worst affected noise sensitive receptors.

The software carries out calculations using a ray tracing technique, and considers the effects of topography, reflections, screening and distance attenuation for noise sources to predict noise levels in three dimensions. Calculations are carried out in accordance with ISO 9613 *Attenuation of sound during propagation outdoors*.

A screenshot of the model is presented below in Figure 4.

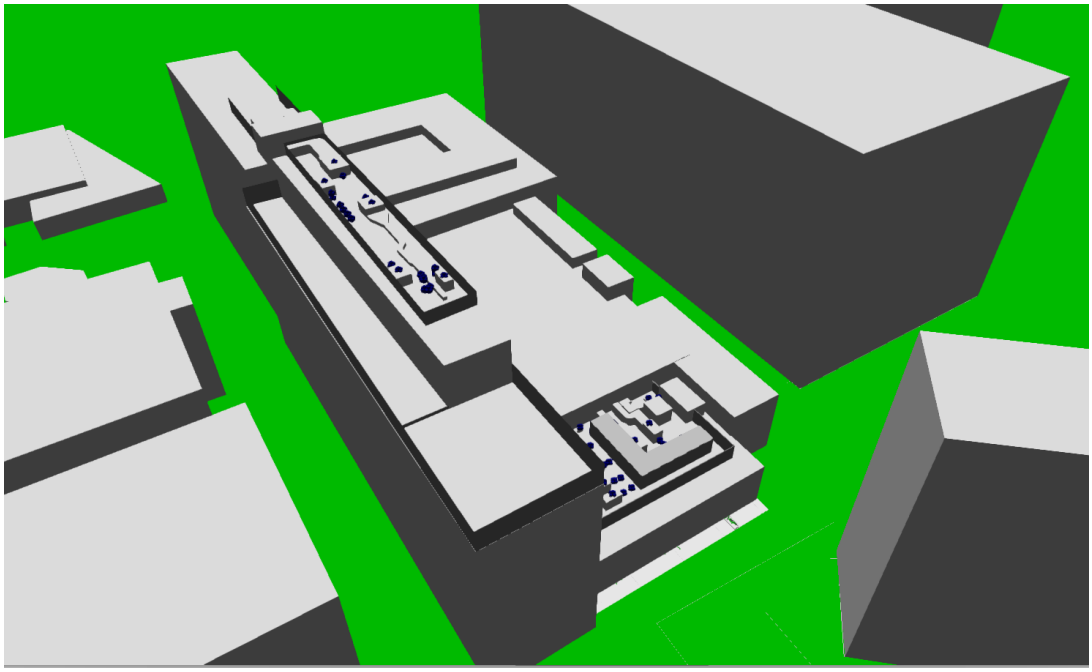


Figure 4 Screenshot of 3D environmental noise model

7.1 Results

The predicted plant noise egress levels outside the nearby noise sensitive receptors are provided in Table 6. The modelling has been based on the results of localised measurements close to the plant items.

Table 6 Predicted plant noise egress levels for OGS development based on measurements

	Plant noise criteria, L_{Aeq} (dB		Plant noise egress level, L_{Aeq} (dB)	
	Day (0700 – 2300)	Night (2300 – 0700	Day (0700 – 2300)	Night (2300 – 0700
Manchester Goods Yard	46	-	49	-
Globe & Simpson	46	-	53	-
Bauhaus Apartments	46	40	45	40

The plant noise egress levels meet the required criteria at the Bauhaus Apartments but exceed the required criteria at the commercial receptors. It is noted that the kitchen extract unit is the dominant source at these locations.

The verification measurements at level 10 of Bauhaus Apartments indicate that the background noise levels L_{A90} at night are reasonably consistent with those measured during the original noise survey (as presented in 15037-R03-E Acoustic planning report). The background noise levels measured during the day were slightly higher than those measured during the original survey. However, plant noise from the Old Granada Studios site was not audible at Bauhaus during the measurements and is predicted to be compliant based on the localised plant measurements and 3D modelling. As such, the increase in background noise during the day is expected to be due to increased activity and road traffic in the area. The ranges of background noise levels measured at position L are given below.

- L_{A90} 45-52 dB during the night
- L_{A90} 54-67 dB during the day.

7.2 Recommended mitigation measures

It is recommended that the following mitigation measures are implemented to control noise egress from the installed kitchen extract fan (Gigabox centrifugal fan) to the nearby noise sensitive receptors. A photograph of the installed kitchen extract fan is given in Figure 5.

The motor is located outside the airstream and connected to the atmosphere via a open mesh. During the measurements, this was subjectively the dominant noise source associated with the fan.

To control noise from the fan motor (and casing breakout), the kitchen extract fan unit should be housed within an acoustic enclosure capable of achieving the minimum insertion losses set out in Table 7. This will need to be designed to maintain adequate airflow to the motor.



Figure 5 Photo showing installed KEF

Attenuation is also recommended to the exhaust path to control contributions from the exhaust termination. The minimum insertion losses are also set out in Table 7. It should be noted that the measured noise levels at the exhaust termination may include contributions from the KEF motor ventilation opening. As such, the required insertion losses for the exhaust attenuator may be lower. However, this should be confirmed through further verification measurements to determine whether the specified attenuation can be reduced following installation of the acoustic enclosure.

Table 7 Recommended KEF –attenuation

	Minimum insertion losses, L_i (dB) Octave-band centre frequency (Hz							
	63	125	250	500	1k	2k	4k	8k
Exhaust path attenuator	4	19	15	13	13	10	4	2
Casing/motor enclosure	4	17	16	14	13	11	11	2

The insertion losses for the exhaust can typically be achieved by 1200-1500 mm long attenuator. The attenuator should be selected such that regenerate noise does not result in exceedance of the plant noise egress limits.

Example suppliers of attenuators and acoustic boxing are provided below:

- Environ – www.environ.co.uk
- Alloway - www.allawayacoustics.co.uk
- Wakefield - www.wakefieldacoustics.co.uk

The installed KEF ductwork configuration includes a transition and elbow, located immediately downstream of the fan. This may give rise to non-laminar air flow entering the attenuator, resulting in increased air turbulence, and increased noise as a result. Reconfiguration of this transition and elbow is recommended, as the attenuation requirements may reduce accordingly. Input from the MEP design team will be required to ensure the adequate ductwork length and suitably gradual transitions are incorporated.

Lowering the KEF exhaust termination such that the staircase overrun provides effective screening between the source and receiver could also reduce the attenuation requirements.

Further plant measurements are recommended once the mitigation measures have been implemented.

8 Emergency plant noise

8.1 Emergency plant

An emergency smoke extract fan has been installed with Zone D of the ground floor louvred plant area with the exhaust termination ducted within Zone C at high level, as highlighted in yellow and Green respectively in Figure 6. This is located at street level opposite the Bauhaus Apartments.

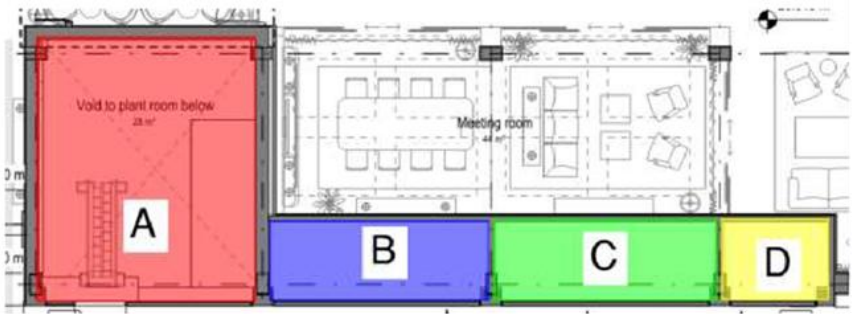


Figure 6 Ground floor louvred plant area

Complaints had previously been received from nearby residents at Bauhaus due to noise associated with the smoke extract system. Attenuation has since been installed to the smoke extract fan to mitigate noise egress.

Photographs of the installed smoke extract fan is provided in Figure 7.



Figure 7 Photographs of installed SEF unit Zone D (left), ducted exhaust Zone C (right)

8.2 Measurements of smoke extract fan noise emissions

8.2.1 Method

Attended measurements were undertaken on 14 April 2026 to determine the noise levels of the smoke extract fan and emergency plant noise egress to the nearby noise sensitive receptor.

Measurements were carried out in 1/3 octave bands over 1-minute periods. Extraneous noise was avoided for the duration of the measurements.

8.2.2 Weather conditions

Weather was clear and dry and considered suitable for obtaining representative measurements.

8.2.3 Results

Smoke extract fan measurement results are set out in Table 8. Observations for each measurement are provided. Smoke extract fan noise was the dominant noise source for all measurements.

Table 8 Smoke extract fan noise measurement results

Location	Measured sound pressure level, (dB), L_{Aeq}	Notes
Within louvre zone C, 1 m from SEF	74	Dominated by smoke extract fan breakout, noted to be heavily tonal at 50 Hz, though this is likely due to modal behaviour inside louvre zone C
Louvre zone C, centre of zone, 2 m from SEF	70	As above
1 m from external termination in louvre zone C- Exhaust	73	Dominated by extract termination
1 m from external termination in louvre zone D- Break out	68	Contributions from case radiation and distant exhaust
2 m from external termination in louvre zone C- Exhaust	69	Dominated by extract termination at high level
2 m from external termination in louvre zone D Break out	67	Contributions from case radiation and exhaust
10 m from louvre zone D, other side of Atherton Street	60	Dominated by SEF with distant contributions from road traffic
10 m from louvre zone D, other side of Atherton Street	59	As above with distant car slamming door
1.5 m from Bauhaus	58	SEF audible with equal contributions from road traffic on Quay St

The measurements indicate compliance with the emergency plant noise criteria during the day. The specific noise level from the SEF itself has calculated to be L_{Aeq} 55 dB outside the receptor and is therefore deemed compliant with the night criteria.

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SANDY BROWN
ACOUSTICS

Appendix A

Survey details

SANDY BROWN
ACOUSTICS

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 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.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a fast time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

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

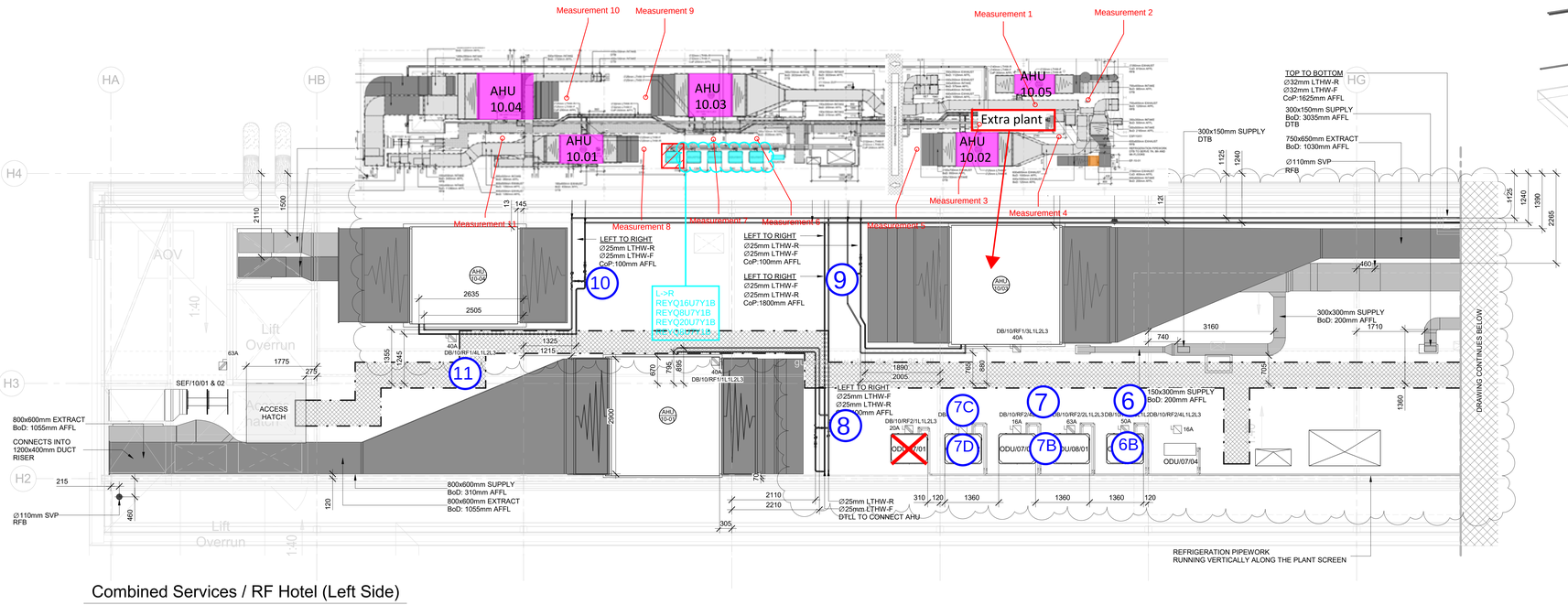
During the attended noise measurements, the weather was generally clear and dry and no rain occurred. Wind speeds were measured at each position and varied between 0 m/s and 2 m/s.

These weather conditions are considered suitable for obtaining representative measurements.

SANDY BROWN
ACOUSTICS

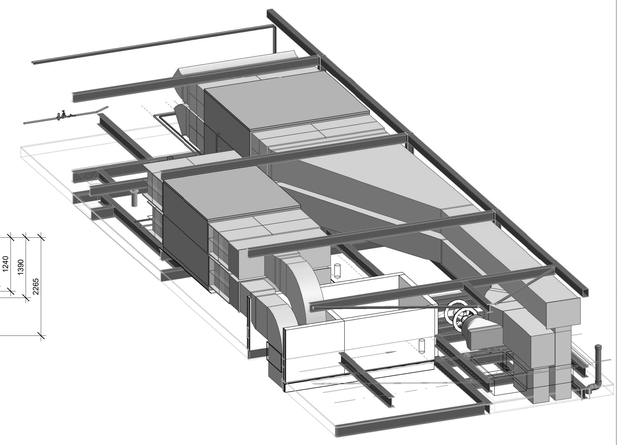
Appendix B

Measurements location mark-ups

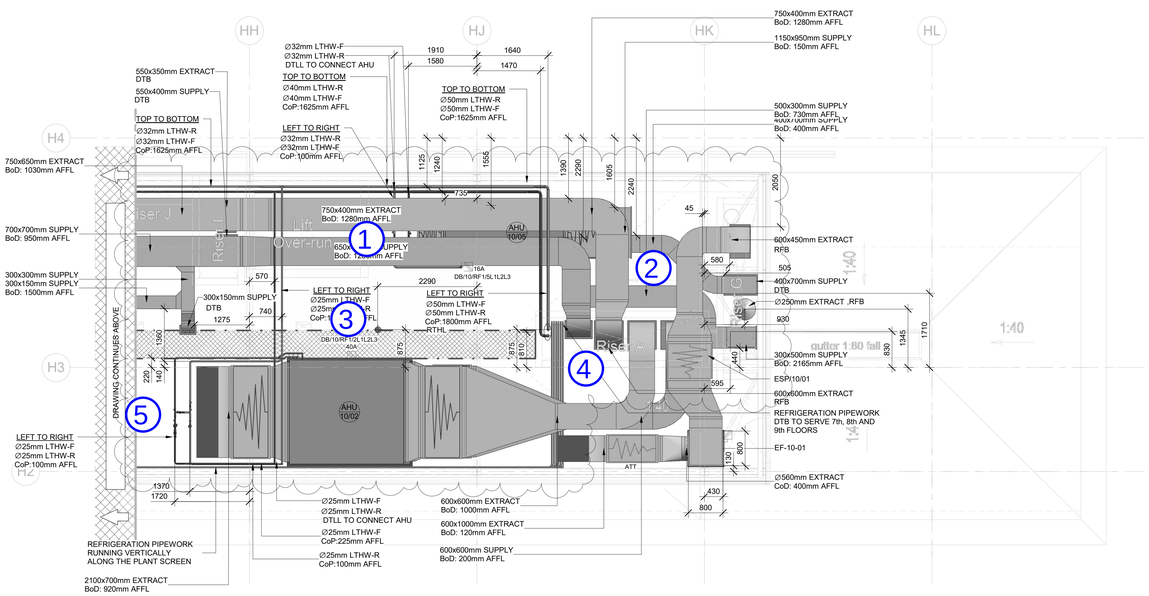


Combined Services / RF Hotel (Left Side)

1 : 50

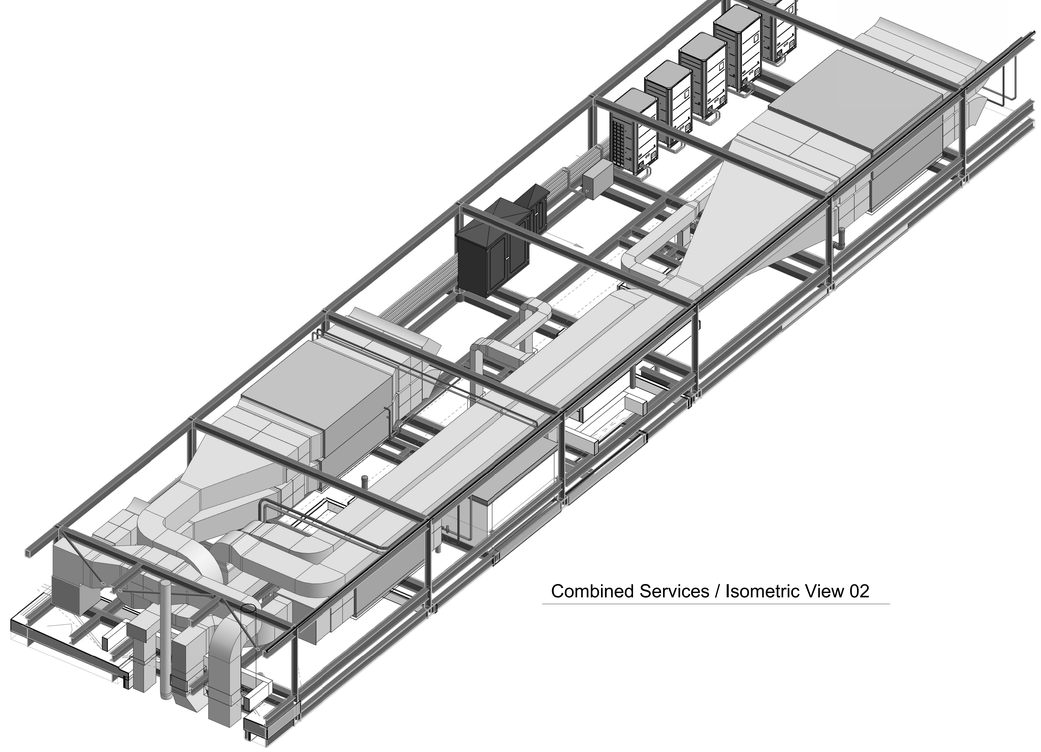


Combined Services / Isometric View 01



Combined Services / RF Hotel (Right Side)

1 : 50



Combined Services / Isometric View 02

0 1 2 MILLIMETER 10

LINEAR SCALE BAR

reference

drawing	rev	date	supplied

Keyplan

notes

Rev	Issued by	Description	Date
C5	JB	MINOR AMENDMENTS	21.12.23
C4	MM	MINOR AMENDMENTS	07.09.23
C3	ND	FOR CONSTRUCTION	15.08.23
C2	MM	FOR CONSTRUCTION	01.08.23
C1	MM	FOR CONSTRUCTION	02.06.23

status

FOR CONSTRUCTION

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ARJ CONSTRUCTION LTD

project

OLD GRANADA STUDIOS

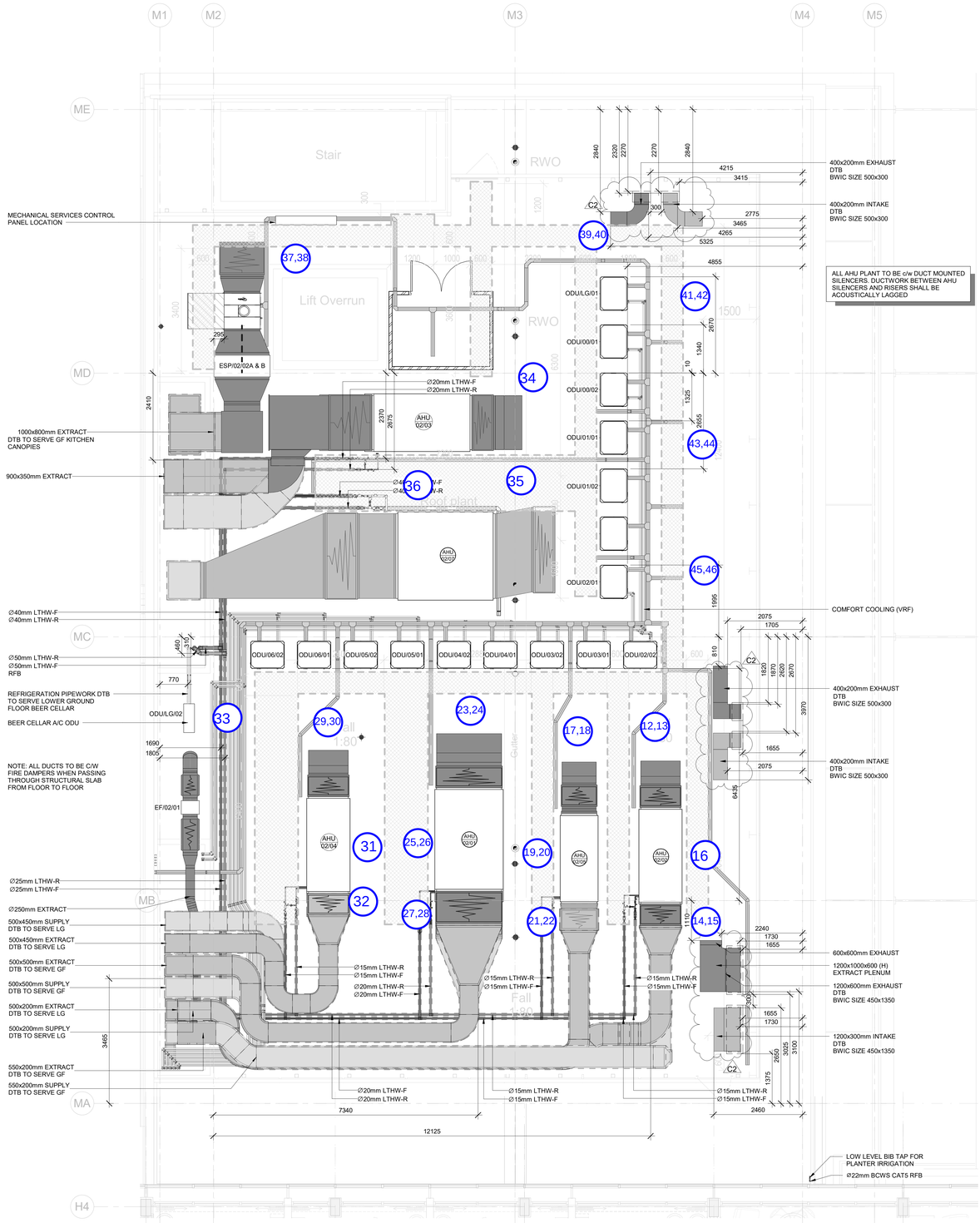
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MECHANICAL SERVICES
COMBINED SERVICES LAYOUT
ROOF LEVEL

drg no. 0765-VAU-ZZ-RL-DR-M-5101

drawn	MM	date	02.06.23	rev C5
checked	CWC	date	02.06.23	
scale	1 : 50	contract	765	

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Combined Services / 02 Floor (Plantroom)

1 : 50



Z4 Riser Section

1 : 50

02 Floor Plantroom / Isometric View

HRU Detail / Isometric View

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LINEAR SCALE BAR

reference

drawing	rev	date	supplied

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notes

Rev	Issued by	Description	Date
C2	MM	GYM VENTILATION ADDED	16.01.24
C1	MM	FOR CONSTRUCTION	02.06.23

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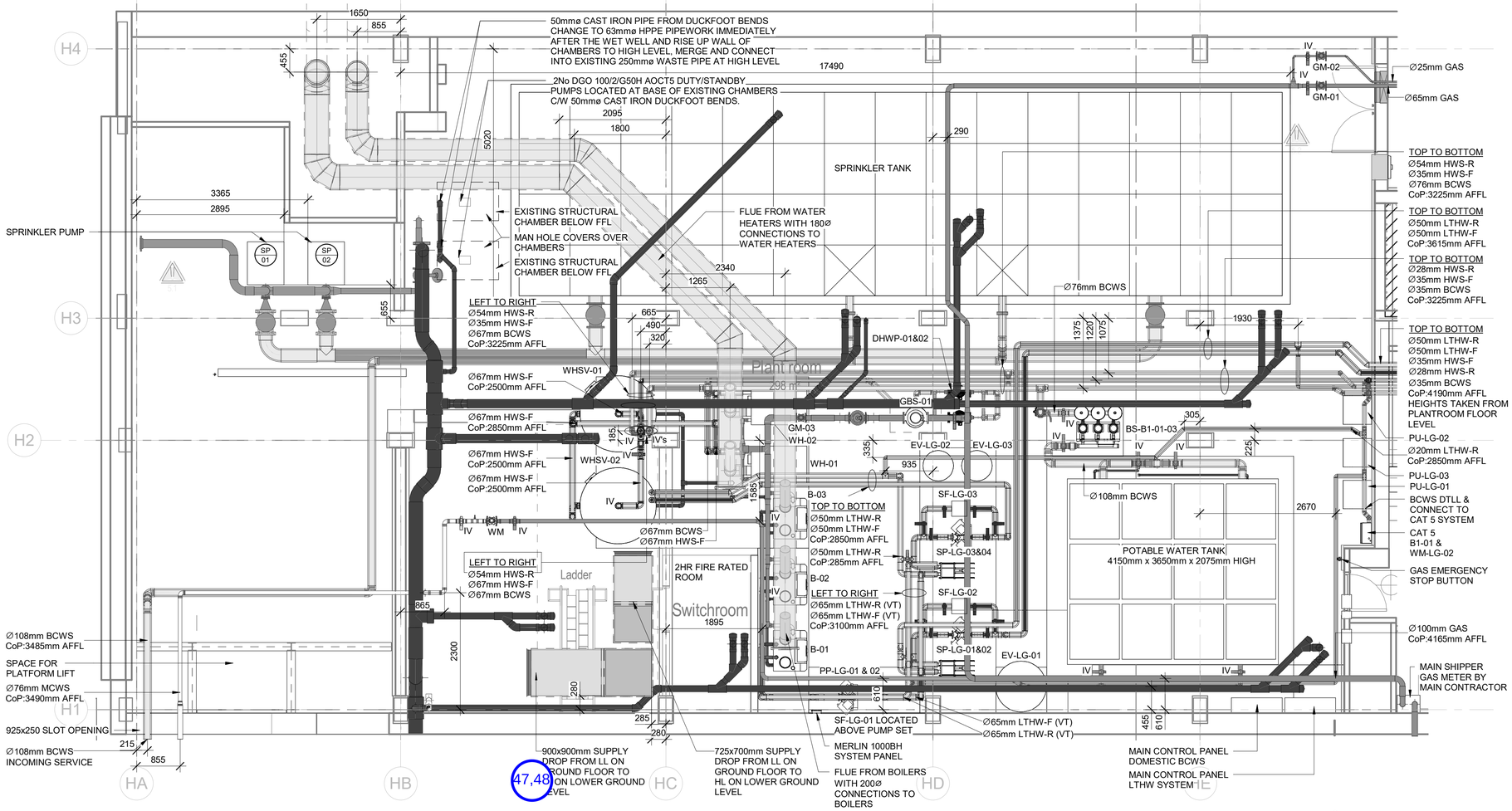
OLD GRANADA STUDIOS

drg title

MECHANICAL SERVICES
COMBINED SERVICES LAYOUT
SECOND FLOOR (PLANT)

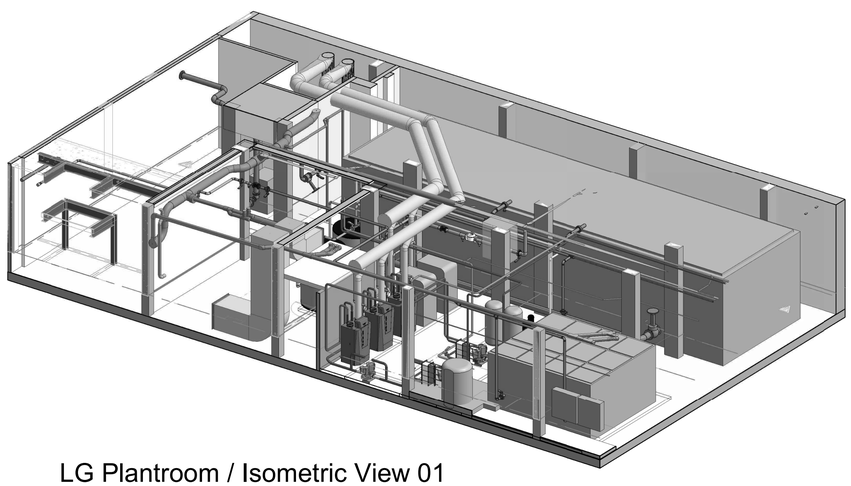
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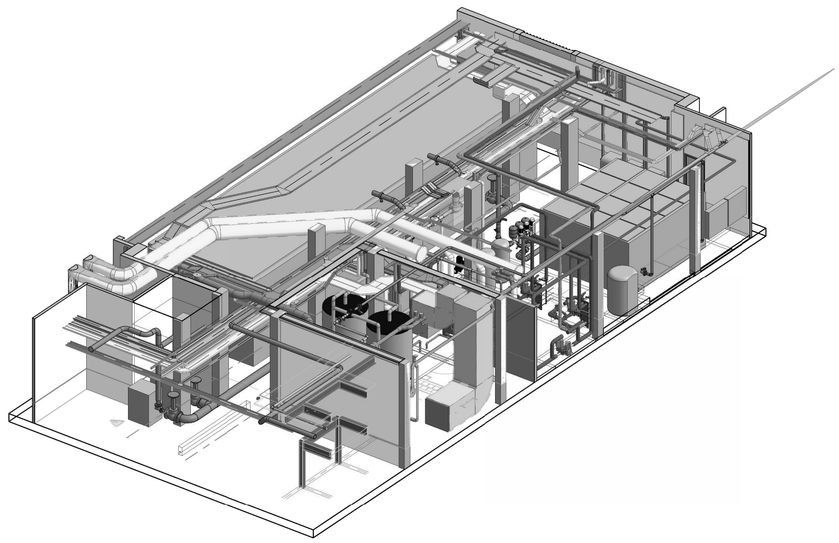


Combined Mechanical / LG Plantroom

1 : 50



LG Plantroom / Isometric View 01



LG Plantroom / Isometric View 02

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reference drawings

drawing number	rev	date	supplied by

Keyplan

notes

NOTE
ALL HEIGHTS SHOWN ON THIS DRAWING ARE TAKEN FROM PLANTROOM FLOOR LEVEL (790mm BELOW LG LEVEL).

Rev	Issued by	Description	Date
C2	MM	REDESIGNED LAYOUT	21.09.23
C1	MM	FOR CONSTRUCTION	02.06.23

status

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project

OLD GRANADA STUDIOS

drg title

MECHANICAL SERVICES
COMBINED SERVICES LAYOUT
LOWER GROUND FLOOR PLANTROOM

drg no. 0765-VAU-ZZ-LG-DR-M-5101

drawn	MM	date	02.06.23
checked	CWC	date	02.06.23
scale	1 : 50	contract	765

rev C2

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