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RESULTS OF A 24-HOUR NOISE LEVEL SURVEY CARRIED OUT ON THE ROOF OF THE OFFICE BUILDING LOCATED AT 24-32 STEPHENSON WAY, LONDON AND A REPORT ON THE NOISE CONTROL MEASURES REQUIRED TO MINIMISE THE NOISE IMPACT OF THE PROPOSED NEW EXTERNAL PLANT

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Client	:	Due West Ltd/ CBS Design Consultants Ltd
Project	:	24-32 Stephenson Way, London NW1
Emtec Ref.	:	QF8453/PF5564/RP1
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QF8453/PF5564/RP1

EMTEC PRODUCTS LTD.

RESULTS OF A 24-HOUR NOISE LEVEL SURVEY CARRIED OUT ON THE ROOF OF THE OFFICE BUILDING LOCATED AT 24-32 STEPHENSON WAY, LONDON AND A REPORT ON THE NOISE CONTROL MEASURES REQUIRED TO MINIMISE THE NOISE IMPACT OF THE PROPOSED NEW EXTERNAL PLANT

1.0. INTRODUCTION

This report details the results of a 24-hour noise survey carried out on the roof of the existing office building located at 24-32 Stephenson Way, London NW1.

The objectives of this survey were as follows:

- To assess the proposal to install new external plant on the roof of the building.
- To identify the nearest properties that might be affected by plant noise.
- To establish the existing background noise level outside the nearest affected properties.
- To recommend noise limits and any necessary measures to ensure that the operation of the new plant does not disturb the occupants of the nearest affected properties.

This report has been divided into the following sections for ease of analysis:

2.0. SITE DESCRIPTION

The property at 24-32 Stephenson Way consists of a front and back five storey building with a link block between these two main buildings to the left and a large open air space on the right between the two buildings. The buildings have been used as offices/storage space and the proposed development is to use the front building as offices complete with Air Conditioning and convert the rear building into residential flats.

3.0. TEST INSTRUMENTATION

All measurement equipment used during the survey complied with the requirements of BS4142:2014 "Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas". Details of the equipment are as follows:

Integrating Sound Level Meter:	Rion type NL-52 class 1 Sound Level Meter fitted with a Rion type UC-59 ½ inch condenser microphone.
Statistical Analysis Modules:	Built in module capable of computing the percentile levels L1, L10, L50, L90 and L99 and also the Leq level.
Acoustic Calibrator:	Bruel & Kjaer type 4231 electronic calibrator. Serial No.: 1934160

Calibration was performed before and after the surveys and found to be, in all cases, +/- 0.1 dB from the reference source.

3.1. Existing Noise Climate

Road traffic travelling on nearby North Gower Street and on the Main Euston Road could be heard during the manned periods at the start and the end of the survey, so the noise levels measured will include contributions from road vehicles.

Commercial jet aircraft were observed at relatively low altitude as the building is on the flight path into Heathrow and noise from aircraft was clearly heard during the manned periods at the start and the end of the survey. The noise levels measured will therefore include contributions from low altitude jet aircraft.

Euston Station is to the rear right of the building at approximately 200-300 metres distance. Train noise could not be distinguished when setting up the equipment but some contributions to the background noise could be made from train noise.

Construction work on the site was being carried out during the daytime so noise levels will be uplifted during the day due to the noise from these works.

The attached Photo A shows the front elevation of the front building which faces onto Stephenson Way and Photo B is on aerial view of the site with the front and rear building clearly indicated.

4.0. TEST PROCEDURE

The survey was conducted during a continuous 24-hour period from 10:15am on Monday the 19th of October 2015 to 09:30am on Tuesday the 20th of October 2015.

Data was continuously acquired throughout the measurement period with the individual averaging time for statistical noise data set to 15 minutes. The following 'A' weighted statistical measurements were recorded concurrently: -

LA_1 - The Sound Pressure Level exceeded for 1% of the measurement period.

LA_{10} - The Sound Pressure Level exceeded for 10% of the measurement period.

LA_{50} - The Sound Pressure Level exceeded for 50% of the measurement period.

LA_{90} - The Sound Pressure Level exceeded for 90% of the measurement period. LA90 is considered to represent the "background noise level" during the measurement period and is used for the assessment of noise to determine the likelihood of complaints (See BS 4142:2014).

LA_{99} - The Sound Pressure Level exceeded for 99% of the measurement period.

LA_{eq} - The continuous steady state Sound Pressure Level that has the same acoustic energy as the real fluctuating level.

4.1. Measurement Positions

Noise levels were measured at a location on the roof of the front building adjacent to the sloping roof at the right hand side. The microphone location is mounted on the attached aerial Photo B.

The microphone was pointing vertically and was approximately 1.2 metres above the roof level. The rest of the measurement equipment was located in a weatherproof enclosure with a low impedance cable running from the microphone to the instrumentation.

4.2. Weather Conditions

The weather conditions prevailing during the measurement period were generally in line with those recommended in BS 4142:2014: -

Weather daytime: -	Dull & overcast	Weather night time: -	Cloudy
Wind daytime: -	Light	Wind night time: -	Calm

The microphone was protected throughout the tests by an acoustically transparent wind balloon.

5.0. RESULTS AND EVALUATION OF NOISE CRITERIA

The raw test data, gathered during the noise survey, is given in Appendix 'A 'of this report.

The 'A' Weighted Leq levels measured over each 15 minute interval throughout the 24-hour period (denoted by LA_{eq}, (15 mins)) are displayed as a line graphs on the attached Sketch No QF/8453/T1 at the back of this report.

The 'A' Weighted percentile levels measured over each 15 minute interval denoted by LA_{10} (15 mins), LA_{50} (15 mins) and LA_{90} (15 mins) are displayed as line graphs on the attached Sketch No QF/8453/T2 at the back of this report.

5.1. Summary of Results

The table QF/8453/D1 below summarises the noise levels taken over the 24-hour period in terms of the maximum and minimum Sound Pressure Levels recorded.

Table QF/8453/D1 – Summary of Maximum and Minimum Noise Levels

	LA_{eq}	LA_{1}	LA_{10}	LA_{50}	LA_{90}	LA_{99}
Minimum	58.3dBA	59.1dBA	58.9dBA	58.2dBA	57.6dBA	57.4dBA
Maximum	64.2dBA	66.3dBA	66.3dBA	63.7dBA	63.3dBA	63.2dBA

5.2. Summary of the Local Authority's planning requirements regarding noise for noise sensitive properties

Section 16.34 of Camden's Noise Strategy 2002 states:-

The Council considers that for new developments involving noisy plant/equipment or other uses, design measures should be taken to ensure that noise levels predicted at a point 1 metreexternalto sensitive facades are at least 5dB(A) less than the existing background measurement (LA90) when the equipment is in operation. Where it is anticipated that equipment will have a noise that has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or if there are distinct impulses in the noise (bang, clicks chatters, thumps), special attention should be given to reducing the noise levels from plant and equipment at any sensitive façade to at least 10dB(A) below the LA90 level.

5.3. Determination of noise sensitive property design criteria

The new plant will not be intermittent or contain tones. Based on the local authority's planning requirements outlined above, the new plant should be designed to be 5dBA below the minimum existing LA_{90} background noise level during the relevant operational period.

It is proposed to operate the plant during normal extended office hours. However certain items of plant may operate on a 24 hour basis.

The lowest recorded LA_{90} level measured during extended normal office hours (8am to 10pm) was 57.7dBA and over the 24-hour period was 57.6dBA.

The new plant should therefore normally be designed to achieve 52.6 dBA at 1 metre from the nearest noise sensitive properties' windows if the externally located equipment is to be operated either over extended office hours or on a 24-hour basis.

However due to the background noise levels in the vicinity being high we would recommend that the plant be designed to not increase the background noise level when operating and would suggest that a noise level 10dB below the lowest LA90 background noise level should be used as the design criteria for the new plant.

5.4. Determination of commercial design criteria

The uses of the commercial premises that surround the development site generally consist of offices. It is therefore proposed that the recommendations given in BS8233:1999, Section 7.6 be considered.

	Good	Reasonable
Open plan office: $L_{Aeq,T}$	45dBA	50dBA

We propose that the lower of these rating levels is adopted, i.e. 45dBA.

Assuming a 10dB noise reduction due to a partially open window, as per the lower limit of the range given in BS8233:1999 section 8.4.7, the rating level at 1 metre external to the nearest affected office windows would be 45dBA + 10dB = 55dBA.

5.5. Summary of external noise criteria

Based upon the results of the survey and the above design criteria we summarise the actual design rating levels to be adopted for this project in table QF/8453/D2: -

Table QF/8453/D2 – recommended design rating levels $L_{Ar,T}$

Type of premises	$L_{Ar,T}$ (24-hour or extended office house (8am – 10pm)
Noise sensitive	47.6dBA
Commercial	55 dBA

6.0. DISCUSSION OF RESULTS

The plant that is to be located on the roof of the front building will be as indicated on the attached CBS drawing No.ME/1001(0) and consist of the Daikin air cooled condensers listed in table QF/8453/D3 below together with the natural attenuation to the nearest residential office window.

Table QF/8453/D3 – Noise Level of Condensers and Expected Attenuation to Nearest Residential Window

Equipment/Attenuation	Sound Pressure Level (dB ref 2 x 10^{-5} N/m^2) 63	125	250	500	1k	2k	4k	8k
Daikin REYQ30T2	59	66	60	62	53	50	44	37
(REYQ12T & REYQ8T)	61	58	58	57	52	47	48	37
Daikin REYQ20T	65	65	67	65	60	57	52	45
Daikin REYQ14T	66	68	64	59	54	50	47	39
Combined Free Field SPL	70	71	70	68	62	59	55	47
Reverberation of Adjacent building structures	+3	+3	+3	+3	+3	+3	+3	+3
Distance to residential façade in rear building -12 metres (10 log A_{11}/A_1)	-16	-16	-16	-16	-16	-16	-16	-16
Directivity of source to receiver	-2	-4	-6	+8	-8	-8	-8	-8
SPL at 1 metre from nearest neighbour's windows	55	54	51	47	41	38	34	26

The above spectrum is equivalent to 48.5dBA which is 0.9dB above the established noise criteria of 47.6dBA.

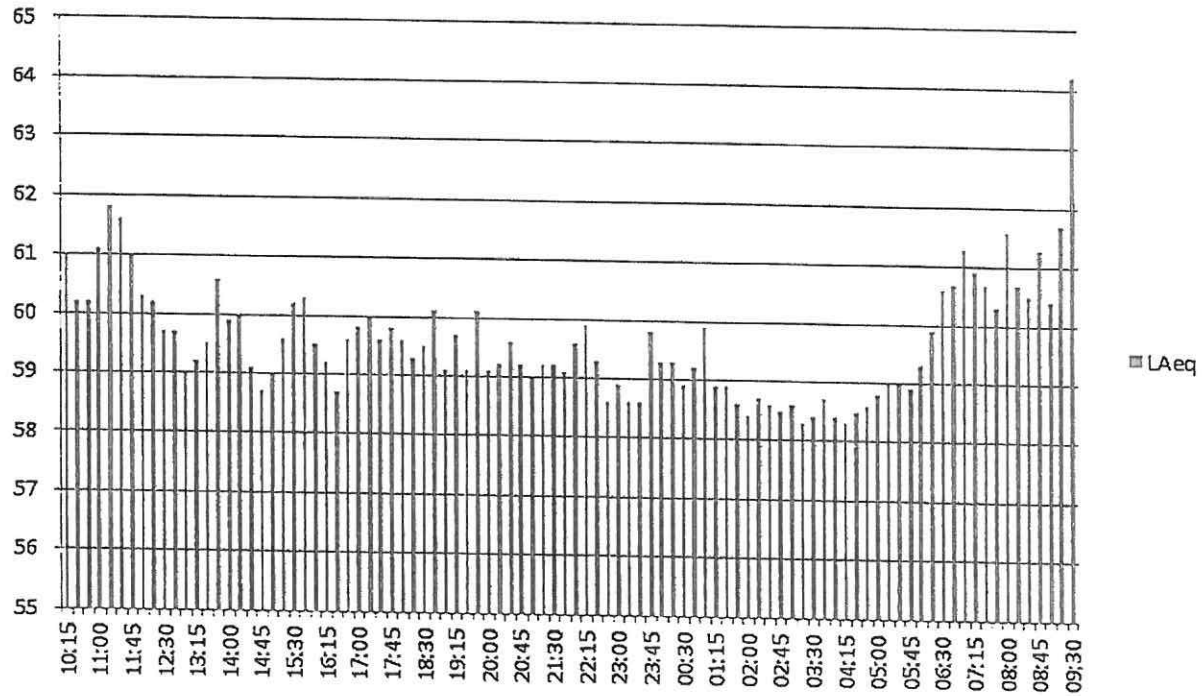
The table QF/8453/D4 shows the noise level of the condensers and the attenuation to the nearest office window in the front building.

Table QF/8453/D4 – Noise Level of Condensers and expected attenuation to nearest office window

Equipment/Attenuation	Sound Pressure Level (dB ref 2 x 10^{-5} N/m^2) 63	125	250	500	1k	2k	4k	8k
Combined Free Field SPL	70	71	70	68	62	59	55	47
Reverberation of adjacent building structures	+3	+3	+3	+3	+3	+3	+3	+3
Distance to nearest office window in front building – 5 metres (10log A_4/A_1)	-8	-8	-8	-8	-8	-8	-8	-8
Barrier effect of edge of building (500mm)	-8	-10	-12	-14	-17	-18	-20	-20
SPL at 1 metre from nearest office window	57	56	53	49	40	36	30	22

The above noise level is equivalent to 49.7dBA which is 5.3dB lower than the design rating level for 1 metre from the nearest office.

The noise levels produced by the roof mounted plant will therefore be acceptable to the office users in the front building and will only be 0.9dB higher than the established noise criteria at 1 metre from the flats in the rear building.



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CLIENT: O&C Management Ltd/CBS Design	PF No: 5564				APPROVED BY: MGR	REVISION							
PROJECT: 24-32 Stephenson Way, London	Q	A	M	I	DESIGN AUTH: MGR	SKETCH No. QF/8453/T1							

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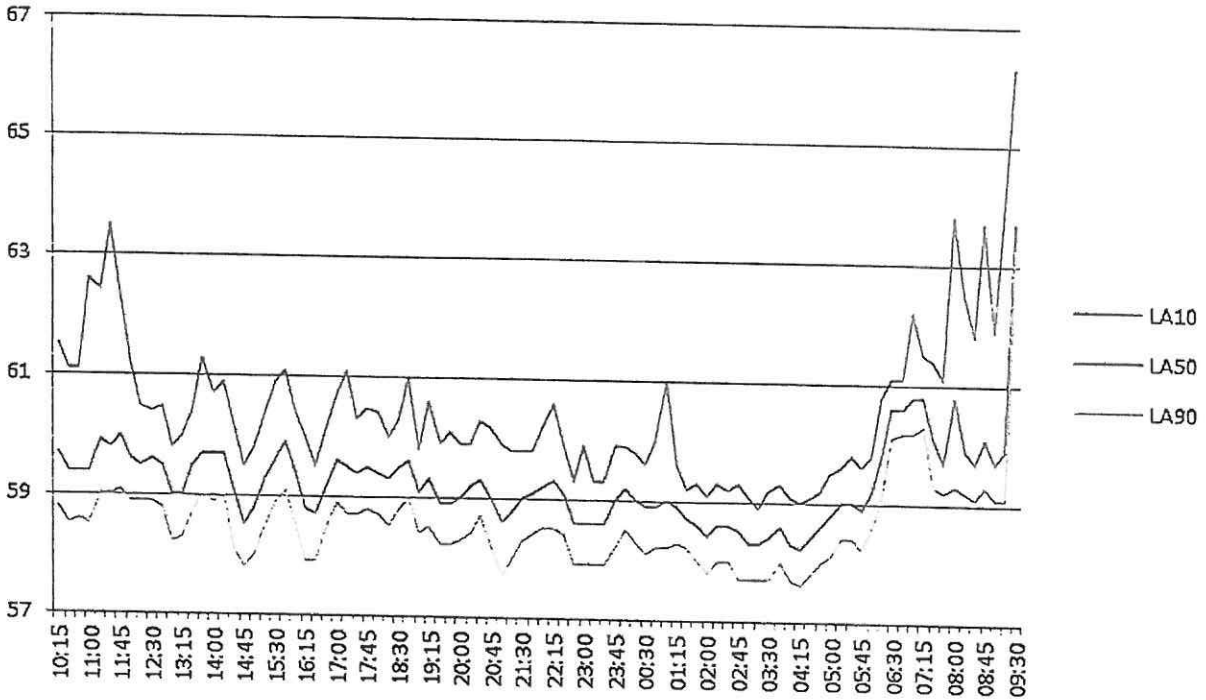

TITLE: LA10; LA50 & LA90 Levels	ISSUE DATE: 20/10/15				DRAWN BY: MGR	A	B	C	D	E	F	G	H	EMTEC
CLIENT: O&C Management Ltd/CBS Design	PF No: 5564				APPROVED BY: MGR	REVISION								Unit L, Turnpike Way, High Wycombe, Bucks, HP12 3TF
PROJECT: 24-32 Stephenson Way, London	Q	A	M	I	DESIGN AUTH: MGR	SKETCH No. QF/8453/T2								Tel: 020 8848 3031 Fax: 020 8573 3605

APPENDIX 'A'

Raw Data – Noise Survey

19th to 20th October 2015

RAW NOISE DATA - 24 to 32 Stephenson Way, London, NW1 2HD

Ref: QF8453/PF5564/RP1
Client: O&C Management Ltd/CBS Design Consultants
Date: 19th to 20th October 2015

Address	Start Time	LAeq	LE	Lmax	Lmin	LA1	LA10	LA50	LA90	LA99
1	10:15	61	90.6	83.1	57.6	62.9	61.5	59.7	58.8	58.6
2	10:30	60.2	89.8	84.3	57.2	62.4	61.1	59.4	58.5	58.3
3	10:45	60.2	89.8	74.1	57.1	62.6	61.1	59.4	58.6	58.4
4	11:00	61.1	90.7	74.3	57.2	65.1	62.6	59.4	58.5	58.3
5	11:15	61.8	91.4	85.3	57.6	64	62.4	59.9	59	58.7
6	11:30	61.6	91.2	78.8	57.5	66	63.5	59.8	59	58.9
7	11:45	61	90.6	73.3	57.9	64.5	62.3	60	59.1	58.9
8	12:00	60.3	89.9	73.6	57.9	62.5	61.2	59.6	58.9	58.8
9	12:15	60.2	89.8	74.7	57.6	61.7	60.5	59.5	58.9	58.7
10	12:30	59.7	89.3	66.3	57.6	60.8	60.4	59.6	58.9	58.7
11	12:45	59.7	89.3	67.8	57.2	61	60.5	59.5	58.8	58.5
12	13:00	59	88.6	64.5	56.3	60.2	59.8	59	58.2	58
13	13:15	59.2	88.8	67.5	57.1	60.5	60	59	58.3	58.1
14	13:30	59.5	89.1	72.3	57.4	60.7	60.4	59.5	58.7	58.5
15	13:45	60.6	90.2	73.9	57.1	62.8	61.3	59.7	59	58.8
16	14:00	59.9	89.5	68.1	57.1	61.2	60.7	59.7	58.9	58.8
17	14:15	60	89.6	71.5	57.6	61.5	60.9	59.7	59	58.8
18	14:30	59.1	88.7	66.6	56.2	60.6	60.2	59.1	58.1	57.8
19	14:45	58.7	88.3	67.1	56.5	59.8	59.5	58.5	57.8	57.6
20	15:00	59	88.6	66.7	56.5	60.6	59.8	58.8	58	57.8
21	15:15	59.6	89.2	67.9	57.2	61.3	60.4	59.3	58.5	58.3
22	15:30	60.2	89.8	74.4	57	61.5	60.9	59.6	58.9	58.6
23	15:45	60.3	89.9	70.4	57.9	62.1	61.1	59.9	59.1	58.9
24	16:00	59.5	89.1	65.9	56.8	60.9	60.4	59.4	58.5	58.3
25	16:15	59.2	88.8	71.8	56.6	60.8	60	58.8	57.9	57.7
26	16:30	58.7	88.3	65	56.2	59.8	59.5	58.7	57.9	57.6
27	16:45	59.6	89.2	70.4	57.1	61	60.2	59.2	58.5	58.3
28	17:00	59.8	89.4	67	57.6	61.4	60.7	59.6	58.9	58.6
29	17:15	60	89.6	69	57.2	62.2	61.1	59.5	58.7	58.4
30	17:30	59.6	89.2	66.9	57.6	60.8	60.3	59.4	58.7	58.5
31	17:45	59.8	89.4	71	57.4	61.1	60.5	59.5	58.8	58.6
32	18:00	59.6	89.2	66.5	57.4	61	60.4	59.4	58.7	58.5
33	18:15	59.3	88.9	65.2	57.2	60.2	60	59.3	58.5	58.3
34	18:30	59.5	89.1	67.5	57.5	60.7	60.3	59.5	58.8	58.6
35	18:45	60.1	89.7	69	58	62.2	61	59.6	59	58.8
36	19:00	59.1	88.7	63.4	57.2	60.1	59.8	59.1	58.4	58.3
37	19:15	59.7	89.3	68.3	57	61.6	60.6	59.3	58.5	58.3
38	19:30	59.1	88.7	67.4	56.6	60.6	59.9	58.9	58.2	58
39	19:45	60.1	89.7	75.4	57	61.2	60.1	58.9	58.2	58
40	20:00	59.1	88.7	66.5	56.8	60.4	59.9	59	58.3	58.1
41	20:15	59.2	88.8	65.7	56.6	60.3	59.9	59.2	58.4	58.1
42	20:30	59.6	89.2	68.1	57.1	60.8	60.3	59.3	58.7	58.4
43	20:45	59.2	88.8	65.8	56.7	60.8	60.2	59	58.2	58
44	21:00	59	88.6	69.9	56.4	60.9	59.9	58.6	57.7	57.5
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47	21:45	59.1	88.7	65.4	57	60.1	59.8	59.1	58.4	58.3
48	22:00	59.6	89.2	68.4	57.1	61.2	60.2	59.2	58.5	58.3
49	22:15	59.9	89.5	70.3	57.5	62.6	60.6	59.3	58.5	58.3
50	22:30	59.3	88.9	66.7	57.3	60.3	59.9	59.1	58.4	58.2

51	22:45	58.6	88.2	67.2	56.9	59.5	59.3	58.6	57.9	57.7
52	23:00	58.9	88.5	69	56.4	60.6	59.9	58.6	57.9	57.7
53	23:15	58.6	88.2	64.4	56.7	59.6	59.3	58.6	57.9	57.7
54	23:30	58.6	88.2	64.9	56.5	59.5	59.3	58.6	57.9	57.8
55	23:45	59.8	89.4	74.2	56.8	60.5	59.9	59	58.2	58
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58	00:30	58.9	88.5	64.5	56.9	59.8	59.6	58.9	58.1	58
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60	01:00	59.9	89.5	77.4	57	63.2	61	59	58.2	58
61	01:15	58.9	88.5	65.2	57.4	59.8	59.6	58.9	58.3	58.1
62	01:30	58.9	88.5	70.5	56.9	59.4	59.2	58.7	58.2	58
63	01:45	58.6	88.2	63.2	56.8	59.5	59.3	58.6	58	57.8
64	02:00	58.4	88	66.3	56.5	59.3	59.1	58.4	57.8	57.6
65	02:15	58.7	88.3	65.3	56.8	59.5	59.3	58.6	58	57.8
66	02:30	58.6	88.2	64.5	56.9	59.4	59.2	58.6	58	57.8
67	02:45	58.5	88.1	64.8	56.5	59.5	59.3	58.5	57.7	57.5
68	03:00	58.6	88.2	71.8	56.6	59.5	59.1	58.3	57.7	57.5
69	03:15	58.3	87.9	60.9	56.5	59.1	58.9	58.3	57.7	57.6
70	03:30	58.4	88	65.9	56.1	59.4	59.2	58.4	57.7	57.6
71	03:45	58.7	88.3	66.2	57	59.6	59.3	58.6	58	57.8
72	04:00	58.4	88	65.9	56.5	59.4	59.1	58.3	57.7	57.6
73	04:15	58.3	87.9	64.9	55.8	59.2	59	58.2	57.6	57.4
74	04:30	58.5	88.1	64.9	56.9	59.3	59.1	58.4	57.8	57.6
75	04:45	58.6	88.2	64.7	57.1	59.4	59.2	58.6	58	57.8
76	05:00	58.8	88.4	64.8	57.1	59.7	59.5	58.8	58.1	57.9
77	05:15	59	88.6	64	57.3	59.7	59.6	59	58.4	58.2
78	05:30	59	88.6	65.1	56.9	60.2	59.8	59	58.4	58.3
79	05:45	58.9	88.5	66	57.1	59.8	59.6	58.9	58.2	58
80	06:00	59.3	88.9	65.5	57.2	60.1	59.8	59.2	58.6	58.4
81	06:15	59.9	89.5	65.4	57.7	61	60.8	59.8	59.1	58.9
82	06:30	60.6	90.2	63.6	59.1	61.2	61.1	60.6	60.1	60
83	06:45	60.7	90.3	64.8	59.2	61.3	61.1	60.6	60.2	60.1
84	07:00	61.3	90.9	68.8	59.2	63.5	62.2	60.8	60.2	60.1
85	07:15	60.9	90.5	67.1	59.3	61.8	61.5	60.8	60.3	60.1
86	07:30	60.7	90.3	72.9	57.8	62.8	61.4	60.1	59.3	59.1
87	07:45	60.3	89.9	76.1	58.3	63.5	61.1	59.7	59.2	59.1
88	08:00	61.6	91.2	69.4	58.3	65	63.8	60.8	59.3	59.1
89	08:15	60.7	90.3	68.8	58.3	63.3	62.5	59.9	59.2	59
90	08:30	60.5	90.1	71.3	58.1	63.5	61.8	59.7	59.1	59
91	08:45	61.3	90.9	70.8	58.2	65.1	63.7	60.1	59.3	59.1
92	09:00	60.4	90	69.2	58	63.2	61.9	59.7	59.1	58.9
93	09:15	61.7	91.3	85.1	58.1	65	63.8	59.9	59.1	58.9
94	09:30	64.2	66.8	66.4	63.1	66.3	66.3	63.7	63.3	63.2

APPENDIX 'B'

Photos and sketches

24-32 Stephenson Way

Photo A – Front Elevation of 24-32 Stephenson Way Showing Existing Entrance & Windows

Site Boundary Proposed Plant Location Microphone location

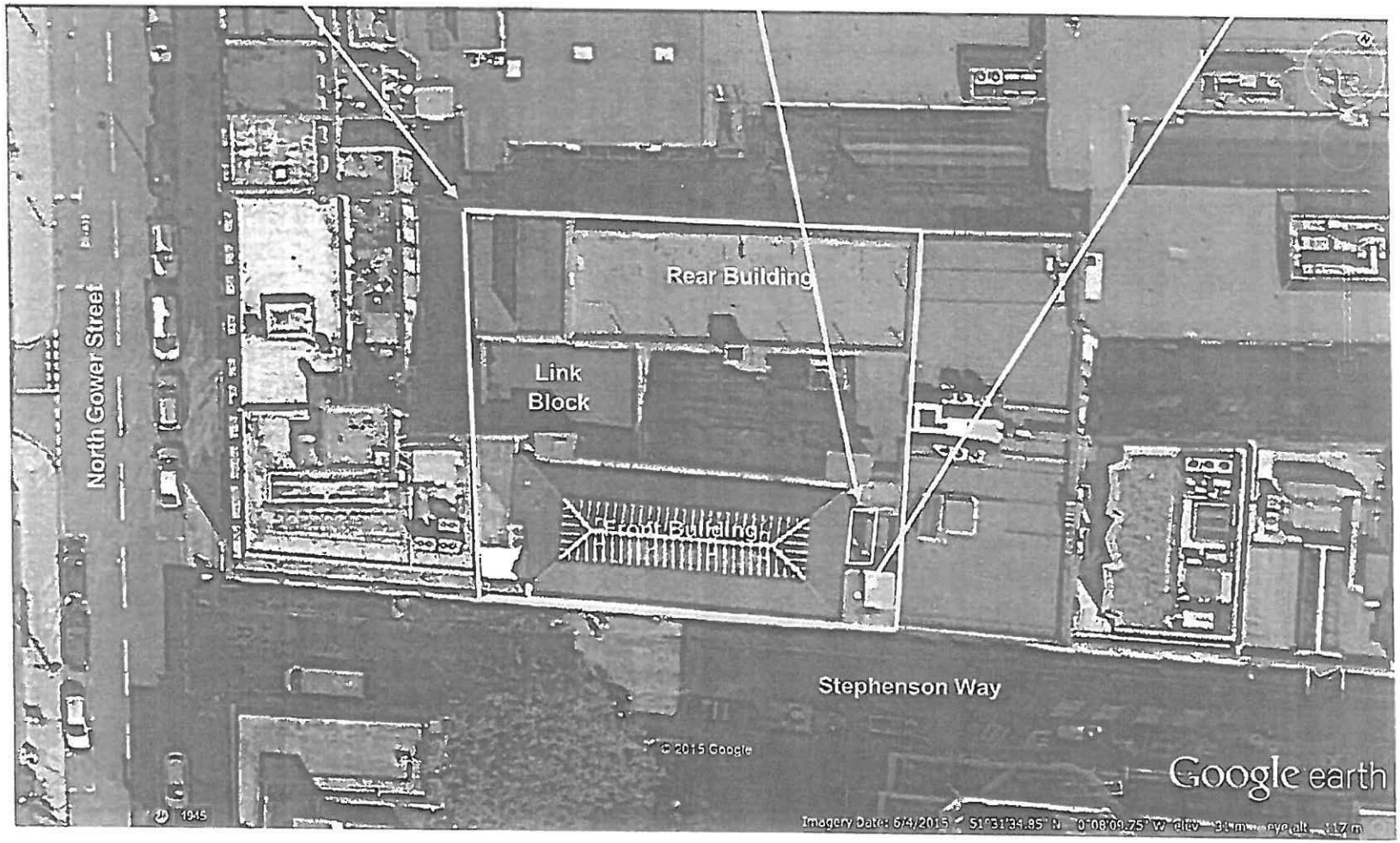


Photo B – Aerial View of Site Showing Two Buildings with Link Block & Proposed Location of Plant

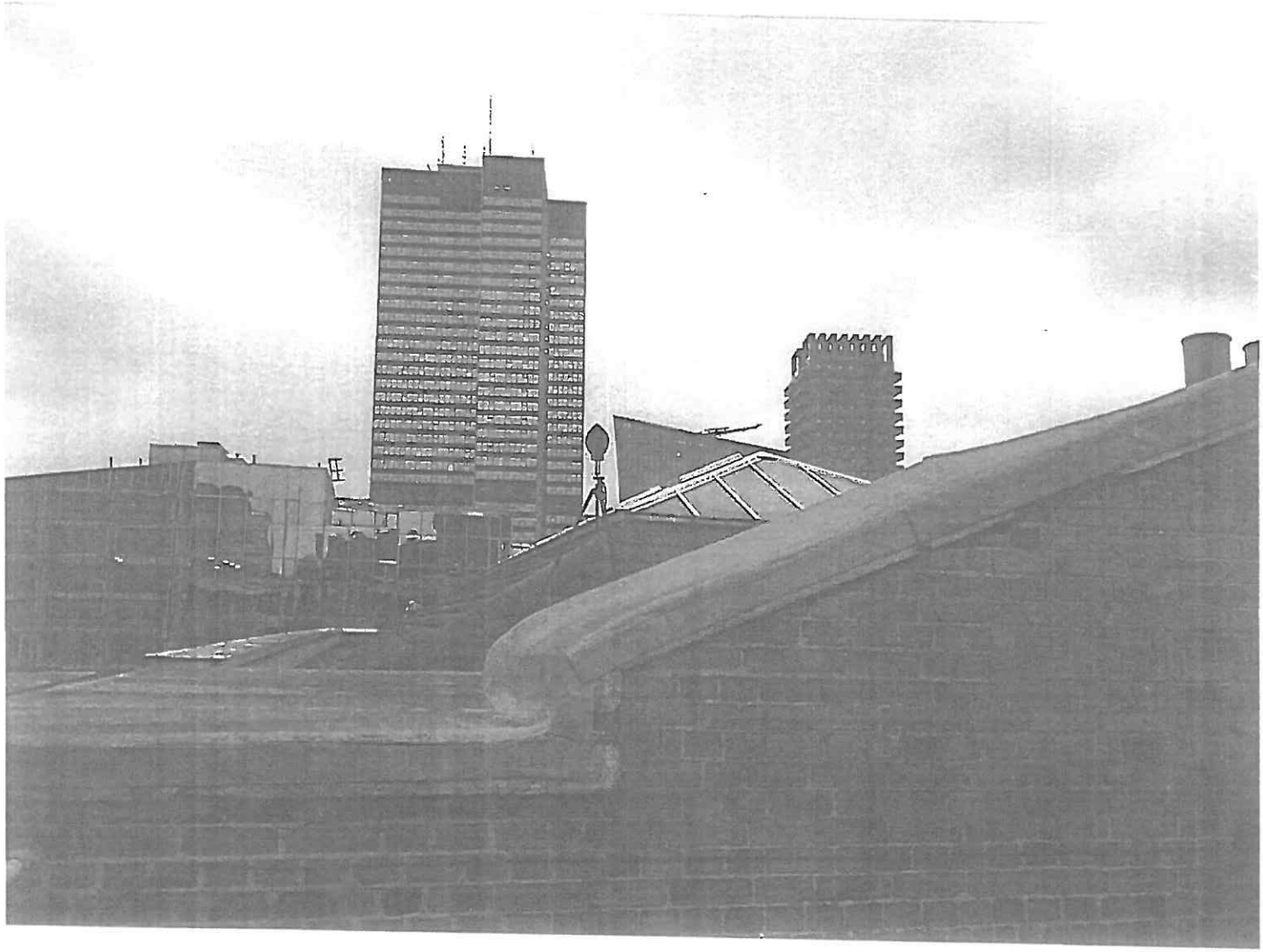
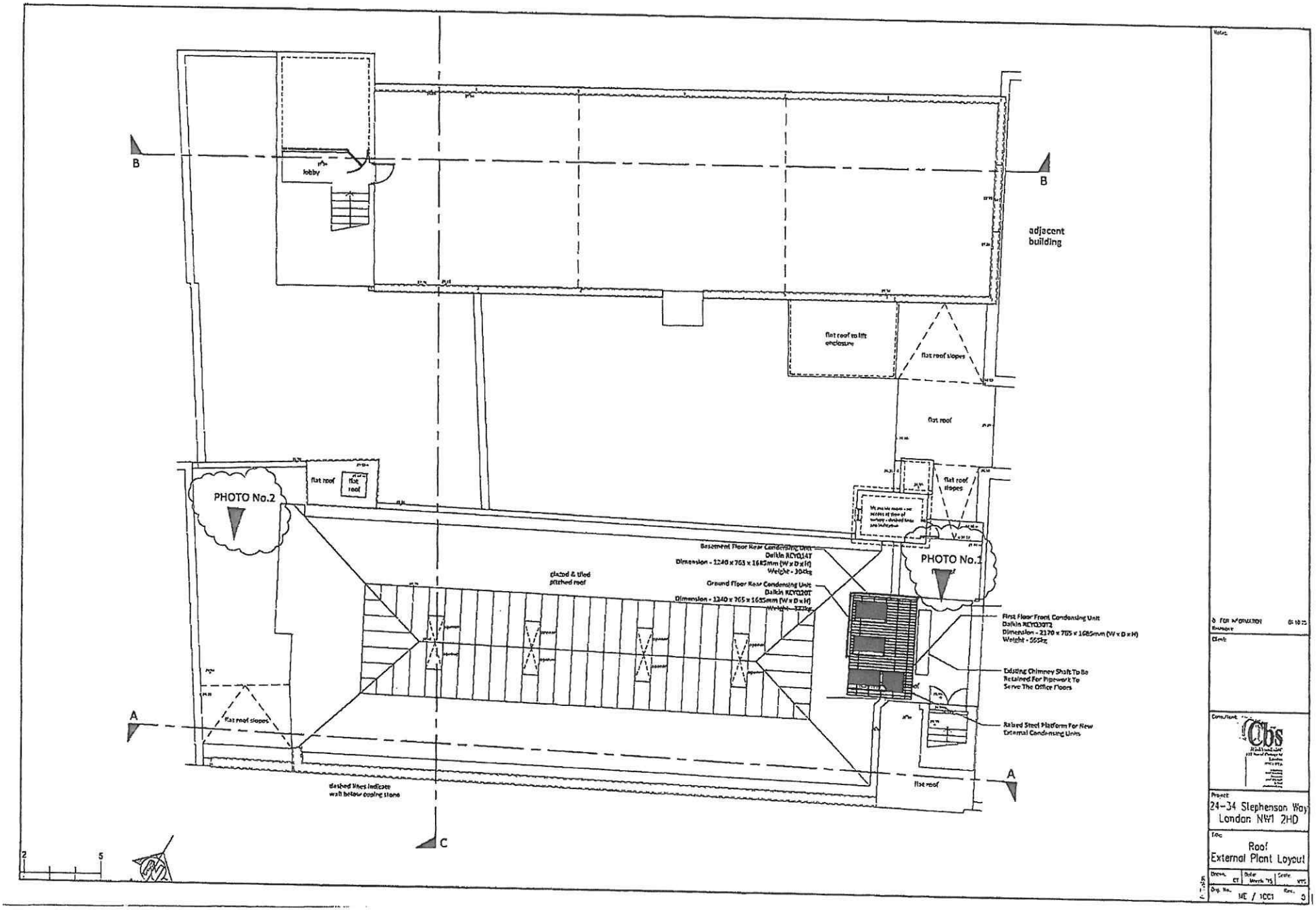


Photo C – Location of Microphone on Front Building Roof

Photo D – Location of Windows in Rear Building (Nearest Residential Properties)

Photo E – Location of Nearest Office Windows – One Floor Down From Plant Deck



Notes:

0 FOR INFORMATION 01.10.25

Client:

Consultant: CBS

Project:
24-34 Stephenson Way
London NW1 2HD

Title:
Roof
External Plant Layout

Drawn: CT | Date: March '25 | Scale: NTS

Drg. No.: ME / 1001 | Rev.: 0