RESULTS OF A 24-HOUR NOISE LEVEL SURVEY CARRIED OUT ON THE ROOF OF THE OFFICE BUILDING LOCATED AT 24-32 STEPHENSON WAY, LONDON NW1 AND A REPORT ON THE NOISE CONTROL MEASURES REQUIRED TO MINIMISE THE NOISE IMPACT OF THE PROPOSED NEW EXTERNAL PLANT

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Release by : I J Marchant

Client	:	Affinia Associates Ltd
Project	:	24-32 Stephenson Way, London NW1
Emtec Ref.	:	QF8453/PF6833/RP2
Issue Date	:	18th November 2020

RESULTS OF A 24-HOUR NOISE LEVEL SURVEY CARRIED OUT ON THE ROOF OF THE OFFICE BUILDING LOCATED AT 24-32 STEPHENSON WAY, LONDON NW1 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 at roof level of the office building located at 24-32 Strephenson Way, London NW1.

The objectives of the survey were as follows:

- To assess the proposal to install a new air cooled condenser in the light well at the rear of the building.
- To identify the nearest residential and commercial properties that might be affected by noise from the new plant.
- To establish the existing background noise level outside the nearest affected properties.
- To recommend noise limits and any necessary mitigating measures to ensure that the operation of the new plant does not disturb the occupants of the nearest affected properties and meets the planning directives of the local authority with regard to noise.

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 of the site. A large open light well space exists between the front and rear buildings.

The buildings are used as offices/laboratories and the proposed new condenser is an addition to a previously consented air conditioning condenser installation for the rear building. These condensers are located in a small light well at the rear right hand corner of the buildings. The building immediately behind the site is an office and the buildings to the left of the rear light well is residential.

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.Serial No.: 01121378

Statistical Analysis Modules: Built in module capable of computing the percentile levels LA_1, LA_{10}, LA_{50}, LA_{90} and LA_{99} and also the LA_{eq} level.

Acoustic Calibrator: Bruel & Kjaer type 4231 electronic calibrator. Serial No.: 1934160

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

3.1. Existing Noise Climate

Road traffic travelling on surrounding roads could be heard at the start and end of the survey, so the noise levels measured will include contributions from road vehicles.

Commercial jet aircraft were observed at medium and high altitude during the manned periods at the start and the end of the survey, so it is possible that the noise levels measured could include contributions from medium altitude jet aircraft.

There are no overland railways nearby, so the noise levels measured will not include contributions from rail noise.

Construction works on the top floors of the building were observed being carried out in the during the manned periods at the start and end of the survey so the sound levels recorded may not be typical of normal daytime background noise levels.

4.0. TEST PROCEDURE

The survey was conducted during a continuous 24-hour period from 9:48 am on Tuesday the 10th of November 2020 to 9:48 am on Wednesday the 11th of November 2020.

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. LA_{90} 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

The microphone was mounted onto a horizontal boom that was attached to the scaffolding which was around the top floor of the rear building. The boom was located in the rear left hand corner of the rear building.

The location of the microphone was as close to the adjacent residential properties as possible and therefore should give a noise level typical of that presently enjoyed by these properties.

The location of the microphone can be seen on the attached Photos

The microphone was connected by a low impedance cable to the associated instrumentation which was contained within a weatherproof housing.

4.2 Weather Conditions

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

Weather daytime: -	Overcast	Weather night time: -	Overcast
Wind daytime: -	Calm	Wind night time: -	Calm

The microphone was protected throughout the survey 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 L_{eq} levels measured over each 15 minute interval throughout the 24-hour period, denoted by LA_{eq}, (15 mins), are displayed as a bar graph on the attached Sketch No QF/8453/TT1 at the back of this report.

The 'A' Weighted percentile levels measured over each 15 minute interval throughout the 24-hour period, 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/TT2 at the back of this report.

5.1. Summary of Results

The table QF/8453/DD1 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/DD1 – Summary of Maximum and Minimum Noise Levels

	LA_{eq}	**LA_{1}**	**LA_{10}**	**LA_{50}**	**LA_{90}**	**LA_{99}**
Minimum	47dBA	52dBA	49dBA	47dBA	45dBA	44dBA
Maximum	71dBA	79dBA	75dBA	67dBA	59dBA	57dBA

The table QF/8453/DD2 below states the minimum LA_{90} noise levels recorded during the time periods of 7.00am to 23.00pm (Daytime / Evening) and between 23.00pm and 7.00am (Night time)

Table QF/8453/DD2 – Minimum LA_{90} Noise Levels – Daytime/Evening and Night time

	Minimum LA_{90}
Daytime/Evening (7am to 11pm)	47dBA
Night Time (11pm to 7am)	45dBA

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

The local planning authority is the London Borough of Camden.

The Camden Local Plan sets out the Council's planning policies and replaces the Core Strategy and Development Policy planning documents (adopted in 2010). It ensures that Camden continues to have robust, effective and up-to-date planning policies that respond to changing circumstances and the borough's unique characteristics and contribute to delivering the Camden Plan and other local priorities.

The Local Plan will cover the period from 2016-2031. Policy A4 of The Local Plan is entitled Noise and Vibration and states:

The Council will seek to ensure that noise and vibration is controlled and managed. Development should have regard to Camden's Noise and Vibration thresholds (Appendix 3). We will not grant planning permission for a) a development likely to generate unacceptable noise and vibration impacts or b) a development sensitive to noise in locations which experience high levels of noise, unless appropriate attenuation measures can be provided and will not harm the continued operation of existing uses. We will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity. We will also seek to minimise the impact on local amenity from deliveries and from the demolition and construction phases of development.

The parts of Appendix 3 that we have identified as relevant to this application are as follows:

Appendix 3: Noise thresholds

The significance of noise impact varies dependent on the different noise sources, receptors and times of operation presented for consideration within a planning application. Therefore, Camden's thresholds for noise and vibration evaluate noise impact in terms of various 'effect levels' described in the National Planning Policy Framework and Planning Practice Guidance:

- *NOEL – No Observed Effect Level*
- *LOAEL – Lowest Observed Adverse Effect Level*
- *SOAEL – Significant Observed Adverse Effect Level*

Three basic design criteria have been set for proposed developments, these being aimed at guiding applicants as to the degree of detailed consideration needed to be given to noise in any planning application. The design criteria outlined below are defined in the corresponding noise

tables. The values will vary depending on the context, type of noise and sensitivity of the receptor:

- *Green – where noise is considered to be at an acceptable level.*
- *Amber – where noise is observed to have an adverse effect level, but which may be considered acceptable when assessed in the context of other merits of the development.*
- *Red – where noise is observed to have a significant adverse effect.*

Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)

Existing Noise sensitive receptor	*Assessment Location*	*Design Period*	*LOAEL (Green)*	*LOAEL to SOAEL (Amber)*	*SOAL (Red)*
*Dwellings***	*Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)*	*Day*	*'Rating level' 10dB* below background*	*'Rating level' between 9dB below and 5dB above background*	*'Rating level' greater than 5dB above background*
*Dwellings***	*Outside bedroom window (façade)*	*Night*	*'Rating level' 10dB* below background and no events exceeding 57dB L_{Amax}*	*'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB L_{Amax}*	*'Rating level' greater than 5dB above background and/or events exceeding 88dB L_{Amax}*

**10dB should be increased to 15dB if the noise contains audible tonal elements (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.*

***levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.*

The periods in Table C correspond to 0700 hours to 2300 hours for the day and 2300 hours to 0700 hours for the night. The Council will take into account the likely times of occupation for types of development and will be amended according to the times of operation of the establishment under consideration.

There are certain smaller pieces of equipment on commercial premises, such as extract ventilation, air conditioning units and condensers, where achievement of the rating levels (ordinarily determined by a BS:4142 assessment) may not afford the necessary protection. In these cases, the Council will generally also require an NR curve specification of NR35 or below, dependant on the room (based upon measured or predicted L_{eq} (5mins) noise levels in octave bands, 1 metre from the façade of affected premises, where the noise sensitive premise is located in a quiet background area.

5.3. Determination of noise sensitive property design criteria

We believe that the sound produced by the new plant will not be intermittent or contain tones. To comply with a green rating from the table above the new plant should therefore have a Sound Pressure Level 10dB below the lowest LA_{90} background noise level at 1 metre from the nearest noise sensitive window.

The lowest recorded LA_{90} background noise levels measured during the 24 hour survey period are given in Table QF/8453/DD2 above.

Applying the above criteria gives limiting rating levels as listed in table QF/8453/DD3 below:

Table QF/8453/DD3 – Proposed Design Rating Levels (LA_{eq})

Existing Noise sensitive receptor	*Design Period*	*Lowest measured background level*	***Proposed rating level***	*Proposed Local Authority criteria*
Dwellings	*Day*	*47dBA*	***37dBA***	*Green*
	Night	*45dBA*	***35dBA***	*Green*

5.4. Determination of commercial design criteria

The use of the commercial premises surrounding the site consists mostly of offices. It is therefore proposed that the recommendations given in BS8233:2014 and that Table 2 of that standard be considered.

	Good	Reasonable
Open Plan offices: $LA_{eq,T}$	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 the rating level at 1 metre external to the nearest affected office windows should be 45dBA + 10dB = 55dBA.

5.5. Summary of external noise criteria

Based upon the lowest measured LA_{90} background noise levels during the survey and the Council's requirements outlined above we summarise the design rating levels to be adopted for this project in table QF/8453/DD4: -

Table QF/8453/DD4 – recommended design rating levels $L_{Ar,T}$

Type of premises	**$L_{Ar,T}$ (7am - 11pm)**	**$L_{Ar,T}$ (11pm - 7am)**
Noise sensitive	37dBA	35dBA
Commercial	-	55dBA

6.0. DISCUSSION OF RESULTS

The new condensing unit that is to be located in the small rear light well at the back of the rear building is a Mitsubishi PUZ-ZM100YKAR1 unit.

The position of the condenser will be as indicated on the attached Bianco Sale drawing No A3933/M009 (Revision 5). The new condenser is to be located next to four previously consented condensers.

The tables QF/8453/DD5 and -/DD6 below list the noise levels of the four existing condensers together with the noise level of the proposed new additional Mitsubishi condenser. The tables also list the natural attenuation to the nearest residential and office windows.

Table QF/8453/DD5 – Noise Level of Condensers and Natural 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
Mitsubishi PUHZ-HW140YHA2 (2 off)	63	58	55	54	50	46	40	33
Mitsubishi PUHZ-ZRP100YKA3 (2 off)	57	57	56	52	49	44	39	32
Mitsubishi PUZ-ZM100YKA	54	54	53	49	46	41	36	29
Combined Free Field SPL at 1 metre	64	61	59	56	53	48	43	36
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	49	44	40	35	32	27	22	15

The above spectrum is equivalent to 37.8dBA which is 0.8dB above the established noise criteria of 37dBA for daytime operation of the plant..

The following table QF/8453/DD6 shows the noise level of the condensers and the attenuation to the nearest office window in the building to the rear of the light well.

Table QF/8453/DD6 – 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	64	61	59	56	53	48	43	36
Reverberation of adjacent building structures	+3	+3	+3	+3	+3	+3	+3	+3
Distance to nearest office window in front building – 5 metres ($10\log A_4/A_1$)	-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	51	46	42	35	30	25	18	11

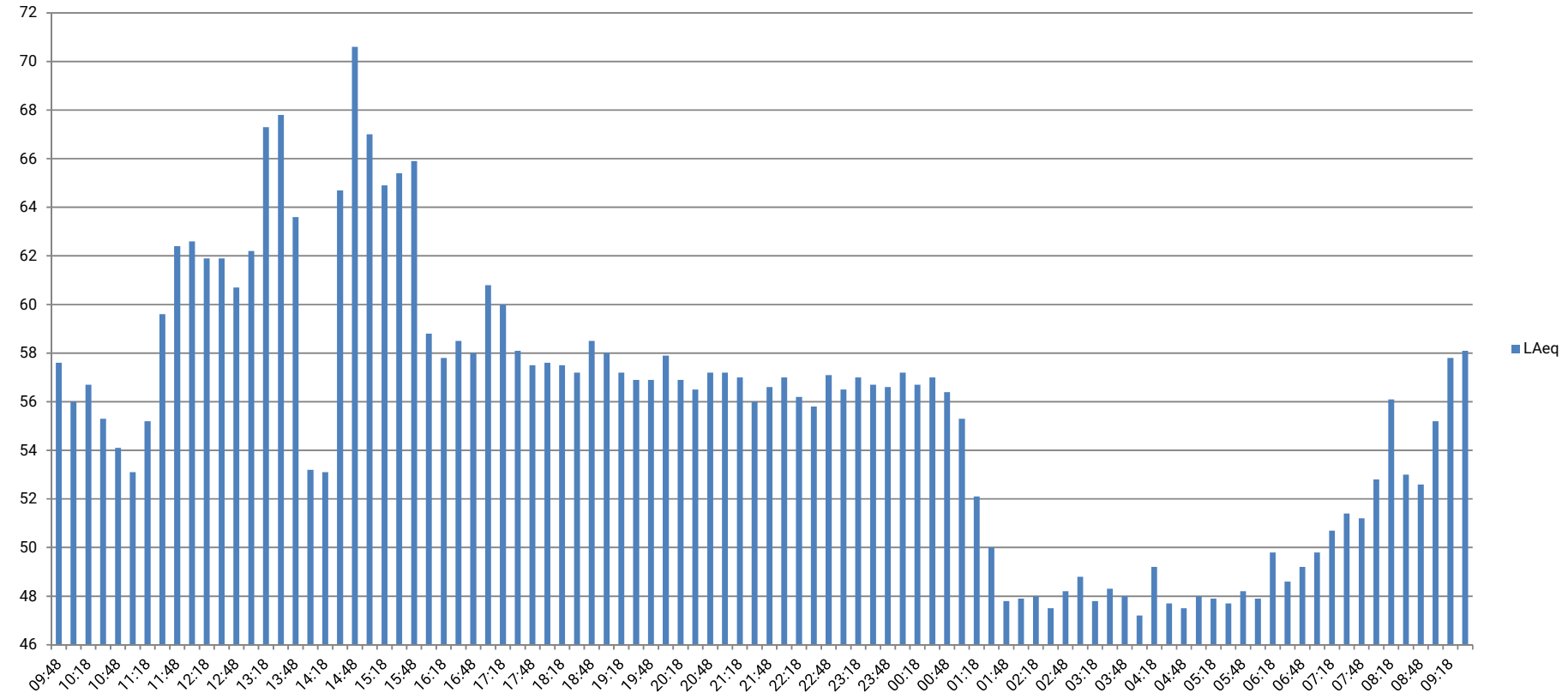
We believe that the condensers in the rear light well will only operate during the daytime/evening time period (7am to 11pm)

The above noise level is equivalent to 38dBA which is 17dB lower than the design rating level for 1 metre from the nearest office. The noise level produced by the plant in the rear light well will therefore be acceptable to the office users in the building to the rear of the site.

The noise level produced by the plant in the rear light is very close to being acceptable to the residential properties to the left of the light well. The combined noise level is only 0.8dB higher than the established noise criteria at 1 metre from these flats.

In order to ensure compliance with the recommended noise level at the residential properties we would recommend that a solid barrier be placed across the end of the light well as indicated on the attached Photo D . This barrier can be fabricated from any continuous solid material having a minimum mass of 15Kgs/m^2.

Emtec Products Ltd
18th November 2020



TITLE: *LAeq Levels*	*ISSUE DATE:* *12th November 2020*				*DRAWN BY:* *MGR*	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*
CLIENT: *Affinia Associates Ltd*	*PF No: 6833*				*APPROVED BY:* *MGR*	*REVISION*							
PROJECT: *24-32 Stephenson Way, London NW1*	*Q*	*A*	*M*	*I*	*DESIGN AUTH:* *MGR*	*SKETCH No. QF/8453/TT1*							

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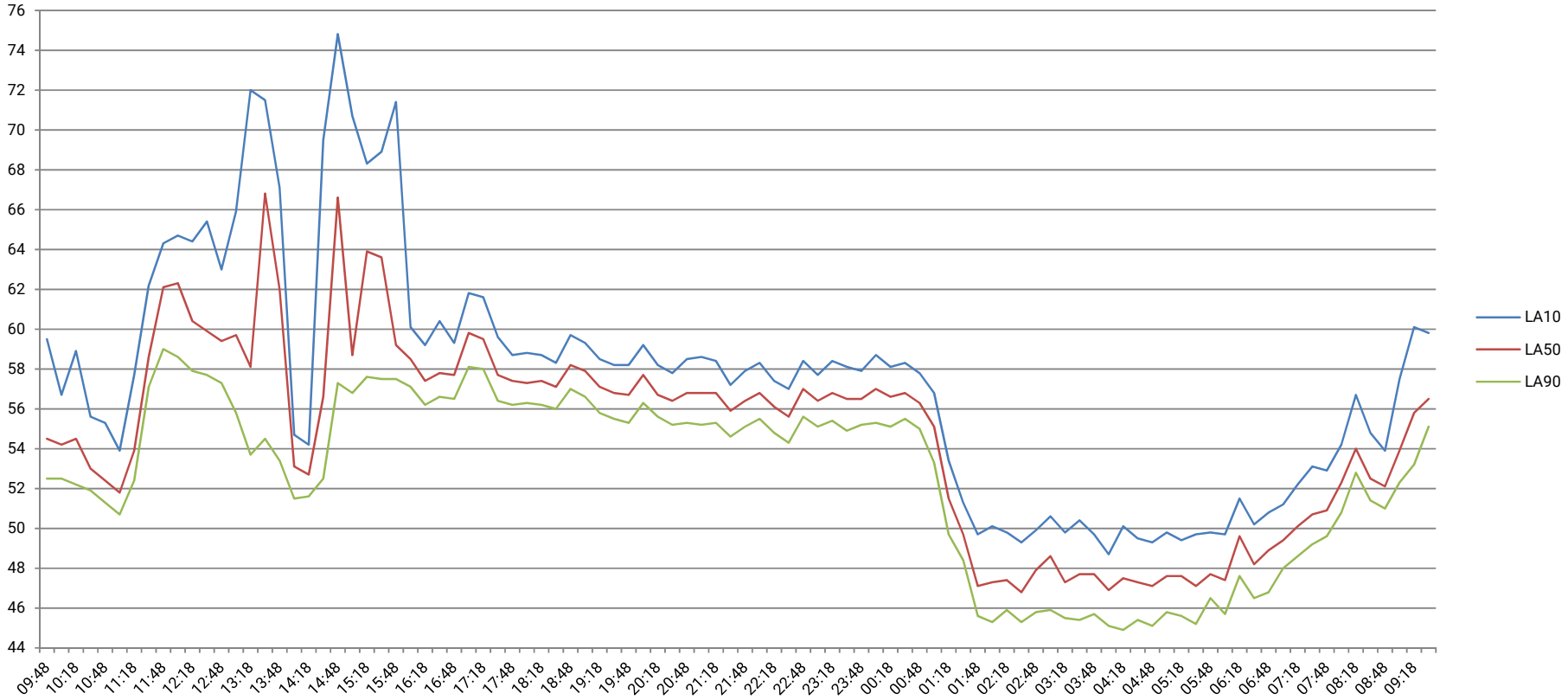

TITLE: *LA10; LA50 & LA90 Levels*	*ISSUE DATE:* *12th November 2020*				*DRAWN BY:* *MGR*	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*
CLIENT: *Affinia Associates Ltd*	*PF No: 6833*				*APPROVED BY:* *MGR*	*REVISION*							
PROJECT: *24-32 Stephenson Way, London NW1*	*Q*	*A*	*M*	*I*	*DESIGN AUTH:* *MGR*	*SKETCH No. QF/8453/TT2*							

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APPENDIX 'A'

Raw Data – Noise Survey

10th of November 2020 to 11th of November 2020

EMTEC PRODUCTS LTD.

Project: 24-32 Stephenson Way, London NW1
Client: Affinia Associates Ltd
Date: 10th to 11th November 2020
Serial No: 01121378

Address	Start Time	LA_{eq}	LE	Lmax	Lmin	LA_{1}	LA_{10}	LA_{50}	LA_{90}	LA_{99}
1	09:48	58	87	79	50	67	60	55	53	51
2	10:03	56	86	80	50	65	57	54	53	51
3	10:18	57	86	78	50	65	59	55	52	51
4	10:33	55	85	77	50	65	56	53	52	51
5	10:48	54	84	74	49	63	55	52	51	50
6	11:03	53	83	77	49	59	54	52	51	50
7	11:18	55	85	66	51	61	58	54	52	52
8	11:33	60	89	69	55	65	62	59	57	56
9	11:48	62	92	76	55	67	64	62	59	57
10	12:03	63	92	78	56	68	65	62	59	57
11	12:18	62	92	79	56	68	64	60	58	57
12	12:33	62	92	77	55	68	65	60	58	57
13	12:48	61	90	72	55	69	63	59	57	56
14	13:03	62	92	74	50	70	66	60	56	51
15	13:18	67	97	75	51	73	72	58	54	52
16	13:33	68	97	81	52	74	72	67	55	53
17	13:48	64	93	79	51	71	67	62	53	52
18	14:03	53	83	61	50	56	55	53	52	51
19	14:18	53	83	69	50	57	54	53	52	51
20	14:33	65	94	82	51	75	70	57	53	52
21	14:48	71	100	84	55	79	75	67	57	56
22	15:03	67	97	87	55	77	71	59	57	56
23	15:18	65	95	75	55	71	68	64	58	56
24	15:33	65	95	78	54	73	69	64	58	56
25	15:48	66	96	82	55	76	71	59	58	56
26	16:03	59	88	74	55	62	60	59	57	56
27	16:18	58	87	75	54	61	59	57	56	55
28	16:33	59	88	66	54	63	60	58	57	56
29	16:48	58	88	69	54	62	59	58	57	56
30	17:03	61	90	78	55	69	62	60	58	57
31	17:18	60	90	75	56	65	62	60	58	57
32	17:33	58	88	71	55	63	60	58	56	56
33	17:48	58	87	66	54	61	59	57	56	55
34	18:03	58	87	66	55	62	59	57	56	55
35	18:18	58	87	63	54	60	59	57	56	55
36	18:33	57	87	61	54	60	58	57	56	55
37	18:48	59	88	67	55	63	60	58	57	56
38	19:03	58	88	63	55	61	59	58	57	56
39	19:18	57	87	64	53	60	59	57	56	55
40	19:33	57	87	62	53	60	58	57	56	55
41	19:48	57	87	64	53	60	58	57	55	54
42	20:03	58	88	66	54	61	59	58	56	55
43	20:18	57	87	62	54	60	58	57	56	55
44	20:33	57	86	60	53	59	58	56	55	54
45	20:48	57	87	71	53	61	59	57	55	54
46	21:03	57	87	68	53	62	59	57	55	54
47	21:18	57	87	63	53	60	58	57	55	54
48	21:33	56	86	69	53	58	57	56	55	54
49	21:48	57	86	62	53	60	58	56	55	54

50	22:03	57	87	62	53	60	58	57	56	55
51	22:18	56	86	60	52	58	57	56	55	54
52	22:33	56	85	66	52	59	57	56	54	53
53	22:48	57	87	63	53	60	58	57	56	55
54	23:03	57	86	66	53	59	58	56	55	54
55	23:18	57	87	61	53	60	58	57	55	54
56	23:33	57	86	61	53	60	58	57	55	54
57	23:48	57	86	61	53	59	58	57	55	54
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59	00:18	57	86	62	53	59	58	57	55	54
60	00:33	57	87	62	54	60	58	57	56	55
61	00:48	56	86	60	53	59	58	56	55	54
62	01:03	55	85	60	50	58	57	55	53	51
63	01:18	52	82	68	48	58	53	52	50	49
64	01:33	50	80	55	47	53	51	50	48	48
65	01:48	48	77	55	44	52	50	47	46	45
66	02:03	48	78	55	43	53	50	47	45	44
67	02:18	48	78	55	44	53	50	47	46	45
68	02:33	48	77	55	44	52	49	47	45	45
69	02:48	48	78	55	44	53	50	48	46	45
70	03:03	49	78	55	44	53	51	49	46	45
71	03:18	48	77	55	44	53	50	47	46	45
72	03:33	48	78	54	44	53	50	48	45	45
73	03:48	48	78	58	44	53	50	48	46	45
74	04:03	47	77	54	43	52	49	47	45	44
75	04:18	49	79	69	43	59	50	48	45	44
76	04:33	48	77	55	44	52	50	47	45	44
77	04:48	48	77	57	44	52	49	47	45	44
78	05:03	48	78	55	44	52	50	48	46	45
79	05:18	48	78	54	44	52	49	48	46	45
80	05:33	48	77	55	44	53	50	47	45	45
81	05:48	48	78	54	45	53	50	48	47	46
82	06:03	48	78	54	44	52	50	47	46	45
83	06:18	50	79	56	46	54	52	50	48	46
84	06:33	49	78	55	45	53	50	48	47	46
85	06:48	49	79	57	45	53	51	49	47	46
86	07:03	50	79	55	46	54	51	49	48	47
87	07:18	51	80	67	46	56	52	50	49	47
88	07:33	51	81	63	48	57	53	51	49	48
89	07:48	51	81	58	48	55	53	51	50	49
90	08:03	53	82	63	49	59	54	52	51	50
91	08:18	56	86	74	51	66	57	54	53	52
92	08:33	53	83	61	50	57	55	53	51	51
93	08:48	53	82	68	49	57	54	52	51	50
94	09:03	55	85	72	51	62	58	54	52	51
95	09:18	58	87	75	51	67	60	56	53	52
96	09:33	58	88	79	54	65	60	57	55	54

APPENDIX ‘B’

Photos and Drawing

Photo A – View of front façade of 24-32 Stephenson Way, London NW1

Photo B – View from above looking down into light-well at rear of 24-32 Stephenson Way, London NW1

Photo C – View of light-well at rear of 24-32 Stephenson Way, London NW1

Photo D – View looking upward to the west from light-well at rear of 24-32 Stephenson Way, London NW1

Neighbouring noise sensitive residential windows

Location of microphone attached to scaffolding

Photo E – View looking north east from roof of 24-32 Stephenson Way, London NW1

Photo F – View looking north at 1st floor level from rear of 24-32 Stephenson Way, London NW1

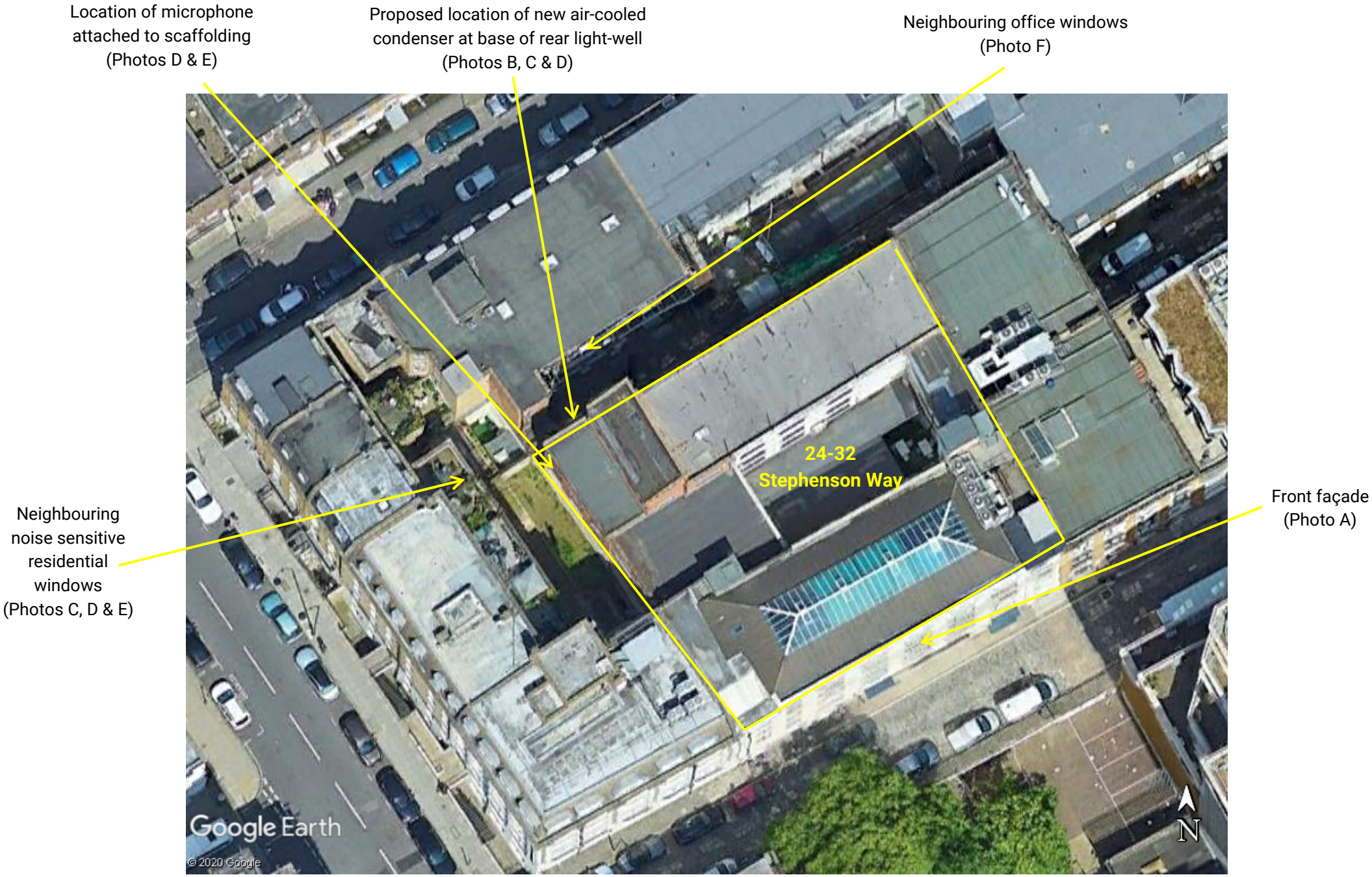


Photo G: Aerial Overview of site and surroundings at 24-32 Stephenson Way, London NW1

LOCATION OF NEW CONDENSING UNIT TO OFFICE
809mm L x 300mm W x 630mm H

NEW CONDENSING UNIT FROM COMMS ROOM SPLIT DX UNIT AT LOW LEVEL ON WALL c/w CONDENSE DRAIN TO DISCHARGE AT LOW LEVEL ABOVE GULLY.

NEW CONDENSING UNITS FROM AHU HEAT PUMP IN 1ST FLOOR PLANTROOM AND FROM COMMS ROOM DX UNIT ON FIRST FLOOR

NEW 35mm CONDENSATE DISCHARGE CONNECT TO EXISTING SVP C/W SELF SEALING WATE LESS TRAP.

SGB01 – 1200w X 450H WATERLOO 2H.
SGB02 – 1200W X 450H WATERLOO 2H.
SGB03 – 1200W X 450H WATERLOO 2H.

100 ø EXTRACT FANS MOUNTED THROUGH ACCESS PANELS WITH DISCHARGE LOUVRES IN GLASS PANEL

NEW VCD ON DUCTWORK

NEW 200x200mm EXTRACT DUCTWORK RISE FROM BELOW TO HIGH LEVEL DISCHARGE POINT –SMOKE DAMPER IN FLOOR SLAB C/W ACCESS PANEL FROM ABOVE–TO COORDINATE WITH EXISTING SERVICES.

NEW EXTRACT FAN AT HL IN CORRIDOR

NEW 200x200mm EXTRACT DUCTWORK RISE TO GARAGE AREA ABOVE WITH SD AND A/P IN FLOOR.

NEW ELECTRIC HEATER TYPE NOBO NTE4N CONVECTOR HEATER C/C ELECTRONIC THERMOSTAT & NOBCONTROLLER.

REFRIGERANT PIPEWORK DROP TO LL WITHIN LL CONTAINMENT TO SERVE FLOOR STANDING 63 UNIT.

NEW COMMS ROOM FAN COIL UNIT c/w DRIP TRAY LEAK DETECTION MONITORING AND ALARM LOCATED ON WALL.

NEW REFRIGERANT PIPEWORK AND CONDENSATE DRAIN FROM NEW SPLIT DX IN COMMS ROOM ON NEW CABLE TRAY

NEW 28ø CONDENSATE CONNECT TO EXISTING SVP WITHIN RISER VOID SELF SEALING C/W WATERLESS TRAP.

NEW 28ø CONDENSATE CONNECT TO EXISTING SVP WITHIN RISER VOID C/W SELF SEALING WATERLESS TRAP.

REFRIGERANT PIPEWORK FROM NEW AND EXISTING UNITS CONNECT TO EXISTING DB CONTROLLER IN CORRIDOR .

EXISTING EXTRACT FAN TO REMAIN

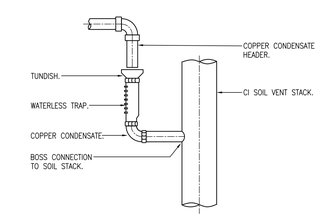
EXISTING DUCTWORK TO REMAIN

EXISTING BC BOX TO REMAIN

300mm ELEC TRAY

EXISTING COMMS ROOM A/C UNIT TO REMAIN

NOTES:
REFER TO DRAWING FOR PIPEWORK DIAMETERS.



TYPICAL CONDENSATE TRAP TO SVP ARRANGEMENT

Lower Ground Floor Plan

NOTES
Do NOT scale from this drawing.
Contractor to take and check all dimensions on site before work commences.
Discrepancies to be reported to Bianco Sale Ltd.
Subcontractors to verify all dimensions on site before making shop drawings or commencing manufacture.

Rev.	Description	Initial	Chkd	Date
0	FOR TENDER	DMH	SMcD	AUG 17
1	UPDATED TO INCORPORATE BUILDING CONTROL & LANDLORD'S COMMENTS	DMH	SMcD	OCT 17
2	CONTRACT ISSUE	DJB	SMcD	NOV 17
3	INCORPORATING CLIENT AND ARCHITECTS CHANGES	DJB	SMcD	NOV 17
4	INCORPORATING CLIENT AND ARCHITECTS CHANGES	DJB	SMcD	JAN 18
5	INCORPORATING CLIENT AND ARCHITECTS CHANGES & REVISION NOTES ADDED	DJB	SMcD	JAN 18

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL A3933 SERIES DRAWINGS & SPECIFICATIONS.
2. REFER TO PIPEWORK SCHEMATIC FOR PIPEWORK DISTRIBUTION.
3. ALL REFRIGERANT PIPEWORK SHALL BE INSTALLED ON HEAVY DUTY CABLE TRAY.
4. CONDENSATE PIPEWORK TO BE PROVIDED FOR ALL INDOOR SPLIT SYSTEM VRF UNITS & BC CONTROLLERS TAKEN TO NEAREST SOIL STACK COMPLETE WITH HEPVO WATERLESS TRAP VALVE.
5. ALL CONDENSATE PIPEWORK SHALL BE INSTALLED IN COPPER PIPEWORK & INSULATED (VAPOUR SEALED).
6. EACH SPLIT SYSTEM AND VRF INDOOR UNITS SHALL BE PROVIDED WITH LOCAL WALL MOUNTED ROOM CONTROLLER, FINAL LOCATION TO BE AGREED.
7. REFRIGERANT DISTRIBUTION PIPEWORK BETWEEN THE SYSTEM BC BOXES & INDOOR UNITS SHALL BE INSTALLED & COORDINATED WITH NEW & EXISTING ME&P SERVICES.
8. THIS IS A CONTRACT DRAWING & SHALL NOT BE USED FOR CONSTRUCTION PURPOSES.
9. ALL WORKING DRAWINGS WILL BE UNDERTAKEN BY THE SERVICES SUB CONTRACTOR TO ALL OF THE LATEST INFORMATION PROVIDED BY THE ARCHITECT & STRUCTURAL ENGINEER.
10. THE SERVICES SUB CONTRACTORS SHALL FULLY COORDINATE THE MECHANICAL, ELECTRICAL, PUBLIC HEALTH & FIRE PROTECTION DRAWINGS WITH ALL OTHER CONTRACTORS, SPECIALISTS & TRADES.
11. THE SERVICES SUB CONTRACTOR SHALL FULLY LIAISE WITH ALL OTHER CONTRACTORS TO ENSURE ADEQUATE PERMANENT FLOOR, WALL & CEILING ACCESS PANELS FOR THE BUILDING SERVICES ARE FULLY DETAILED & INSTALLED.
12. THE SERVICES CONTRACTOR SHALL PROVIDE TECHNICAL SUBMISSIONS FOR ALL MATERIALS TO THE PROFESSIONAL TEAM PRIOR TO ORDER FOR THEIR COMMENTS.
13. ALL DIMENSIONS IN MILLIMETERS (UNLESS OTHERWISE NOTED).
ALL DIMENSIONS ARE TO BE VERIFIED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
14. DO NOT SCALE FROM THESE DRAWINGS, REFER TO ARCHITECTS DRAWINGS FOR SETTING OUT & DIMENSIONAL DATA.
15. ALL SERVICES PASSING THROUGH FIRE & SMOKE BARRIERS/WALLS SHALL BE SUITABLY FIRE STOPPED TO THE SAME STANDARDS AS THE BARRIER/WALL BEING PENETRATED.
16. EXISTING VRF SYSTEM SHALL BE RETAINED AND MODIFIED AS INDICATED. TESTED AND COMMISSIONED TO ACHIEVE SCHEDULED DUTIES.
17. OUTDOOR UNITS SHALL HAVE CONDENSE CONNECTION PIPED TO DISCHARGE OVER GULLY.

REVISIONS FROM CONTRACT ISSUE:

I. SUPPLY VENTILATION ADDED TO COURIER ROOM, SUPPLY GRILLES SGB05 AND SGB04 ADDED.
II. EHB001, 002, 003 REFERENCES SHOWN AS SPECIFICATION.
III. EF01 DISCHARGE IN GROUND FLOOR LOADING BAY SHOWN – FIRE DAMPERS CHANGED TO SMOKE DAMPERS ON EXHAUST DUCTWORK THROUGH FLOOR.

LEGEND:

C SPLIT SYSTEM OR VRF ROOM CONTROLLER.
T DUCT MOUNTED TEMPERATURE SENSOR.
FCU BXX FAN COIL REFERENCES No.'s.
C VRF SYSTEM No.

CONTRACT ISSUE

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Client: UNILABS LTD

Project: STEPHENSON WAY

Title: PROPOSED LOWER GROUND FLOOR VENTILATION SERVICES LAYOUT

Drawing No.		Date	JUN 17
A3933	M009	Drawn By	DJB
		Checked	SMcD
Scale 1:50@A0		Rev.	5