



Hann Tucker Associates

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PROJECT TECHNICAL MEMORANDUM

JOB TITLE : Westminster House, Richmond,
TW9 2ND
REF : HT: 31059/PTM4-R2
DATE : 3 September 2024
FROM : Kyungmin Kim
ISSUED TO : Baden Properties Ltd

RE: WESTMINSTER HOUSE, RICHMOND TW9 2ND PLANNING CONDITION U0182941

1.0 Introduction

Hann Tucker Associates Limited (Hann Tucker) was previously commissioned by Baden Properties Ltd to undertake an environmental noise survey and noise impact assessment in order to assess the suitability of the proposed development at Westminster House, Richmond, TW9 2ND for residential and commercial use as part of the planning application – full detail of which are within Environmental Noise Survey and Noise Impact Assessment Report ref. 31059/NIA1/Rev3 dated 15 December 2023.

Since submission of the above to the Local Authority, we understand the EHO of London Borough of Richmond Upon Thames (LBRT from herein) have stipulated the following planning condition relating to new mechanical plant items to be proposed as part of the scheme.

“Before any mechanical plant is used at the premises, a scheme shall be submitted to and approved in writing by the local planning authority which demonstrates that the following noise criteria can be complied with. The plant shall not be installed or operated other than in accordance with the approved details. The cumulative measured or calculated rating level of noise emitted from all mechanical plant and services to which the application refers, shall be 5dB(A) below the existing background noise level, at all times that the mechanical plant and services operates. The measured or calculated noise levels shall be determined at the boundary of the nearest ground floor noise sensitive premises or 1 metre from the façade of the nearest first floor (or higher) noise sensitive premises, and in accordance to the latest British Standard 4142. An alternative position for assessment/measurement may be used to allow ease of access, which must be shown on a map and noise propagation calculations detailed to show how the design criteria is achieved. The plant shall be supported on adequate

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proprietary anti-vibration mounts as necessary to prevent the structural transmission of vibration and regenerated noise within adjacent or adjoining premises, and these shall be so maintained thereafter.

REASON: To protect the amenity of future occupiers and of residents of nearby properties.”

Hann Tucker have therefore been commissioned to undertake a desktop exercise with reference to the above planning condition based on the data from our previous environmental noise survey to assess the suitability of the proposed mechanical plant items.

Where required, appropriate measures to mitigate noise impacts from the proposed plant items (when operational) have been discussed in context with above planning condition and BS4142.

Our findings are presented herein.

2.0 Environmental Noise Survey

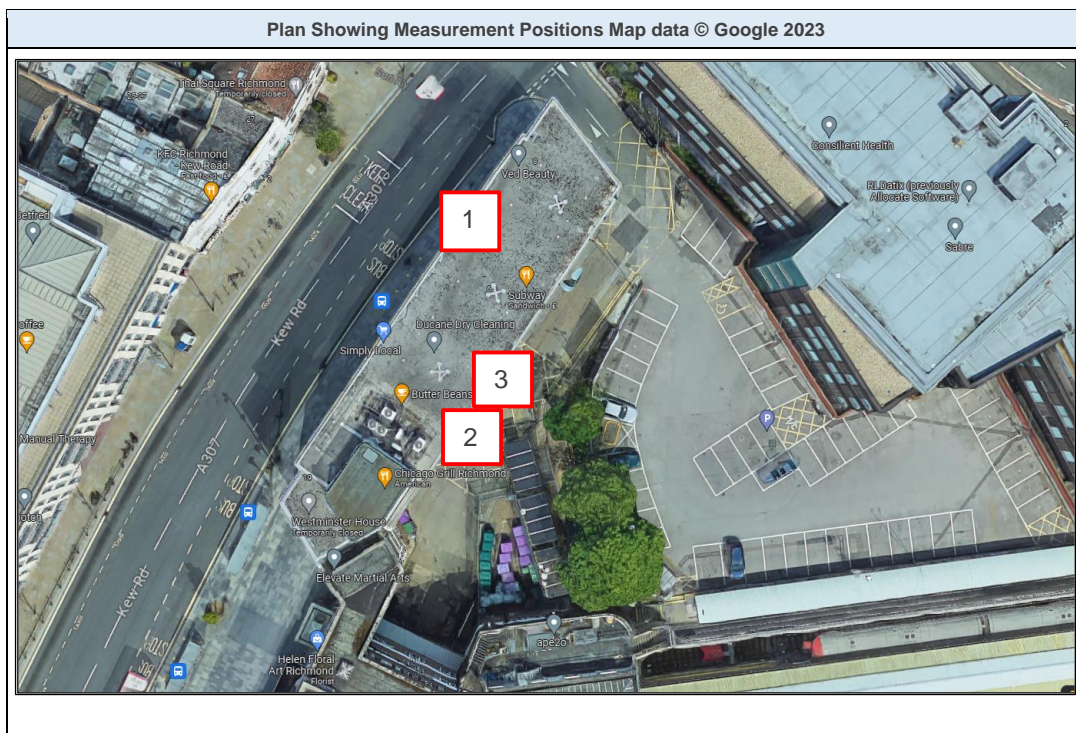
An environmental noise survey of the site has previously been undertaken by Hann Tucker Associates as part of the planning stage input on the scheme. The full methodology and results of our environmental noise survey are presented in our Environmental Noise Survey and Plant Noise Assessment report ref. 31059/NIA1/Rev3 dated 15 December 2023.

For ease of reference, the measured typical background noise levels from our noise survey and respective measurement positions from our previous survey are presented below:

Position	Day/Period	Measured Typical Background Noise Levels (dB)	
		Daytime (07:00 – 23:00 hrs)	Night-time (23:00 – 07:00 hrs)
		L _{A90}	L _{A90}
1	Friday 20 October 2023	61	58
	Saturday 21 October 2023	61	46
	Sunday 22 October 2023	59	55
	Monday 23 October 2023	60	45
	Tuesday 24 October 2023	61	-
2	Friday 20 October 2023	63	53
	Saturday 21 October 2023	64	57
	Sunday 22 October 2023	62	51
	Monday 23 October 2023	62	53
	Tuesday 24 October 2023	58	-



Position	Day/Period	Measured Typical Background Noise Levels (dB)	
		Daytime (07:00 – 23:00 hrs)	Night-time (23:00 – 07:00 hrs)
		L _{A90}	L _{A90}
3	Friday 27 October 2023	57	56
	Saturday 28 October 2023	58	57
	Sunday 29 October 2023	58	49
	Monday 30 October 2023	58	48
	Tuesday 31 October 2023	-	-



3.0 Source and Receiver Locations

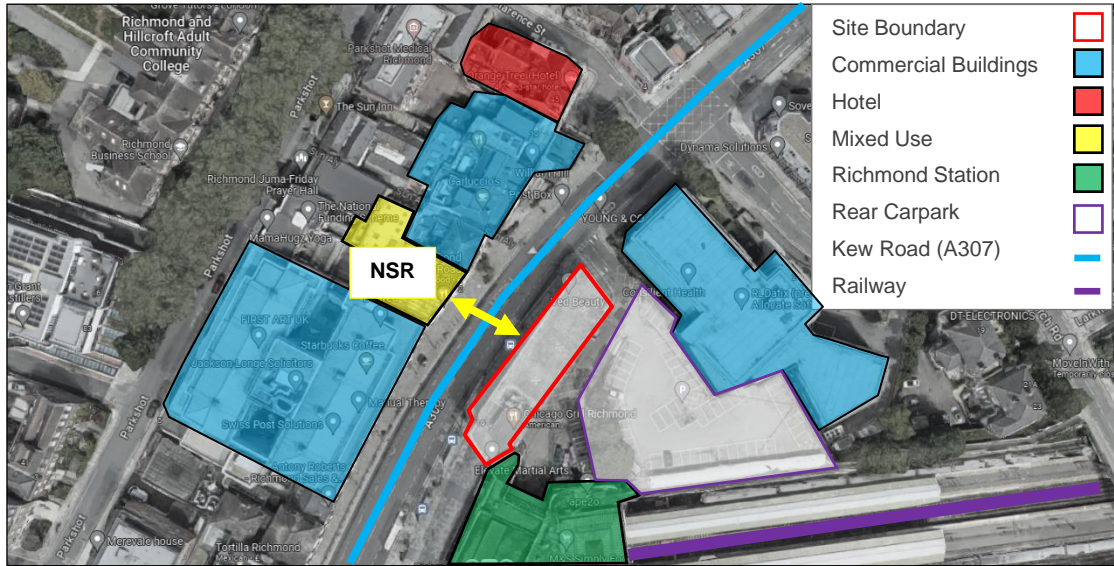
With reference to planning condition(U0182941), we understand LBRT considers noise sensitive development to include residential properties, residential institutions, educational establishments and hospitals, as well as noise sensitive land such as certain parks and gardens.

Based on our desktop and on-site review of surrounding existing and proposed developments, we note that the surrounding development are predominantly commercial, with exception of residential property located on the opposite side of Kew Road (A307) on 23-27 Kew Road, and a residential institution (i.e., Hotel) Orange Tree located on 45 Kew Road.



The nearest residential property is located on the opposite side of Kew Road (A307) on 23-27 Kew Road, within the mixed-use buildings with ground floor commercial units.

See site plan and table below.



Site Plan and Nearest Noise Sensitive Receptor Locations (Map Data © 2023 Google)

4.0 Plant Noise Emission Criteria

Based on the results from our environmental noise survey and Planning Condition U0182941 stipulated by LBRT, we proposed that the following plant noise emission criteria be achieved at 1m from the façade of nearest noise sensitive premise.

Position	Plant Noise Emission Criteria – Rating Level as per BS4142:2014 (dB, L _{A,T})		
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)	24 hours
Position 1 – On Kew Road	54	40	40
Position 2 & 3 – At Rear Carpark	52	43	43

The above criteria are to be achieved with all of the proposed plant operating simultaneously.

For emergency building services plant only used in emergencies and occasional testing - e.g. smoke extract fans and life safety generators - relaxations of the internal and external criteria are normally acceptable but should comply with local authority and occupational requirements and must not interfere with internal audible emergency alarms.



We understand LBRT have stipulated the planning condition (U0182940) relating to emergency plant items.

“Where emergency generation plant is installed and needs testing, the Local Planning Authority will permit the LAeq,T noise level from this plant to be no greater than 5dB above the existing background noise level when measured 1m externally to the nearest residential facade for the purpose of testing for up to one hour per month between 09:00 and 16:00 hours Monday to Friday only and not on public or bank holidays.

REASON: To protect the amenity of future occupiers and of residents of nearby properties.”

Based on the above, we propose that the following criteria associated with proposed emergency plant items, to be achieved at 1m from the façade of nearest noise sensitive premise between 09:00 – 16:00 hours Monday – Friday only and not on public or bank holidays.

Position	Emergency Plant Noise Emission Criteria
	Daytime 09:00 – 16:00 hours Monday – Friday only and not on public or bank holidays
Position 1 – On Kew Road	63
Position 2 & 3 – At Rear Carpark	59

We understand Planning Condition U0182940 is a General Compliance Condition and does not require any submission/action to be discharged.



5.0 Plant Noise Impact Assessment

5.1 Proposed Plant Equipment

Based on the information provided to us, the following table summarises the proposed mechanical plant items relevant to this assessment in the context of Planning Condition U0182941 imposed by the Local Authority.

Plant Description	Location	Qty	Plant Make	Model Number
Air Source Heat Pump	Roof Level	7	Daikin	Altherma ERGA06EVA
Air Source Heat Pump	Roof Office Plant Area	3	Daikin	3MXS52E4V1B2
Mechanical Smoke Extract Fan	5th Floor Flat Roof	1	Systemair	DVV 800D6-XL/F400 IE3
Mechanical Smoke Extract Fan	Roof Level	1	Systemair	DVV 800D6-XL/F400 IE3
Air Source Heat Pump	Roof Office Plant Area	6	Daikin	RXYSQ8-TMY1B
Cooling/Heating	Roof Level	1	Daikin	RXYSQ4TV1

We have been informed all of the proposed plant items will be supported on suitable anti-vibration mounts as necessary to prevent the structural transmission of vibration and regenerated noise within adjacent premises.

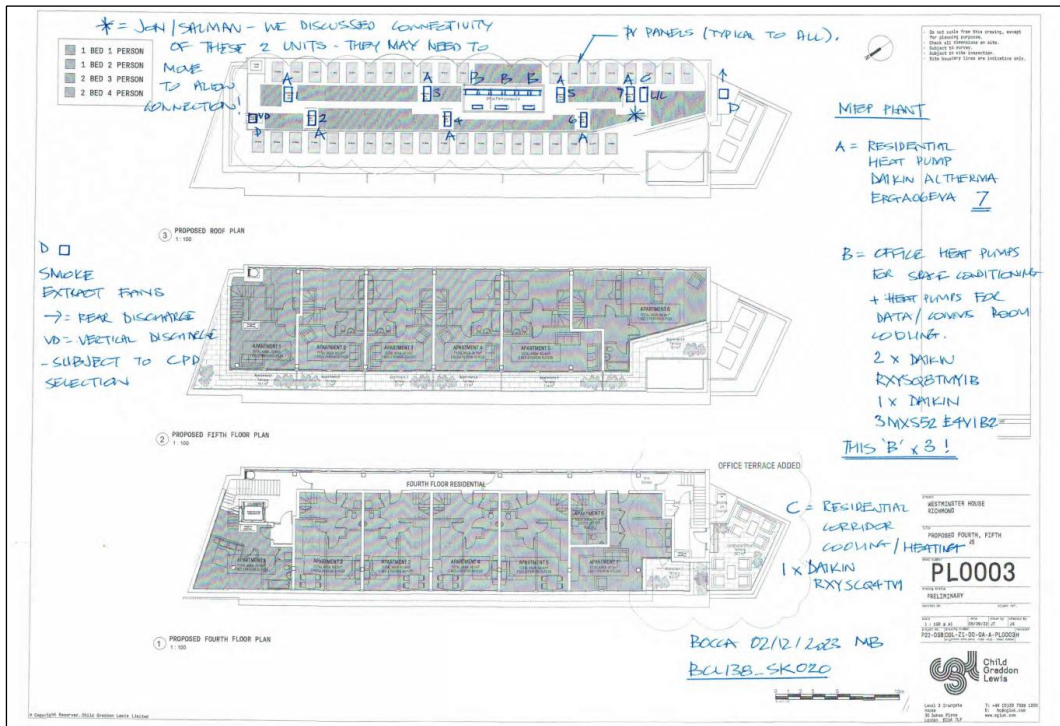
5.2 Plant Locations

All of the proposed plant items listed in Section 5.1, with exception of Smoke Extract Fan proposed on 5th Floor Flat Roof, will be located on the roof of Westminster House.

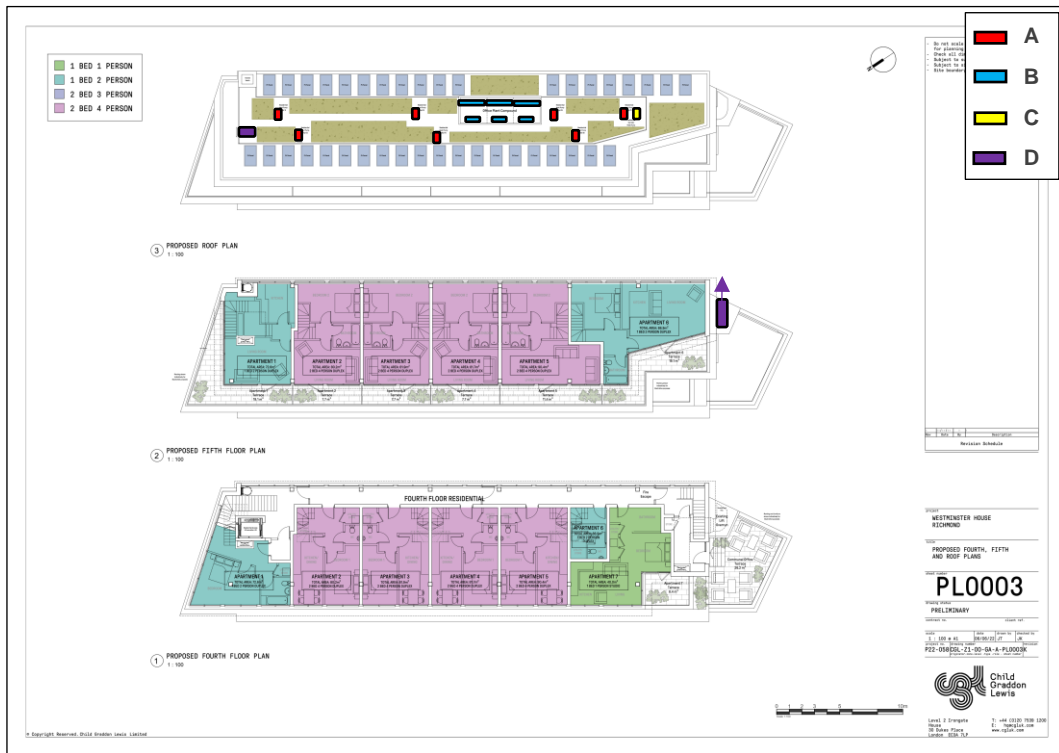
Our acoustic analysis is based on the drawings provided by First Plan, Architects In Practice, and BOCCA Consulting.

Reference	Title	Date
BCL138_SK020	Roof Plant Items Mark-up	22 August 2023
P22-058 CGL-Z1-00-GA-A-PL0003K_SK020	Proposed Fourth, Fifth, Roof Plans	06 June 2022
PL0006_RevP00	GA Plan-Proposed-Level 06 Roof	14 August 2024
PL0004_RevP00	GA Plan-Proposed-Level 04	03 September 2024

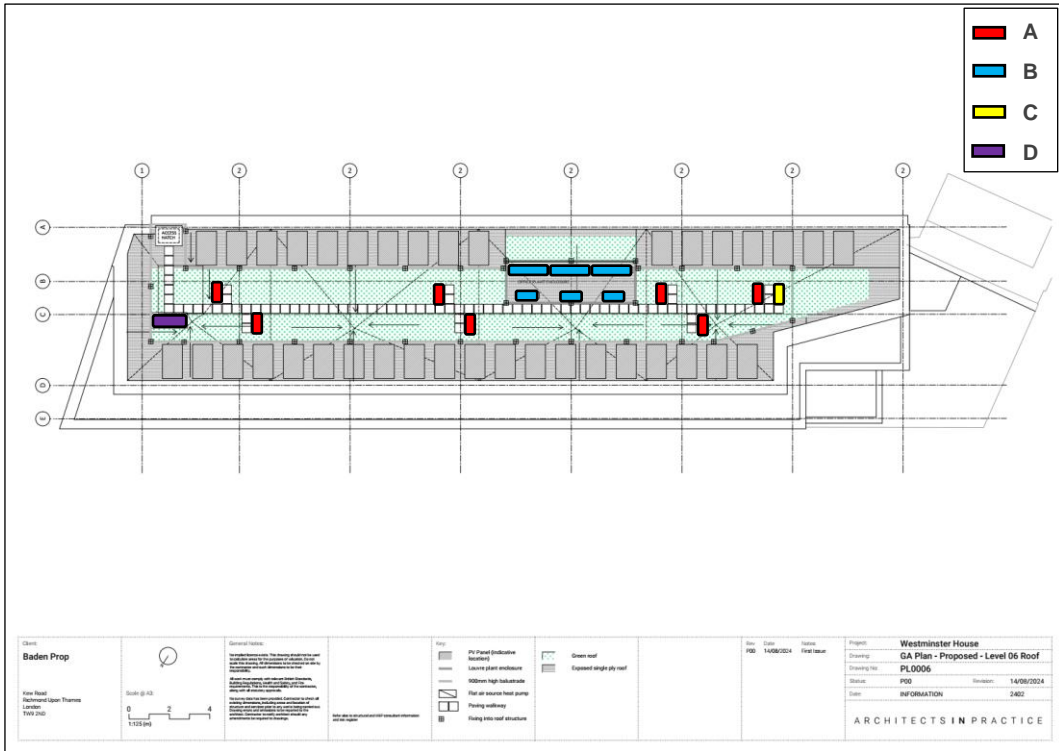
See drawings overleaf showing the locations of the proposed plant items.



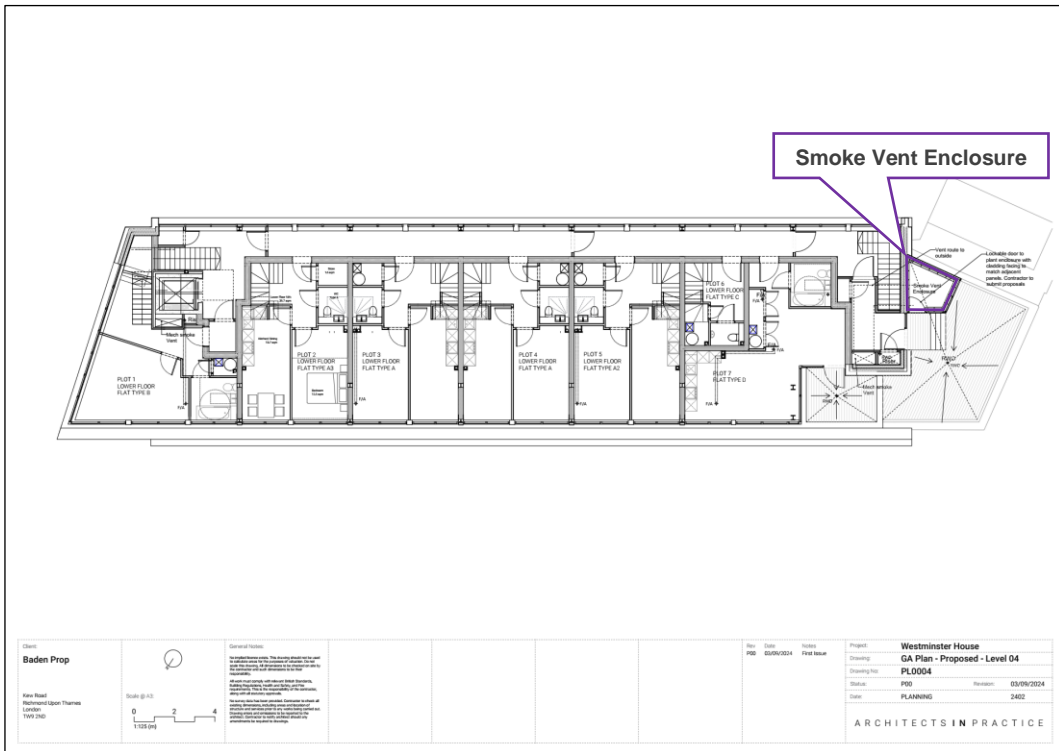
Drawing illustrating plant locations (Drawing ref. BCL138_SK020 dated 22 August 2023 provided by BOCCA Consulting)



Drawing illustrating plant locations (Drawing ref. P22-058 CGL-Z1-00-GA-A-PL0003K_SK020 dated 06 June 2022 provided by First Plan)



Proposed-Level 06 Roof Drawing illustrating plant locations (Drawing ref. PL0006_RevP00 dated 14 August 2024 provided by Architects In Practice)



Proposed-Level 04 Drawing illustrating plant locations (Drawing ref. PL0004_RevP00 dated 03 September 2024 provided by Architects In Practice)



The table below summarizes the detailed MEP Plant references marked on above drawing along with proposed operational hours:

Ref.	Description	Operating Hours
A	Residential Heat Pump Daikin Altherma ERGA06EVA	24Hours
B	Office Heat Pumps 6No. Daikin RXYSQ8TMY1B	09:00-17:30
	Data/Comms Room Cooling 3No. Daikin 3MXS52E4V1B2	24Hours
C	Residential Corridor Cooling/Heating	24 Hours
D	Smoke Extract Fans: Rear Discharge VD: Vertical Discharge	Under emergency conditions Or One hour per month between 09:00 – 16:00 hours Monday – Friday only and not on public or bank holidays for testing purposes in accordance with Planning Condition U0182940

5.3 Noise Data

The following table summarizes manufacturers noise data provided to us, associated with the proposed plant items relevant to this assessment.

Plant Description	L _w /L _p	Sound Level at Octave Band Centre Frequency (Hz)								dBA
		63	125	250	500	1k	2k	4k	8k	
Altherma ERGA06EVA	L _p at 1m	51	53	51	47	43	37	35	23	49
RXYSQ8-TMY1B	L _w	83	83	72	71	67	64	57	54	74
3MXS52E4V1B2	L _p at 1m	52	57	50	43	42	40	38	33	49
RXYSQ4TV1	L _w	71	70	67	67	64	56	49	43	68
DVV 800D6-XL/F400 IE3 Inlet	L _p	67	68	76	79	81	85	79	71	88
DVV 800D6-XL/F400 IE3 Outlet	L _w	68	70	78	80	82	86	80	72	89

This data presents “maximum” sound levels which should not, therefore, be exceeded. The sound levels shown have been based upon manufacturer’s data and should thus be typical for these units with their respective duties.

Where the manufacturers noise data provided to us have been A-weighted or presented as open inlet/outlet, we have applied the appropriate corrections to retrieve the unweighted, in-duct sound power levels.



It is essential that we are appraised of any alterations or additions to this list. Should the selection of any item of plant differ from that shown on above table, provided their sound power/pressure levels are comparable to (or less than) those shown then it should not be necessary to make significant changes to our current attenuation recommendations.

5.4 Mitigation Measure for Emergency Smoke Fans

As outlined in Section 4.0, LPA have stipulated a planning condition related to emergency plant item. We understand Planning Condition U0182940 is a General Compliance Condition and does not require any submission/action to be discharged.

Notwithstanding, based on our desktop assessment, in order to control the atmospheric noise emission in line with emergency plant noise emission criteria set out in Section 4.0, we recommend that the 5th Floor and Roof Smoke Fan Atmospheric Discharge (Outlet) is fitted with a suitable induct attenuator capable of achieving the minimum following octave band dynamic insertion loss:

Description	Minimum Insertion Losses per Octave band Centre Frequency (Hz) dB							
	63	125	250	500	1k	2k	4k	8k
Roof Mechanical Smoke Fan Atmospheric Discharge	1	2	7	10	11	9	8	7
5 th Floor Mechanical Smoke Fan Atmospheric Discharge	1	2	7	10	11	9	8	7

The aforementioned insertion losses could typically be achieved by a 50% free area 600mm length attenuator.



5.5 BS4142 Plant Noise Impact Assessment (U0182941)

It should be noted that the proposed plant items are not anticipated to exhibit any tonal or impulsive characteristics provided they are well maintained. The proposed condensers will be inverter driven and, therefore, will gently ramp up and down depending on the demands on the various systems.

In order to be robust, however, a +3dB feature correction as advised in BS 4142:2014 has been applied for the possible presence of intermittency characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment.

The following tables summarise our prediction of worst-case atmospheric noise emissions from the cluster of proposed plant items to 1m of the nearest noise sensitive residential receptor during daytime (07:00 – 23:00) and night-time (23:00 – 07:00) operation.

Daytime (07:00 – 23:00)	Unit	Noise Level at Octave Band Centre Frequency (Hz) dB								dBA
		63	125	250	500	1k	2k	4k	8k	
1no. Altherma ERGA06EVA at 1m	L _p	51	53	51	47	43	37	35	23	49
Quantity Correction for 7No.		+8	+8	+8	+8	+8	+8	+8	+8	
22m Distance Correction		-24	-24	-24	-24	-24	-24	-24	-24	
Calculated Noise Level 1m from NSR	L _p	35	37	35	31	27	21	19	7	33
1no. RXYSQ8-TMY1B	L _w	83	83	72	71	67	64	57	54	74
Quantity Correction for 6No.		+8	+8	+8	+8	+8	+8	+8	+8	
21m SWL to SPL Distance Correction		-34	-34	-34	-34	-34	-34	-34	-34	
Calculated Noise Level 1m from NSR	L _p	57	57	46	45	41	38	31	28	48
1no. 3MXS52E4V1B2 at 1m	L _p	52	57	50	43	42	40	38	33	49
Quantity Correction for 3No.		+5	+5	+5	+5	+5	+5	+5	+5	
22m Distance Correction		-24	-24	-24	-24	-24	-24	-24	-24	
Calculated Noise Level 1m from NSR	L _p	23	34	29	24	26	23	17	15	30
1no. RXYSCQ4TV1 at 1m	L _w	71	70	67	67	64	56	49	43	68
22m SWL to SPL Distance Correction		-35	-35	-35	-35	-35	-35	-35	-35	
Calculated Noise Level 1m from NSR	L _p	36	36	31	32	29	21	14	8	33
Overall Cumulative SPL at 1m from NSR	L _p	57	57	47	45	42	38	32	28	48
Specific Sound Level										48
Acoustic Feature Correction										3
Rating Level										51
Daytime Rating Level Limit										54
Excess of Rating Level over Daytime Criteria										-3
Excess of Rating Level over Typical Daytime Background Noise Level										-8
Impact										Low



Night-time (23:00 – 07:00)	Unit	Noise Level at Octave Band Centre Frequency (Hz) dB								dBA
		63	125	250	500	1k	2k	4k	8k	
1no. Altherma ERGA06EVA at 1m	L _p	51	53	51	47	43	37	35	23	49
Quantity Correction for 7No.		+8	+8	+8	+8	+8	+8	+8	+8	
22m Distance Correction		-24	-24	-24	-24	-24	-24	-24	-24	
Calculated Noise Level 1m from NSR	L _p	35	37	35	31	27	21	19	7	33
1no. 3MXS52E4V1B2 at 1m	L _p	52	57	50	43	42	40	38	33	49
Quantity Correction for 3No.		+5	+5	+5	+5	+5	+5	+5	+5	
22m Distance Correction		-24	-24	-24	-24	-24	-24	-24	-24	
Calculated Noise Level 1m from NSR	L _p	23	34	29	24	26	23	17	15	30
1no. RXYSCQ4TV1 at 1m	L _w	71	70	67	67	64	56	49	43	68
22m SWL to SPL Distance Correction		-35	-35	-35	-35	-35	-35	-35	-35	
Calculated Noise Level 1m from NSR	L _p	36	36	31	32	29	21	14	8	33
Overall Cumulative SPL at 1m from NSR	L _p	39	41	37	35	32	27	22	16	37
Specific Sound Level										37
Acoustic Feature Correction										3
Rating Level										40
Daytime Rating Level Limit										40
Excess of Rating Level over Criteria										0
Excess of Rating Level over Typical Daytime Background Noise Level										-5
Impact										Low

Our calculations indicate that the proposed mechanical plant items at Westminster House should be capable of achieving the LPA’s plant noise emission criteria outlined in Section 4.0.

5.6 Vibration Isolation

Vibration transfer from building services plant to office floors should not exceed 0.01 m/s² peak acceleration (based on W_b weighting as defined in Clause 3.3 of BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings - Vibration sources other than blasting).

We have been informed all of the proposed plant items will be supported on suitable anti-vibration mounts as necessary to prevent the structural transmission of vibration and regenerated noise within adjacent premises.

It is important that all AVM’s are manufactured in accordance with our “General Specification for Acoustic and Vibration Isolation Materials and Products”.



6.0 Conclusion

Plant noise emission criteria have been recommended based on the results of our previous environmental noise survey with reference to Planning Condition U0182941 imposed by the Local Authority.

Although it is a General Compliance Condition, appropriate mitigation measure in the form of an atmospheric side induct attenuator has been recommended for emergency smoke fan to satisfy Planning Condition U0182940.

An assessment has been carried out to determine the suitability of proposed mechanical plant item services serving the proposed development to the nearest noise sensitive premise in line with Planning Condition U0182941 and BS4142:2014.

Our assessment and calculations, based upon the information provided, indicates the proposed plant items are capable of achieving the LPA's plant noise emission criteria at nearest noise sensitive windows. This assumes any recommendations contained within this report are properly implemented and maintained.

Any deviations from this memorandum must be agreed by, and confirmed in writing to, Hann Tucker Associates.

Yours sincerely

Kyungmin Kim
for HANN TUCKER ASSOCIATES