

Memo

To:	Phil Garner Cancara Property Limited
From:	Louise Alderson Environmental Consultant L A Environmental Ltd
cc:	
Date:	March 9, 2021
Re:	Former Fire Station, Station Road, Fulwell, Sunderland SR6 9AE Planning Ref: 18/01276/FUL

Planning Permission was granted for 28no flats at the above site on 20th December 2019. Condition 12 relates to noise and states that:

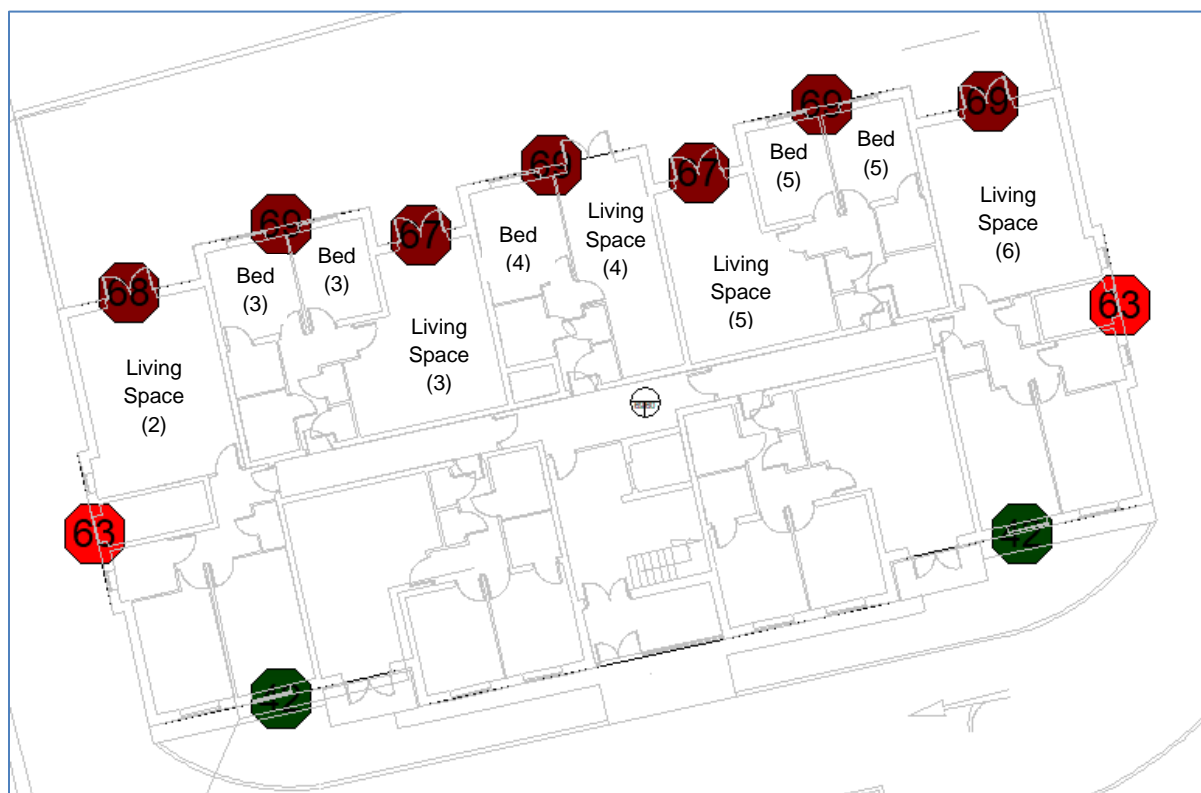
12. Prior to the first occupation of the development (unit 1), the mitigation measures identified in Table 3 of the Noise Assessment Report (ref FH/FFH/001), undertaken by LA Environmental Consultants and dated 6 September 2018, shall be installed in the proposed units with reference to Figure 6 of the report and thereafter maintained for the lifetime of the development to ensure compliance with internal noise criteria as stated in BS8233:2014. Reason: To ensure that a satisfactory level of amenity is provided to occupants of the new dwellings and to accord with policy B2 of the adopted Unitary Development Plan and policy BH1 of the emerging Core Strategy Development Plan.

To ensure a satisfactory level of amenity is provided to future occupants, detailed calculations for each habitable room affected by traffic noise from Station Road has been calculated based on information provided by Cancara Property Limited (appended to this document).

Noise predictions have been carried out using CadnaA computer software that enables accurate modelling of noise. Noise sources are plotted on the proposed site layout using the data measured during the survey. The contribution of noise from road traffic, allowing for distance attenuation and any screening from existing buildings, walls or topography, has then been calculated.

Figure 1 overleaf shows the predicted external façade levels based on the noise survey carried out in August 2018.

Figure 1: Predicted External Façade Levels (dBLAeq,16hr)



*NOTE: (2) = Apartment number

A summary of noise levels at each habitable room, together with room and window dimensions are shown in the table below.

Apartment	Room	External façade level		Room dimensions	Window dimensions
		(LAeq,16hr)	(LAeq,8hr)		
2 & 6 2 Bed – Large	Living Space	68	--	6.202m x 4.625 x 2.4m	1.685m x 2.1m
3 & 5 2 Bed – Standard	Bed 1	69	61	3.197m x 2.80m x 2.4m	1.350m x 1.350m
	Bed 2	69	61	3.197m x 2.55m x 2.4m	1.350m x 1.350m
	Living Space	67	--	5.837m x 3.257 – 5.122 x 2.4m	1.685m x 2.1m
4 1 Bed	Bed	69	61	3.797m x 2.90 x 2.4m	1.685m x 2.1m
	Living Space	69	--	7.187m x 2.90m x 2.4m	1.685m x 2.1m

BS8233:2014 'Guidance on sound insulation and noise reduction for buildings' defines a range of ambient noise levels for design criteria, such that suitable conditions are achieved in certain internal and external environments:

Living Rooms
Bedrooms

LAeq(16hr Daytime) < 35dB(A)
LAeq(8hr Night Time) < 30dB(A)

Calculations shown in the Figure below are all carried out according to the full calculation method of BS8233:2014 (Annex G.2) and are based on the room and window dimensions provided by Cancara Property Limited.

Apartment 2 & 6

Figure 2: Apartment 2 & 6: Living Space

Room/Window Dimensions		Room Acoustics								
		T60	63	125	250	500	1000	2000	4000	
Length	6.202	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Width	4.625	External Spectra @ Façade								
Height	2.4	dB(A)								
		63	125	250	500	1000	2000	4000		
Volume	68.8422	68	78.9	71.9	65.9	64.9	63.9	59.9	52.9	Road
		66	51.1	52.1	48.1	52.1	62.1	62.1	52.1	Rail
		66	69.4	68.4	64.4	60.4	59.4	60.4	57.4	Aircraft
		66	100	100	100	100	100	100	100	Manual
Window Sizes		Roof Sound Insulation dB Dnt								
Width	1.685	63	125	250	500	1000	2000	4000		
Height	2.1	18	21	26	32	32	35	38		1
		20	24	33	39	45	48	51		2
		28	32	39	47	52	58	61		3
		34	38	45	53	58	64	67		4
Window Area	3.5385	100	100	100	100	100	100	100		N/A
Ceiling Area	28.68425									
		Ventilator								
		dBnew								
		63	125	250	500	1000	2000	4000		
		38	19	22	31	38	41	42	45	
Glazing:	8.76 mm / 16 mm / 4 mm									
External Spectra:	Road									
Roof/Ceiling:	Type: 3									
Ventilator:	38	dB(Dnew)								
		dB(Rw)								
Glazing Insulation:		40	21	23	28	37	46	51	51	
		dB(A)								
Calculated Internal Noise:		35.4	33.9	33.8	27.2	24.4	22.1	17.3	7.5	
Noise Reduction		32.6	19.0	22.0	29.7	37.4	41.7	43.5	46.3	

Apartment 3 & 5

Figure 3: Apartment 3 & 5 Bed 1

Room/Window Dimensions		Room Acoustics								
		63	125	250	500	1000	2000	4000		
		T60	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Length	3.197	External Spectra @ Façade								
Width	2.8									
Height	2.4	dB(A)	63	125	250	500	1000	2000	4000	
Volume	21.48384	61	71.9	64.9	58.9	57.9	56.9	52.9	45.9	Road
		66	51.1	52.1	48.1	52.1	62.1	62.1	52.1	Rail
		66	69.4	68.4	64.4	60.4	59.4	60.4	57.4	Aircraft
		66	100	100	100	100	100	100	100	Manual
Window Sizes		Roof Sound Insulation dB Dnt								
Width	1.35	63	125	250	500	1000	2000	4000		
Height	1.35	18	21	26	32	32	35	38	1	
		20	24	33	39	45	48	51	2	
		28	32	39	47	52	58	61	3	
		34	38	45	53	58	64	67	4	
Window Area	1.8225	100	100	100	100	100	100	100	N/A	
Ceiling Area	8.9516									
		Ventilator								
		dBnew	63	125	250	500	1000	2000	4000	
		41	22	25	34	41	44	45	48	
Glazing:	8.76 mm / 16 mm / 4 mm									
External Spectra:	Road									
Roof/Ceiling:	Type: 3									
Ventilator:	41	dB(Dnew)								
		dB(Rw)	63	125	250	500	1000	2000	4000	
Glazing Insulation:		40	21	23	28	37	46	51	51	
		dB(A)	63	125	250	500	1000	2000	4000	
Calculated Internal Noise:		30.1	28.6	28.6	22.0	19.2	16.9	12.3	2.5	
Noise Reduction		30.9	17.3	20.3	27.9	35.7	39.9	41.6	44.4	

Figure 4: Apartment 3 & 5 Bed 2

Room/Window Dimensions		Room Acoustics								
		63	125	250	500	1000	2000	4000		
		T60	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Length	3.197	External Spectra @ Façade								
Width	2.55									
Height	2.4	dB(A)	63	125	250	500	1000	2000	4000	
Volume	19.56564	61	71.9	64.9	58.9	57.9	56.9	52.9	45.9	Road
		66	51.1	52.1	48.1	52.1	62.1	62.1	52.1	Rail
		66	69.4	68.4	64.4	60.4	59.4	60.4	57.4	Aircraft
		66	100	100	100	100	100	100	100	Manual
Window Sizes		Roof Sound Insulation dB Dnt								
Width	1.35	63	125	250	500	1000	2000	4000		
Height	1.35	18	21	26	32	32	35	38	1	
		20	24	33	39	45	48	51	2	
		28	32	39	47	52	58	61	3	
		34	38	45	53	58	64	67	4	
Window Area	1.8225	100	100	100	100	100	100	100	N/A	
Ceiling Area	8.15235									
		Ventilator								
		dBnew	63	125	250	500	1000	2000	4000	
		41	22	25	34	41	44	45	48	
Glazing:	8.76 mm / 16 mm / 4 mm									
External Spectra:	Road									
Roof/Ceiling:	Type: 3									
Ventilator:	41	dB(Dnew)								
		dB(Rw)	63	125	250	500	1000	2000	4000	
Glazing Insulation:		40	21	23	28	37	46	51	51	
		dB(A)	63	125	250	500	1000	2000	4000	
Calculated Internal Noise:		30.5	28.9	29.0	22.3	19.5	17.3	12.7	2.9	
Noise Reduction		30.5	17.0	19.9	27.6	35.3	39.6	41.2	44.0	

Figure 5: Apartment 3 & 5 – Living Space

Room/Window Dimensions		Room Acoustics								
		63	125	250	500	1000	2000	4000		
		T60	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Length	5.837									
Width	4.1895									
Height	2.4									
		External Spectra @ Façade								
		dB(A)	63	125	250	500	1000	2000	4000	
Volume	58.68987	67	77.9	70.9	64.9	63.9	62.9	58.9	51.9	Road
		66	51.1	52.1	48.1	52.1	62.1	62.1	52.1	Rail
		66	69.4	68.4	64.4	60.4	59.4	60.4	57.4	Aircraft
		66	100	100	100	100	100	100	100	Manual
Window Sizes										
		Roof Sound Insulation dBnt								
Width	1.685	63	125	250	500	1000	2000	4000		
Height	2.1	18	21	26	32	32	35	38	1	
		20	24	33	39	45	48	51	2	
Window Area	3.5385	28	32	39	47	52	58	61	3	
		34	38	45	53	58	64	67	4	
Ceiling Area	24.45411	100	100	100	100	100	100	100	N/A	
		Ventilator								
		dBnew	63	125	250	500	1000	2000	4000	
		38	19	22	31	38	41	42	45	
Glazing:	8.76 mm / 16 mm / 4 mm									
External Spectra:	Road									
Roof/Ceiling:	Type: 3									
Ventilator:	38 dB(Dnew)									
		dB(Rw)	63	125	250	500	1000	2000	4000	
Glazing Insulation:	40		21	23	28	37	46	51	51	
		dB(A)	63	125	250	500	1000	2000	4000	
Calculated Internal Noise:	34.9		33.4	33.4	26.8	24.0	21.7	17.0	7.2	
Noise Reduction	32.1		18.5	21.5	29.1	36.9	41.1	42.9	45.7	

Apartment 4

Figure 6: Apartment 4 - Bed

Room/Window Dimensions		Room Acoustics								
		63	125	250	500	1000	2000	4000		
		T60	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Length	3.797	External Spectra @ Façade								
Width	2.9									
Height	2.4									
		dB(A)	63	125	250	500	1000	2000	4000	
Volume	26.42712	61	71.9	64.9	58.9	57.9	56.9	52.9	45.9	Road
		66	51.1	52.1	48.1	52.1	62.1	62.1	52.1	Rail
		66	69.4	68.4	64.4	60.4	59.4	60.4	57.4	Aircraft
		66	100	100	100	100	100	100	100	Manual
Window Sizes		Roof Sound Insulation dB Dnt								
Width	1.685	63	125	250	500	1000	2000	4000		
Height	2.1	18	21	26	32	32	35	38	1	
		20	24	33	39	45	48	51	2	
		28	32	39	47	52	58	61	3	
Window Area	3.5385	34	38	45	53	58	64	67	4	
Ceiling Area	11.0113	100	100	100	100	100	100	100	N/A	
		Ventilator								
		dBnew	63	125	250	500	1000	2000	4000	
		41	22	25	34	41	44	45	48	
Glazing:	8.76 mm / 16 mm / 4 mm									
External Spectra:	Road									
Roof/Ceiling:	Type: 3									
Ventilator:	41	dB(Dnew)								
		dB(Rw)	63	125	250	500	1000	2000	4000	
Glazing Insulation:		40	21	23	28	37	46	51	51	
		dB(A)	63	125	250	500	1000	2000	4000	
Calculated Internal Noise:		30.2	28.4	28.5	22.4	19.4	16.5	11.6	1.9	
Noise Reduction		30.8	17.5	20.3	27.4	35.5	40.4	42.3	44.9	

Figure 7: Apartment 4 – Living Space

Room/Window Dimensions		Room Acoustics								
		63	125	250	500	1000	2000	4000		
		T60	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Length	7.187	External Spectra @ Façade								
Width	2.9									
Height	2.4									
		dB(A)	63	125	250	500	1000	2000	4000	
Volume	50.02152	69	79.9	72.9	66.9	65.9	64.9	60.9	53.9	Road
		66	51.1	52.1	48.1	52.1	62.1	62.1	52.1	Rail
		66	69.4	68.4	64.4	60.4	59.4	60.4	57.4	Aircraft
		66	100	100	100	100	100	100	100	Manual
Window Sizes		Roof Sound Insulation dB Dnt								
Width	1.685	63	125	250	500	1000	2000	4000		
Height	2.1	18	21	26	32	32	35	38	1	
		20	24	33	39	45	48	51	2	
		28	32	39	47	52	58	61	3	
Window Area	3.5385	34	38	45	53	58	64	67	4	
Ceiling Area	20.8423	100	100	100	100	100	100	100	N/A	
		Ventilator								
		dBnew	63	125	250	500	1000	2000	4000	
		42	23	26	35	42	45	46	49	
Glazing:	8.76 mm / 16 mm / 4 mm									
External Spectra:	Road									
Roof/Ceiling:	Type: 3									
Ventilator:	42	dB(Dnew)								
		dB(Rw)	63	125	250	500	1000	2000	4000	
Glazing Insulation:		40	21	23	28	37	46	51	51	
		dB(A)	63	125	250	500	1000	2000	4000	
Calculated Internal Noise:		35.4	33.7	33.7	27.8	24.7	21.6	16.2	6.6	
Noise Reduction		33.6	20.1	23.1	30.0	38.2	43.3	45.7	48.3	

The table below details the proposed configurations of sound insulation enhancements for this development.

Apartment	Room	External façade level		Guidance Criteria		Proposed Mitigation	
		Daytime (LAeq,16hr)	Night time (LAeq,8hr)	Day	Night	Glazing 8.76mm LamiGlass Sound Reduction/16mm Cavity/4mm Float Glass	Ventilation Requirements Acoustic Dnew
2 & 6 2 Bed – Large	Living Space	68	--	35	--	40Rw	38
3 & 5 2 Bed – Standard	Bed 1	69	61	--	30	40Rw	41
	Bed 2	69	61	--	30	40Rw	41
	Living Space	67	--	35	--	40Rw	38
4 1 Bed	Bed	69	61	--	30	40Rw	41
	Living Space	69	--	35	--	40Rw	42

The attached literature provides details of the proposed glazing and ventilation. The Linkvent MkII 5000 vent shown below, when closed, achieves an acoustic reduction of 43dB Dnew and therefore meets the acoustic requirements for all habitable rooms. However, when vents are opened for ventilation purposes the acoustic performance reduces to 35dB Dnew and therefore internal noise levels would slightly exceed the guidance criteria.

LINKVENT Mk II 5000

5000 VENT

Equivalent Area 5000mm² EQA Free Area 5049mm² Acoustic D_{n,e,w} (+/-) - vent open 35(0;1) Acoustic D_{n,e,w} (+/-) - vent closed 43(0;0)

Internal				External								Ventilator			
Ventilator				Canopy				Grille (Timber, Sliding door, Sash)				Ventilator			
H (mm)	L (mm)	D (mm)	Weight (gram)	H (mm)	L (mm)	D (mm)	Weight (gram)	H (mm)	L (mm)	D (mm)	Weight (gram)	Attachment type	Rout H (mm)	Rout L (mm)	Stand W (mm)
18.5	454.5	15	60	18.5	454.5	25	49	26	436	2.5	20	Clip or Screw	13	422	14

The advice provided in BS8233 states that where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved. It is therefore considered that noise levels up to 40dB LAeq during the day in living spaces and 35dB LAeq at night in bedrooms would be considered reasonable.

Recommendations are limited to the acoustic performance only and do not address the suitability of any vent for ventilation purposes which would have to be confirmed by a specialist in this field.

If any further information is required please do not hesitate to contact me.

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