External Noise Ingress calculation to BS EN ISO 12354-3 'Airborne sound insulation against outdoor sound'

June 2023
Project: P20-540 - Former Manchester College Site, Northenden
Plot: 104
House Type: Gaskell
Room: Bedroom 2
Period: Night

Description	Term/Unit	Value
Room height	m	2.4
Room floor area	m^2	10.8
Room volume	m^3	25.9
Reference reverberation time	T0 (s)	0.5
Reference total absorption area	A0	10
Total facade surface area of room	m^2	10.8
Total glazing surface area	m^2	2.7
Surface area of duct opening	m^2	0.18

		Octave Band Centre Frequency [Hz]							
	Term/Unit	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
Wall sound reduction index (Standard BS 8233 values)	dB R	36	40	44	45	51	56	60	60
Glazing sound reduction index (Guardian Glass 8.76 (44.2) LamiGlass Sound Recution - 14mm cavity - 6mm Float Glass)	dB R	23	26	30	38	47	45	57	40
Acoustic trickle vent element normalised sound level difference	dB Dn,e	31	41	42	37	43	45	41	40
Loss due to vent exhaust termination size (BS EN ISO 12354-3:2017: D1)	dB	18	18	18	18	18	18	18	18
Loss due to closed backdraught shutter - 0.55mm galvanised steel - (Flakt Woods 2005: Appendix B)	dB	3	8	14	20	23	26	27	35
Insertion loss of acoustic linned flexi-duct (125mm Venta Axia Data)	dB	6	12	17	20	19	26	20	22
Reflection loss at intake termination in room (Flakt Woods 2005: Fig. 5.7)	dB	23	17	11	6	2	0	0	0
Estimated element normalised sound level difference of noise ingress path through open duct system	dB Dn,e	49	54	60	63	62	69	65	74
Apparent sound reduction index (BS EN ISO 12354-3:2017: 7, 8 & 1)	dB R'	25	31	34	34	40	42	38	37
Standardized level difference (BS EN ISO 12354-3:2017: 4)	dB D2m,nT	24	29	33	33	39	41	37	36

		Octave Band Centre Frequency [Hz]								
	Term/Unit	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**A**
Highest anticipated external night time noise level	dB LAeq,8h	67	59	50	56	58	50	40	33	60
Highest anticipated external night time noise level	dB LAmax	79	71	63	67	64	57	55	50	68
Indoor sound level, including +3dB facade correction (BS EN ISO 12354-3:2017: E2)	dB LAeq,8h	46	33	20	26	22	12	6	0	27
Indoor sound level, including +3dB facade correction (BS EN ISO 12354-3:2017: E2)	dB LAmax	58	45	33	37	28	19	21	17	38
BS 8233 criterion under normal conditions	dB LAeq,8h									30
BS 8233 criterion under normal conditions	dB LAmax									45
Excess of indoor sound level over criterion	dB									-3
Excess of indoor sound level over criterion	dB									-7