Acoustic Calculation Services

At **3D Design and Construction**, we specialize in delivering accurate and project-specific **acoustic calculations** to ensure spaces meet the highest standards for sound performance, comfort, and compliance. Our approach combines technical expertise with practical solutions across architecture, engineering, and interior environments.

1. Room Acoustics

Objective:

Enhance sound quality and speech clarity within enclosed spaces.

Key Metrics:

- **Reverberation Time (RT60)** Measures how long sound lingers in a space.
- Speech Transmission Index (STI) Evaluates intelligibility of speech.
- Clarity Index (C50/C80) Assesses clarity for speech (C50) and music (C80).

Applications:

- Auditoriums & Theatres
- Cinemas & Home Cinemas
- Lecture halls
- Classrooms
- Recording and broadcast studios

2. Sound Insulation

Objective:

Control and reduce sound transmission between rooms or structural elements.

Key Metrics:

- Sound Transmission Class (STC) Rates airborne sound insulation.
- Impact Insulation Class (IIC) Measures resistance to structure-borne noise.

Applications:

- Residential complexes
- Hotels and hospitality projects
- Healthcare facilities
- Office environments

3. Vibration Analysis

Objective:

Analyze and manage structural or ground-borne vibrations that affect sensitive environments.

Key Metrics:

- Natural Frequency Determines resonance behavior of building components.
- Vibration Transmissibility Evaluates how much vibration is transferred.
- **Damping Ratio** Measures how quickly vibrations subside.

Applications:

- Buildings near railways or highways
- Scientific laboratories
- Concert halls and performance venues

4. Mechanical Noise Control

Objective:

Mitigate noise generated by HVAC systems, pumps, generators, and other mechanical equipment.

Key Metrics:

- Insertion Loss Reduction in noise after treatment.
- Noise Criteria (NC) Rates background noise levels in occupied spaces.
- Room Criteria (RC) Assesses low-frequency noise impact.

Applications:

- Commercial and mixed-use buildings
- Data centers
- Hospitals and medical centers
- Industrial facilities

Why Choose Us?

We work hand-in-hand with architects, MEP consultants, and project managers to integrate acoustic strategies early in the design process. Our calculations are based on **international standards and modeling software**, ensuring reliable results and optimal acoustic comfort.

Whether you're building a serene residential space or a world-class auditorium, our **acoustic consulting and calculation services** deliver precision, performance, and peace of mind.

Get in touch with us today to discuss your project needs or request a tailored acoustic assessment.

Floating wall calculation

SEEF TERRACES													
Floating Wall Calculations - 19th Floor - Mecha Nuise Sources: Axial Fam	nical Rooms												
Octave Mid-Band Frequencies - Hz	تە	125	250	500	1909	2000	4309	8098	Retmorks	References			
Casing radiated sound power- dB	101	94	97	194	107	106	208	92	Manufacture Sound Power Level Data	Page 1			
Sound reduction index of Partition - R (dB)	- 37	- 17	- 39	- 45	- 49	- 53	- 57	- 61	450 mm Block Wall - Table 5-2 (Houver & Keith Book)	Page 2			
Atra of slab (Sp)	12	M2	8										
10 Log Sp - dft	11	Ū.	- 11;	$\gtrsim 11$	10	11	.0	н	ASHRAE 2009 - 8 11, SPL2 - SPL1-	Page In & Ib			
10 Log A - dB	-4	-4	-5	3	3	-1		-6	R=10LogSp-10LogA				
Absorptive parada	÷ (1)	- 3	- 4	- 4	- 5	- 3	. 5	- 3	50% of walls and ceiling area to be own	to be orwend with Kinetics 50mm KNP Style Panels			
Resultant Sound pressure level - dB	69	61	60	69	59	53	13	л					
NC adjacent Bed Room				NC 5	5+24B								
Additional Attenuation Floating Wall - dB	10	11	0	- 11	12	13	13	В	Two layers of 12mm Thick Gypsian B 50mm thick 32kg/m3 density Invalation	ored System with Kinetics ISOMAX with			
Resultant Sound pressure lovel achieved (with Flouting Wall) - dB	00	50	425	49	47	41	30	18	at Adjacent Bedroom with Floating Wa	II & 50% Wall Lining			
NC Achieved (with Floating Wall)		, î		N	C 45		·						
Design Target - NC 35	60	52	46	40	37	34	32	31					
Netr:	-												
1. Units must be placed on the vibration isolators as	s per the ASI	IRAE sam	dard guis	felines, /	ASHRAF	2007-07	IAPTER	47, TABL	E.48)				
2 Any MEP service penetrations must be acoustica	illy treated as	per the AS	HIRAE (tandard	guidelin	es (ASHR/	UE 2007 -	CHAPTE	R 47, FIOURE 29)				
3. Accuracy of the evaluation is totally based on the	equipment -	ound data,	any dev	istim in	cround d	ana will dri	istically in	strease the	sound level at site.				

Floating floor calculation

Sound Transmission to the below areas

Plant room Reference: AHUs at Roof Level

Receiver Room: Bedroom / Living Room

Noise Sources - FAHU 1

OCTAVE BAND FREQUENCY	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	BKHz			
Supply Air SWL	95	97	91	88	88	86	81	76	From technical Data Sheets		
Exhaust Air SWL	84	84	80	80	80	77	75	72	From technical Data Sheets		
Total	95	97	91	89	89	87	82	π	Addition of SWLs		
Casing Attenuation	8	12	17	25	30	30	30	30			
Add 3 dB safety	3	3	3	3	3	3	3	3			
SWL Used in Calculations	90	88	77	67	62	60	55	50			
SPL near Critical Partition - SPL 1	87	85	74	63	58	56	51	47			
TL of Slab - dB	36	37	43	47	50	54	58	62	R		
TL of System with FF	- 44	47	55	62	67	71	75	79	R		
Attenuation due to Source Room	-4	-4	-4	-4	-4	-4	-4	-4			
10 Log Sp	12	12	12	12	12	12	12	12			
10 Log A	9	10	11	11	12	10	11	12			
SPL other Side of Partition - SPL 2 without FF	54	49	32	-17	8	3	0	0	SPL2 = SPL1-R+10LogSp-10LogA		
SPL other Side of Partition - SPL 2' with FF	46	39	20	2	0	0	0	0	SPL2' = SPL1-R'+10LogSp-10LogA		
Recommended Noise Levels		NC 30									
Achieved Noise Levels without Floating Floor		NC 30 + 1									
Achieved Noise Levels without Floating Floor		NC 20									

RT60 calculation

RT Calculations

Room Reference Studio 5 FF A*A/3-11

Room Geometry

Room Areas

Length	5.435	м
Width	4	M
Height	4	М
Volume	86.96	M ₃

C

	Wall 1	21.74	M ²
	Wall 2	21.74	M2
	Wall 3	16	M2
	Wall 4	16	M ²
	Floor	21.74	M ²
	Ceiling	21.74	M ²
Total:	Surface Area	118.96	M ²

Area (M ²)	Finish			Sabines @ Octave Band Frequency								
			63	125	250	500	1000	2000	4000	8000		
0	Brickwork.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
0	Concrete	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
0	Up to 4 mm glass			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	6 mm plate glass			0.16	0.30	0.12	0.08	0.06	0.04	0.04	0.04	
0	Marble or Glazed Tiles	5		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	Plaster on solid wall			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	Water			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	Curtains in folds again	st wall		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	Acoustic Wall Panels	3	25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
34	CONTRACTOR CONTRACTOR		50	3.40	10.20	20.40	30.60	34.00	34.00	34.00	34.00	
0		1	00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
37	12 Plaster Board on battens and infill				11.10	7.40	5.55	1.85	1.85	1.85	1.85	
21.74	4 Suspended plasterboard (large airspace)				4.35	3.26	2.17	1.09	1.09	1.09	1.09	
2.42	Wooden Panel / Door			0.48	0.68	0.53	0.41	0.22	0.24	0.27	0.24	
0	Acoustic Tiles	Class A		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	1.1.00000000000000000000000000000000000	Class B		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0		Class C		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	Acoustic Banners	Vinyl		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	Proceeding and the second second	Sail Cloth	i i	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	Rubber Floor Tiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
0	Thick pile carpet on so	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
0	Medium pile carpet on	sponge rubber	r underlay	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
21.74	Haircord carpet on felt	underlay		1.09	1.09	1.09	2.17	4.35	9.78	14.13	14,13	
0	Tiles / Marble			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	Wood parguet			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	Empty fully upholstered seat Empty seat			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	Adult Person			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	Child			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	0 Wooden Furniture			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Total S.	18.7	27.7	32.8	41.0	41.6	47.0	51.4	51,4	
			RTm	0.7	0.5	0.4	0.3	0.3	0.3	0.3	0.3	