

PARTICLE STUDIO
PORTLAND
SOUND REPORT

Particletm
Studios

OVERVIEW

This sound report measures noise curves to assess external noises within the studio. A major finding from the sound report was that individual noises like trains, horns, shouting, motorcycles, and airplanes are improved by 30dB across the audible frequency range and over 40dB in some ranges. This outstanding improvement in sound performance was achieved via a retrofit of the building envelope using industry-standard techniques and materials such as mass-loaded vinyl, industrial-grade rockwool, air gaps, and staggered studs.

The findings below are the average and maximum noise levels of the original building compared to the noise levels after the soundproof studio was constructed.

MAJOR FINDINGS

- 🔊 × Reduced noise by **40 dB+**
- 🔊 Average noise levels in-studio = **Empty concert hall**
- 🔊 Max noise levels in-studio = **A small church**



Sound level meter in Particle Studio Portland.

RECOMMENDED SOUND CRITERIA FOR VARIOUS UNOCCUPIED ROOMS:

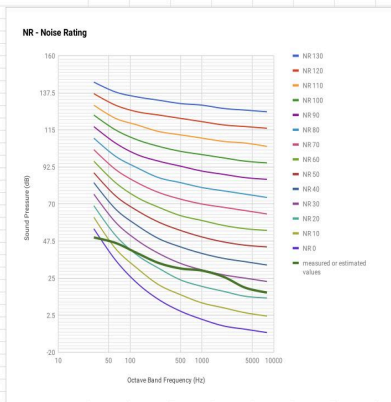
These are the recommended criteria for various unoccupied rooms:

Type of Room	Sound Level LAeq	NC and RNC Curve	RC Mark Criteria
Concert and recital halls	-	15-18	-
Small auditoriums (≤500 seats)	35-39	25-30	-
Large auditoriums (>500 seats)	30-35	20-25	-
TV and broadcast studios	16-35	15-25	-
Live performance theaters	25-30	20-25	-
Premier movie theaters	25-30	20-25	-
Normal theater	30	25	-
Private residences			
• Bedrooms	35-39	25-30	25-30(N)
• Apartments	39-48	30-40	30-35 (N)
• Family rooms and living rooms	39-48	30-40	30-35 (N)
Churches small	39-44	30-35	25-35 (N)
Courtrooms	39-44	30-35	25-35 (N)
Libraries	44-48	35-40	30-40 (N)
Restaurants	48-52	40-45	-
Control rooms, kitchens, and laundries	52-62	45-55	-
Shops and garages	57-67	50-60	-

AVERAGE NOISE LEVELS BEFORE AND AFTER SOUNDPROOFING:

BEFORE - LZeq 28

	Octave Band Center Frequency (Hz)								
	31.25	62.5	125	250	500	1000	2000	4000	8000
NR 130	144	138	135	133	131	130	128	127	126
NR 120	137	130	128	124	122	120	118	117	116
NR 110	130	122	118	114	112	110	108	107	105
NR 100	124	115	109	105	102	100	98	96	95
NR 90	117	107	100	96	93	90	88	86	85
NR 80	110	99	92	86	83	80	78	76	74
NR 70	103	91	83	77	73	70	68	66	64
NR 60	96	83	74	68	63	60	57	55	54
NR 50	89	75	66	59	54	50	47	45	44
NR 40	83	67	57	49	44	40	37	35	33
NR 30	76	59	48	40	34	30	27	25	23
NR 20	69	51	39	31	24	20	17	14	13
NR 10	62	43	31	21	15	10	7	4	2
NR 0	55	36	22	12	5	0	-4	-6	-8
measured or estimated values	49.7	46.4	40.2	34.2	30.9	29.6	25.8	19.2	16.3

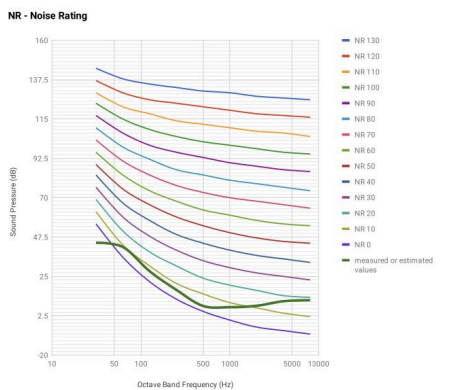


I've recorded audio for high-end clients in most, if not all of the professional studios in town. Sensitive microphones record the subject and the acoustics of a room. Particle is a large, open space but sounded great. The forethought in construction and acoustic design was obvious to my ears. I'm ready to go back.

Sam Curtis
AUDIO CONSULTANT, SOUND CONNECTIONS INTL LLC

AFTER - LZeq 19

	Octave Band Center Frequency (Hz)								
	31.25	62.5	125	250	500	1000	2000	4000	8000
NR 130	144	138	135	133	131	130	128	127	126
NR 120	137	130	126	124	122	120	118	117	116
NR 110	130	122	118	114	112	110	108	107	105
NR 100	124	115	109	105	102	100	98	96	95
NR 90	117	107	100	96	93	90	88	86	85
NR 80	110	99	92	86	83	80	78	76	74
NR 70	103	91	83	77	73	70	68	66	64
NR 60	96	83	74	68	63	60	57	55	54
NR 50	89	75	66	59	54	50	47	45	44
NR 40	83	67	57	49	44	40	37	35	33
NR 30	76	59	48	40	34	30	27	25	23
NR 20	69	51	39	31	24	20	17	14	13
NR 10	62	43	31	21	15	10	7	4	2
NR 0	55	36	22	12	5	0	-4	-6	-8
measured or estimated values	44.2	41.8	28	17.3	8.1	7.4	8.2	10.8	11.4



AVERAGE NOISE LEVELS AFTER SOUNDPROOFING

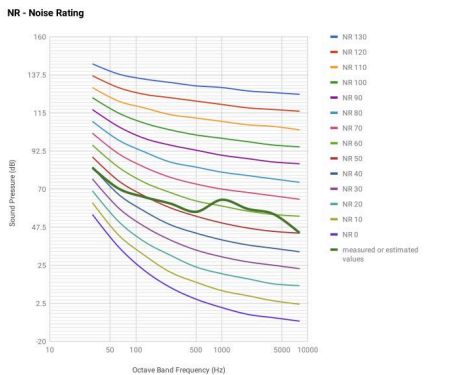
=

EMPTY CONCERT HALL

MAXIMUM NOISE LEVELS BEFORE AND AFTER SOUNDPROOFING:

BEFORE - Lmax 62

	Octave Band Center Frequency (Hz)								
	31.25	62.5	125	250	500	1000	2000	4000	8000
NR 130	144	138	135	133	131	130	128	127	126
NR 120	137	130	126	124	122	120	118	117	116
NR 110	130	122	118	114	112	110	108	107	105
NR 100	124	115	109	105	102	100	98	96	95
NR 90	117	107	100	96	93	90	88	86	85
NR 80	110	99	92	86	83	80	78	76	74
NR 70	103	91	83	77	73	70	68	66	64
NR 60	96	83	74	68	63	60	57	55	54
NR 50	89	75	66	59	54	50	47	45	44
NR 40	83	67	57	49	44	40	37	35	33
NR 30	76	59	48	40	34	30	27	25	23
NR 20	69	51	39	31	24	20	17	14	13
NR 10	62	43	31	21	15	10	7	4	2
NR 0	55	36	22	12	5	0	-4	-6	-8
measured or estimated values	82.6	78.4	65.3	61.5	56.6	63.7	58.3	55.2	44.1

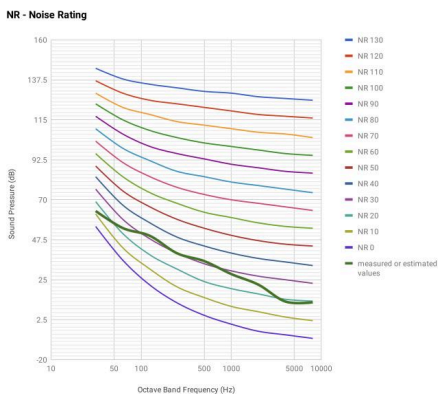


The max noise rating was reduced by 30dB after a retrofit of the building envelope using industry-standard techniques and materials such as mass-loaded vinyl, industrial-grade rockwool, air gaps, and staggered studs.

Soundproofing the original building reduced max noise levels from a loud shop or garage (Lmax 62) to a small church (Lmax 32).

AFTER - Lmax 32

	Octave Band Center Frequency (Hz)								
	31.25	62.5	125	250	500	1000	2000	4000	8000
NR 130	144	138	135	133	131	130	128	127	126
NR 120	137	130	126	124	122	120	118	117	116
NR 110	130	122	118	114	112	110	108	107	105
NR 100	124	115	109	105	102	100	98	96	95
NR 90	117	107	100	96	93	90	88	86	85
NR 80	110	99	92	86	83	80	78	76	74
NR 70	103	91	83	77	73	70	68	66	64
NR 60	96	83	74	68	63	60	57	55	54
NR 50	89	75	66	59	54	50	47	45	44
NR 40	83	67	57	49	44	40	37	35	33
NR 30	76	59	48	40	34	30	27	25	23
NR 20	69	51	39	31	24	20	17	14	13
NR 10	62	43	31	21	15	10	7	4	2
NR 0	55	36	22	12	5	0	-4	-6	-8
measured or estimated values	63.7	54.1	49.7	39.9	35.5	28.2	22.2	12.7	12.3



MAX NOISE LEVELS AFTER SOUNDPROOFING

=

A SMALL CHURCH



Particle is doing things the right way. The time and attention they spent making a proper sound stage helps ensure a great mix every time. Particle Portland is the quietest stage I've experienced in the Pacific Northwest. **It's theater-level quiet in there.**

Jeremiah Sheets

AUDIO RECORDIST

PARTICLE STUDIO
PORTLAND
SOUND REPORT

2029 SE 9th Ave Portland, OR 97124
www.particlestudios.com/portland

