Leppämäki

- Voimalapaikka
- Etäisyysvyöhyke Leppämäen voimaloista
- Leppäkankaan voimala
- Melutarkastelupiste (A-J)

Rakennuspisteet

- Asuinrakennus
- Lomarakennus
- Asuntolarakennus
- Muu rakennus
- Rakennus, jonka käyttötarkoitus on muuttumassa

Äänitaso (dB(A))

- 35-40
- 40-45
- 45-50
- 50-55

SWECO

0 1 2 km

MML Maastokartta WMTS 2025

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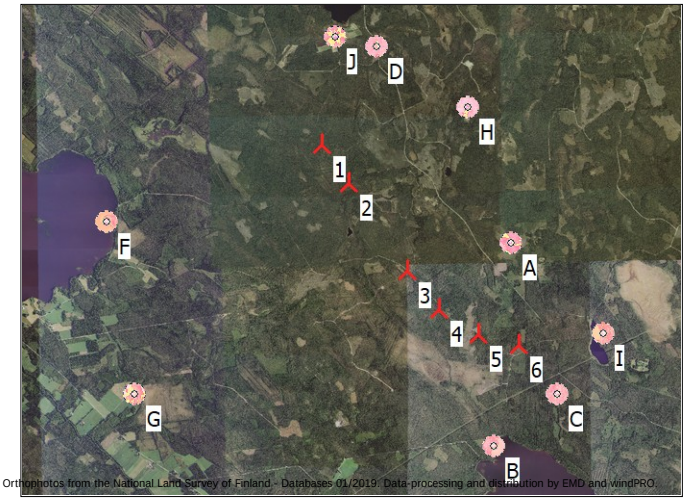
Calculated:
8/29/2025 11:23 AM/4.1.287

DECIBEL - Main Result

Calculation: Leppämäki_melumallinnus_29082025

Calculation is done according to Finnish guideline " Ympäristöhallinnon ohjeita 2 | 2014 " from the Ministry of the Environment of Finland

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89



WTGs

	East	North	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Noise data Creator	Name	Wind speed	LwA,ref	Uncertainty
			[m]					[kW]	[m]	[m]			[m/s]	[dB(A)]	[dB(A)]
1	441,867	7,040,011	152.0	NORDEX N163/6.X 7000 163...	Yes	NORDEX	N163/6.X-7,000	7,000	163.0	190.0	USER	Mode 0 - without serrated trailing edge	8.0	109.4	2.0
2	442,303	7,039,356	154.4	NORDEX N163/6.X 7000 163...	Yes	NORDEX	N163/6.X-7,000	7,000	163.0	190.0	USER	Mode 0 - without serrated trailing edge	8.0	109.4	2.0
3	443,255	7,037,904	177.4	NORDEX N163/6.X 7000 163...	Yes	NORDEX	N163/6.X-7,000	7,000	163.0	190.0	USER	Mode 0 - without serrated trailing edge	8.0	109.4	2.0
4	443,774	7,037,232	168.1	NORDEX N163/6.X 7000 163...	Yes	NORDEX	N163/6.X-7,000	7,000	163.0	190.0	USER	Mode 0 - without serrated trailing edge	8.0	109.4	2.0
5	444,415	7,036,812	170.3	NORDEX N163/6.X 7000 163...	Yes	NORDEX	N163/6.X-7,000	7,000	163.0	190.0	USER	Mode 0 - without serrated trailing edge	8.0	109.4	2.0
6	445,072	7,036,630	171.8	NORDEX N163/6.X 7000 163...	Yes	NORDEX	N163/6.X-7,000	7,000	163.0	190.0	USER	Mode 0 - without serrated trailing edge	8.0	109.4	2.0

Calculation Results

Sound level

Noise sensitive area No.	Name	East	North	Z	Immission height	Sound level From WTGs	Uncertainty margin	WTG+Uncertainty margin	2 dB penalty applied for one or more WTGs
				[m]	[m]	[dB(A)]	[dB]	[dB(A)]	
A	A.	444,988	7,038,334	200.0	4.0	35.9	2.0	37.9	No
B	B.	444,643	7,034,956	156.3	4.0	33.0	2.0	35.0	No
C	C.	445,720	7,035,802	166.2	4.0	36.7	2.0	38.7	No
D	D.	442,804	7,041,603	156.4	4.0	31.0	2.0	33.0	No
F	F.	438,273	7,038,791	125.5	4.0	23.6	2.0	25.6	No
G	G.	438,673	7,035,925	135.3	4.0	22.2	2.0	24.2	No
H	H.	444,304	7,040,581	226.3	4.0	30.4	2.0	32.4	No
I	I.	446,482	7,036,796	171.1	4.0	34.4	2.0	36.4	No
J	J.	442,116	7,041,782	147.6	4.0	30.9	2.0	32.9	No

Distances (m)

	WTG					
NSA	1	2	3	4	5	6
A	3543	2873	1786	1640	1626	1706
B	5767	4984	3258	2436	1870	1728
C	5706	4930	3240	2415	1650	1051
D	1847	2302	3726	4477	5055	5466
F	3795	4069	5060	5718	6453	7134
G	5186	4995	4991	5266	5810	6438
H	2503	2346	2875	3391	3771	4025
I	5624	4901	3412	2743	2067	1420
J	1788	2433	4041	4842	5475	5939

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8/29/2025 11:23 AM/4.1.287

DECIBEL - Detailed results

Calculation: Leppämäki_melumallinnus_29082025 Noise calculation model: ISO 9613-2:2024 Finland 8.0 m/s

Assumptions

Calculated L(DW) = LWA,ref + K + Dc - (Adiv + Aatm + Agr + Abar + Amisc) - Cmet
(when calculated with ground attenuation, then Dc = Domega)

LWA,ref:	Sound pressure level at WTG
K:	Pure tone
Dc:	Directivity correction
Adiv:	the attenuation due to geometrical divergence
Aatm:	the attenuation due to atmospheric absorption
Agr:	the attenuation due to ground effect
Abar:	the attenuation due to a barrier
Amisc:	the attenuation due to miscellaneous other effects
Cmet:	Meteorological correction

Calculation Results

Noise sensitive area: A A.

Wind speed: 8.0 m/s

WTG No.	Distance	Sound distance	Penalty	From WTGs	Uncertainty margin	WTG+Uncertainty margin	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A
	[m]	[m]	[dB]	[dB(A)]	[dB]	[dB]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	3,543	3,546	0	20.00	2.00	22.00	109.4	0.00	81.99	-	-	0.00	0.00	-
2	2,873	2,876	0	22.77	2.00	24.77	109.4	0.00	80.18	-	-	0.00	0.00	-
3	1,786	1,793	0	28.84	2.00	30.84	109.4	0.00	76.07	-	-	0.00	0.00	-
4	1,640	1,647	0	29.90	2.00	31.90	109.4	0.00	75.33	-	-	0.00	0.00	-
5	1,626	1,634	0	30.00	2.00	32.00	109.4	0.00	75.26	-	-	0.00	0.00	-
6	1,706	1,713	0	29.41	2.00	31.41	109.4	0.00	75.68	-	-	0.00	0.00	-
Sum						37.91								

- Data undefined due to calculation with octave data

Noise sensitive area: B B.

Wind speed: 8.0 m/s

WTG No.	Distance	Sound distance	Penalty	From WTGs	Uncertainty margin	WTG+Uncertainty margin	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A
	[m]	[m]	[dB]	[dB(A)]	[dB]	[dB]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	5,767	5,770	0	13.43	2.00	15.43	109.4	0.00	86.22	-	-	0.00	0.00	-
2	4,984	4,987	0	15.41	2.00	17.41	109.4	0.00	84.96	-	-	0.00	0.00	-
3	3,258	3,265	0	21.10	2.00	23.10	109.4	0.00	81.28	-	-	0.00	0.00	-
4	2,436	2,444	0	24.89	2.00	26.89	109.4	0.00	78.76	-	-	0.00	0.00	-
5	1,870	1,881	0	28.24	2.00	30.24	109.4	0.00	76.49	-	-	0.00	0.00	-
6	1,728	1,740	0	29.24	2.00	31.24	109.4	0.00	75.81	-	-	0.00	0.00	-
Sum						35.01								

- Data undefined due to calculation with octave data

Noise sensitive area: C C.

Wind speed: 8.0 m/s

WTG No.	Distance	Sound distance	Penalty	From WTGs	Uncertainty margin	WTG+Uncertainty margin	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A
	[m]	[m]	[dB]	[dB(A)]	[dB]	[dB]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	5,706	5,709	0	13.57	2.00	15.57	109.4	0.00	86.13	-	-	0.00	0.00	-
2	4,930	4,933	0	15.55	2.00	17.55	109.4	0.00	84.86	-	-	0.00	0.00	-
3	3,240	3,246	0	21.17	2.00	23.17	109.4	0.00	81.23	-	-	0.00	0.00	-
4	2,415	2,422	0	25.01	2.00	27.01	109.4	0.00	78.68	-	-	0.00	0.00	-
5	1,650	1,661	0	29.79	2.00	31.79	109.4	0.00	75.41	-	-	0.00	0.00	-
6	1,051	1,069	0	35.13	2.00	37.13	109.4	0.00	71.58	-	-	0.00	0.00	-
Sum						38.74								

- Data undefined due to calculation with octave data

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Calculated:
8/29/2025 11:23 AM/4.1.287

DECIBEL - Detailed results

Calculation: Leppämäki_melumallinnus_29082025 Noise calculation model: ISO 9613-2:2024 Finland 8.0 m/s

Noise sensitive area: D D.

Wind speed: 8.0 m/s
WTG

No.	Distance	Sound distance	Penalty	From WTGs	Uncertainty margin	WTG+Uncertainty margin	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A
	[m]	[m]	[dB]	[dB(A)]	[dB]	[dB]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	1,847	1,856	0	28.40	2.00	30.40	109.4	0.00	76.37	-	-	0.00	0.00	-
2	2,302	2,310	0	25.62	2.00	27.62	109.4	0.00	78.27	-	-	0.00	0.00	-
3	3,726	3,732	0	19.31	2.00	21.31	109.4	0.00	82.44	-	-	0.00	0.00	-
4	4,477	4,482	0	16.85	2.00	18.85	109.4	0.00	84.03	-	-	0.00	0.00	-
5	5,055	5,059	0	15.21	2.00	17.21	109.4	0.00	85.08	-	-	0.00	0.00	-
6	5,466	5,469	0	14.15	2.00	16.15	109.4	0.00	85.76	-	-	0.00	0.00	-
Sum						32.97								

- Data undefined due to calculation with octave data

Noise sensitive area: F F.

Wind speed: 8.0 m/s
WTG

No.	Distance	Sound distance	Penalty	From WTGs	Uncertainty margin	WTG+Uncertainty margin	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A
	[m]	[m]	[dB]	[dB(A)]	[dB]	[dB]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	3,795	3,801	0	19.07	2.00	21.07	109.4	0.00	82.60	-	-	0.00	0.00	-
2	4,069	4,075	0	18.15	2.00	20.15	109.4	0.00	83.20	-	-	0.00	0.00	-
3	5,060	5,066	0	15.21	2.00	17.21	109.4	0.00	85.09	-	-	0.00	0.00	-
4	5,718	5,722	0	13.55	2.00	15.55	109.4	0.00	86.15	-	-	0.00	0.00	-
5	6,453	6,457	0	12.09	2.00	14.09	109.4	0.00	87.20	-	-	0.00	0.00	-
6	7,134	7,138	0	10.90	2.00	12.90	109.4	0.00	88.07	-	-	0.00	0.00	-
Sum						25.62								

- Data undefined due to calculation with octave data

Noise sensitive area: G G.

Wind speed: 8.0 m/s
WTG

No.	Distance	Sound distance	Penalty	From WTGs	Uncertainty margin	WTG+Uncertainty margin	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A
	[m]	[m]	[dB]	[dB(A)]	[dB]	[dB]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	5,186	5,190	0	14.87	2.00	16.87	109.4	0.00	85.30	-	-	0.00	0.00	-
2	4,995	4,999	0	15.38	2.00	17.38	109.4	0.00	84.98	-	-	0.00	0.00	-
3	4,991	4,996	0	15.38	2.00	17.38	109.4	0.00	84.97	-	-	0.00	0.00	-
4	5,266	5,270	0	14.66	2.00	16.66	109.4	0.00	85.44	-	-	0.00	0.00	-
5	5,810	5,814	0	13.32	2.00	15.32	109.4	0.00	86.29	-	-	0.00	0.00	-
6	6,438	6,442	0	12.12	2.00	14.12	109.4	0.00	87.18	-	-	0.00	0.00	-
Sum						24.22								

- Data undefined due to calculation with octave data

Noise sensitive area: H H.

Wind speed: 8.0 m/s
WTG

No.	Distance	Sound distance	Penalty	From WTGs	Uncertainty margin	WTG+Uncertainty margin	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A
	[m]	[m]	[dB]	[dB(A)]	[dB]	[dB]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	2,503	2,505	0	24.57	2.00	26.57	109.4	0.00	78.98	-	-	0.00	0.00	-
2	2,346	2,349	0	25.40	2.00	27.40	109.4	0.00	78.42	-	-	0.00	0.00	-
3	2,875	2,878	0	22.76	2.00	24.76	109.4	0.00	80.18	-	-	0.00	0.00	-
4	3,391	3,393	0	20.58	2.00	22.58	109.4	0.00	81.61	-	-	0.00	0.00	-
5	3,771	3,773	0	19.17	2.00	21.17	109.4	0.00	82.53	-	-	0.00	0.00	-
6	4,025	4,027	0	18.29	2.00	20.29	109.4	0.00	83.10	-	-	0.00	0.00	-
Sum						32.36								

- Data undefined due to calculation with octave data

Noise sensitive area: I I.

Wind speed: 8.0 m/s
WTG

No.	Distance	Sound distance	Penalty	From WTGs	Uncertainty margin	WTG+Uncertainty margin	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A
	[m]	[m]	[dB]	[dB(A)]	[dB]	[dB]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	5,624	5,627	0	14.37	2.00	16.37	109.4	0.00	86.01	-	-	0.00	0.00	-
2	4,901	4,904	0	16.28	2.00	18.28	109.4	0.00	84.81	-	-	0.00	0.00	-

To be continued on next page...

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Calculated:
8/29/2025 11:23 AM/4.1.287

DECIBEL - Detailed results

Calculation: Leppämäki_melumallinnus_29082025 Noise calculation model: ISO 9613-2:2024 Finland 8.0 m/s

...continued from previous page

WTG

No.	Distance	Sound distance	Penalty	From WTGs	Uncertainty margin	WTG+Uncertainty margin	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A
	[m]	[m]	[dB]	[dB(A)]	[dB]	[dB]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
3	3,412	3,417	0	21.20	2.00	23.20	109.4	0.00	81.67	-	-	0.00	0.00	-
4	2,743	2,749	0	24.08	2.00	26.08	109.4	0.00	79.78	-	-	0.00	0.00	-
5	2,067	2,075	0	27.68	2.00	29.68	109.4	0.00	77.34	-	-	0.00	0.00	-
6	1,420	1,432	0	32.28	2.00	34.28	109.4	0.00	74.12	-	-	0.00	0.00	-
Sum						36.37								

- Data undefined due to calculation with octave data

Noise sensitive area: J J.

Wind speed: 8.0 m/s

WTG

No.	Distance	Sound distance	Penalty	From WTGs	Uncertainty margin	WTG+Uncertainty margin	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A
	[m]	[m]	[dB]	[dB(A)]	[dB]	[dB]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1	1,788	1,798	0	28.80	2.00	30.80	109.4	0.00	76.10	-	-	0.00	0.00	-
2	2,433	2,440	0	24.91	2.00	26.91	109.4	0.00	78.75	-	-	0.00	0.00	-
3	4,041	4,047	0	18.23	2.00	20.23	109.4	0.00	83.14	-	-	0.00	0.00	-
4	4,842	4,847	0	15.79	2.00	17.79	109.4	0.00	84.71	-	-	0.00	0.00	-
5	5,475	5,479	0	14.13	2.00	16.13	109.4	0.00	85.77	-	-	0.00	0.00	-
6	5,939	5,943	0	13.06	2.00	15.06	109.4	0.00	86.48	-	-	0.00	0.00	-
Sum						32.86								

- Data undefined due to calculation with octave data

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Calculated:
8/29/2025 11:23 AM/4.1.287

DECIBEL - Assumptions for noise calculation

Calculation: Leppämäki_melumallinnus_29082025

Noise calculation model:
ISO 9613-2:2024 Finland
Wind speed (at 10 m height):
8.0 m/s
Ground attenuation:
General, terrain specific
Ground factor for porous ground: 0.4
Area object with hard ground: Vesistoaineisto
Area type with hard ground: Vesistoaineisto
Ground factor for hard ground: 0.0
Meteorological coefficient, C0:
Selected option: Fixed value: 0.0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Pure tones:
Pure tones penalty is added to total noise impact at receptors
Noise sensitive area
Height above ground level, when no value in NSA object:
4.0 m; Don't allow override of model height with height from NSA object
Uncertainty margin:
Uncertainty added to source noise level of the WTGs in the calculation
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0.0 dB(A)
Octave data required
Input parameters for calculation of air absorption:

Temperature	15.0 °C
Relative humidity	70.0 %
Pressure	101.325 kPa

Frequency dependent air absorption

63	125	250	500	1,000	2,000	4,000	8,000
[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]
0.1	0.4	1.1	2.4	4.1	8.7	26.4	93.7

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89

WTG: NORDEX N163/6.X 7000 163.0 !O!
Noise: Mode 0 - without serrated trailing edge

Source	Source/Date	Creator	Edited
Nordex	10/13/2023	USER	8/26/2025 2:05 PM

Nordex: Third octave sound power levels Nordex N163/6.x
F008_277_A17_EN, Rev.09
p.13

						Octave data							
Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Uncertainty [dB(A)]	Pure tones	63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	190.0	8.0	109.4	2.0	No	88.6	97.8	100.3	101.6	103.5	104.2	97.4	83.0

Noise sensitive area: A A.
No noise demand

No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: B B.
No noise demand

No distance demand
Pure tone penalty: 0 dB

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Calculated:
8/29/2025 11:23 AM/4.1.287

DECIBEL - Assumptions for noise calculation

Calculation: Leppämäki_melumallinnus_29082025

Noise sensitive area: C C.
No noise demand

No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: D D.
No noise demand

No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: F F.
No noise demand

No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: G G.
No noise demand

No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: H H.
No noise demand

No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: I I.
No noise demand

No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: J J.
No noise demand

No distance demand
Pure tone penalty: 0 dB

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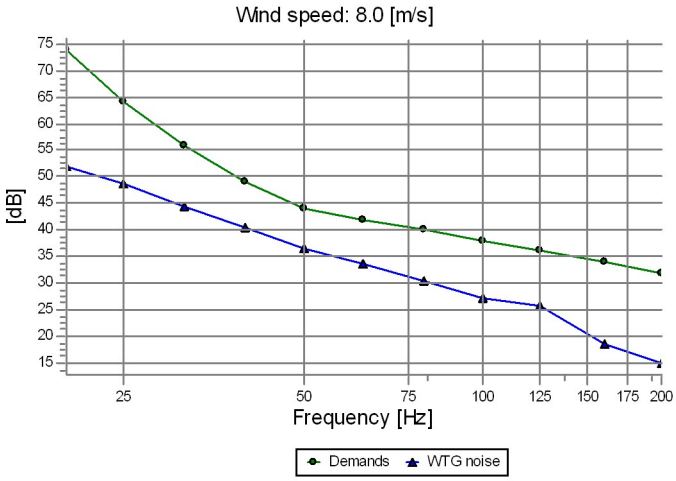
Calculated:
9/19/2025 1:28 PM/4.1.292

DECIBEL - Detailed results, graphic

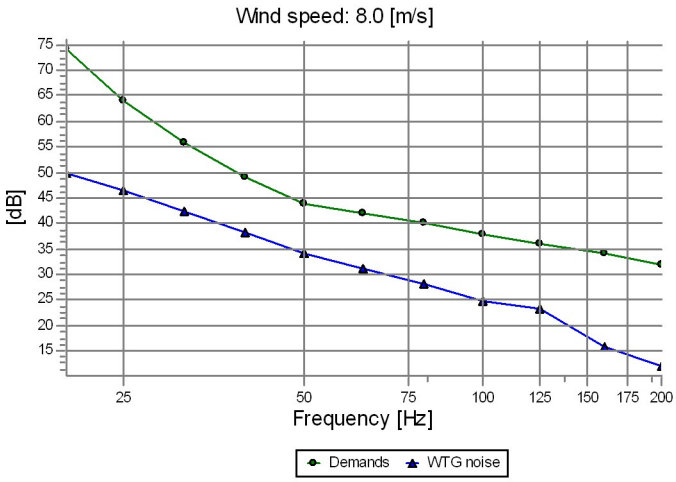
Calculation: Leppämäki_pienitaajuinen_melu_sisällä_19092025 Noise calculation model: Finland Low frequency 8.0 m/s

A A.



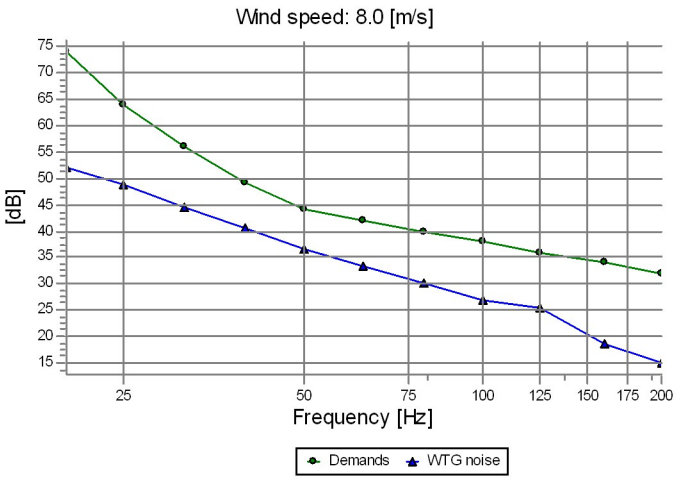
Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20.0	74.0	52.0	Yes
25.0	64.0	48.7	Yes
31.5	56.0	44.6	Yes
40.0	49.0	40.4	Yes
50.0	44.0	36.5	Yes
63.0	42.0	33.5	Yes
80.0	40.0	30.3	Yes
100.0	38.0	27.1	Yes
125.0	36.0	25.6	Yes
160.0	34.0	18.5	Yes
200.0	32.0	14.8	Yes

B B.



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20.0	74.0	49.8	Yes
25.0	64.0	46.4	Yes
31.5	56.0	42.3	Yes
40.0	49.0	38.1	Yes
50.0	44.0	34.2	Yes
63.0	42.0	31.2	Yes
80.0	40.0	28.0	Yes
100.0	38.0	24.7	Yes
125.0	36.0	23.2	Yes
160.0	34.0	16.0	Yes
200.0	32.0	12.2	Yes

C C.



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20.0	74.0	52.0	Yes
25.0	64.0	48.6	Yes
31.5	56.0	44.5	Yes
40.0	49.0	40.4	Yes
50.0	44.0	36.5	Yes
63.0	42.0	33.5	Yes
80.0	40.0	30.3	Yes
100.0	38.0	27.1	Yes
125.0	36.0	25.7	Yes
160.0	34.0	18.6	Yes
200.0	32.0	15.0	Yes

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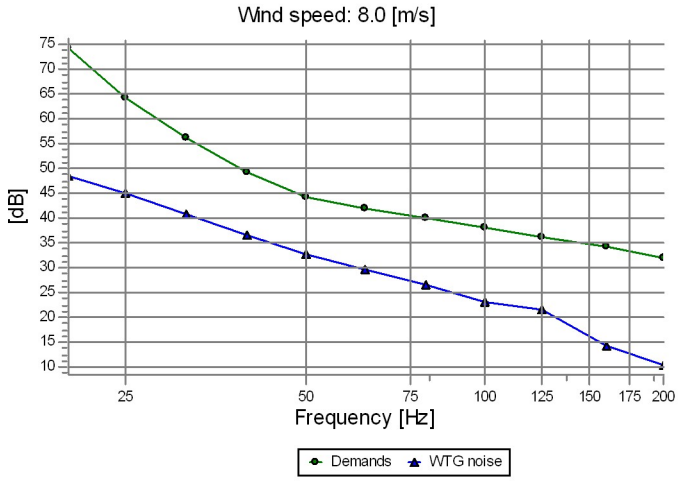
DECIBEL - Detailed results, graphic

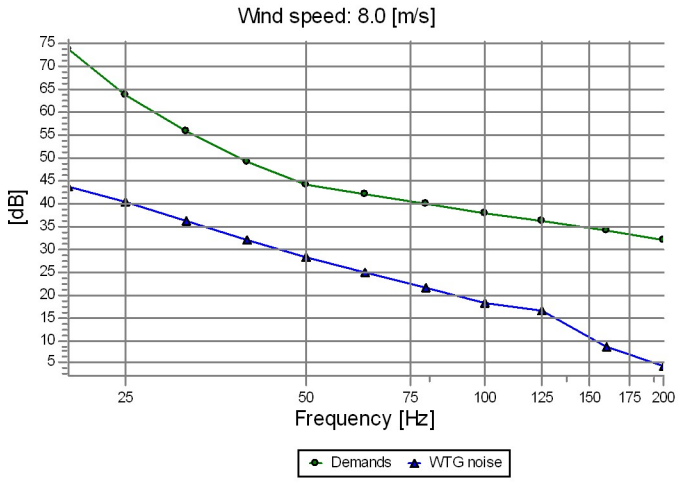
Calculation: Leppämäki_pienitaajuinen_melu_sisällä_19092025 Noise calculation model: Finland Low frequency 8.0 m/s

D D.



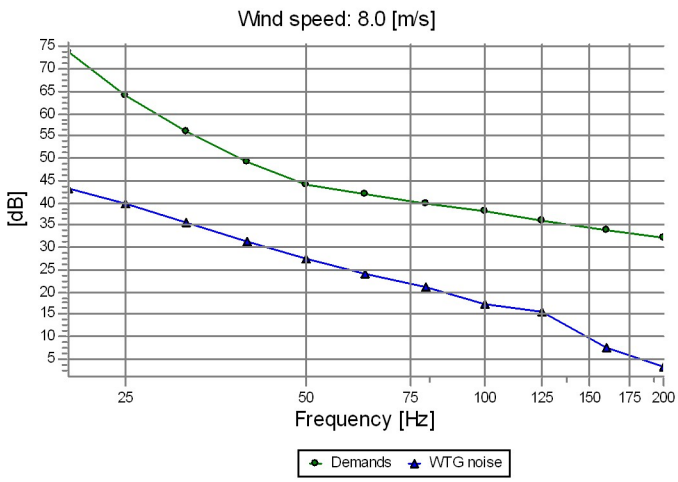
Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20.0	74.0	48.3	Yes
25.0	64.0	44.9	Yes
31.5	56.0	40.8	Yes
40.0	49.0	36.6	Yes
50.0	44.0	32.7	Yes
63.0	42.0	29.7	Yes
80.0	40.0	26.4	Yes
100.0	38.0	23.1	Yes
125.0	36.0	21.6	Yes
160.0	34.0	14.3	Yes
200.0	32.0	10.4	Yes

F F.



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20.0	74.0	43.8	Yes
25.0	64.0	40.5	Yes
31.5	56.0	36.3	Yes
40.0	49.0	32.1	Yes
50.0	44.0	28.1	Yes
63.0	42.0	25.0	Yes
80.0	40.0	21.7	Yes
100.0	38.0	18.1	Yes
125.0	36.0	16.3	Yes
160.0	34.0	8.6	Yes
200.0	32.0	4.3	Yes

G G.



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20.0	74.0	43.2	Yes
25.0	64.0	39.7	Yes
31.5	56.0	35.6	Yes
40.0	49.0	31.4	Yes
50.0	44.0	27.4	Yes
63.0	42.0	24.3	Yes
80.0	40.0	20.9	Yes
100.0	38.0	17.3	Yes
125.0	36.0	15.4	Yes
160.0	34.0	7.6	Yes
200.0	32.0	3.1	Yes

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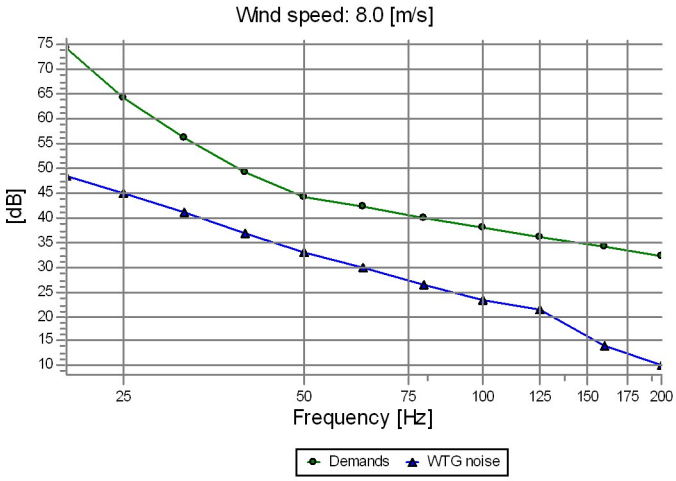
DECIBEL - Detailed results, graphic

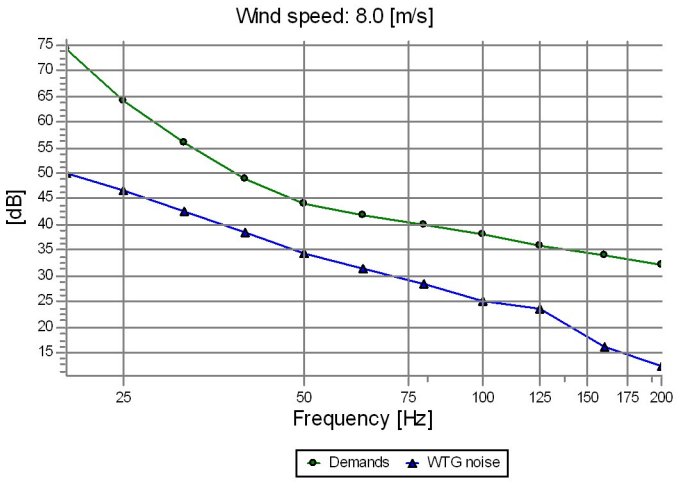
Calculation: Leppämäki_pienitaajuinen_melu_sisällä_19092025 Noise calculation model: Finland Low frequency 8.0 m/s

H H.



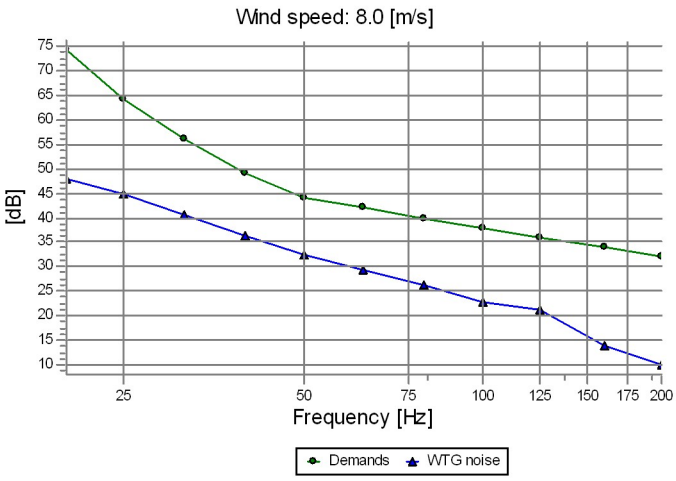
Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20.0	74.0	48.3	Yes
25.0	64.0	45.0	Yes
31.5	56.0	40.8	Yes
40.0	49.0	36.7	Yes
50.0	44.0	32.7	Yes
63.0	42.0	29.7	Yes
80.0	40.0	26.5	Yes
100.0	38.0	23.1	Yes
125.0	36.0	21.5	Yes
160.0	34.0	14.2	Yes
200.0	32.0	10.3	Yes

I I.



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20.0	74.0	50.0	Yes
25.0	64.0	46.7	Yes
31.5	56.0	42.6	Yes
40.0	49.0	38.4	Yes
50.0	44.0	34.5	Yes
63.0	42.0	31.5	Yes
80.0	40.0	28.3	Yes
100.0	38.0	25.0	Yes
125.0	36.0	23.5	Yes
160.0	34.0	16.3	Yes
200.0	32.0	12.6	Yes

J J.



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20.0	74.0	48.1	Yes
25.0	64.0	44.7	Yes
31.5	56.0	40.6	Yes
40.0	49.0	36.4	Yes
50.0	44.0	32.5	Yes
63.0	42.0	29.5	Yes
80.0	40.0	26.2	Yes
100.0	38.0	22.9	Yes
125.0	36.0	21.4	Yes
160.0	34.0	14.1	Yes
200.0	32.0	10.2	Yes

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Calculated:
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DECIBEL - Assumptions for noise calculation

Calculation: Leppämäki_pienitaajuinen_melu_sisällä_19092025

Noise calculation model:
Finland Low frequency
Wind speed (at 10 m height):
8.0 m/s
Spectral distribution:
From 20.0 Hz to 200.0 Hz
Meteorological coefficient, C0:
Selected option: Fixed value: 0.0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Pure tones:
Pure tone penalty is subtracted from demand
Model: 5.0 dB(A)
Height above ground level, when no value in NSA object:
4.0 m; Don't allow override of model height with height from NSA object
Uncertainty margin:
0.0 dB; Uncertainty margin in NSA has priority
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0.0 dB(A)
Low frequency calculation
dLsigma

20.0 Hz	25.0 Hz	31.5 Hz	40.0 Hz	50.0 Hz	63.0 Hz	80.0 Hz	100.0 Hz	125.0 Hz	160.0 Hz	200.0 Hz
[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
7.6	8.3	9.2	10.3	11.5	13.0	14.8	16.8	18.8	21.1	22.8

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89

WTG: NORDEX N163/6.X 7000 163.0 !O!
Noise: Mode 0 - without serrated trailingedges_2dB_added

Source	Source/Date	Creator	Edited
Nordex	10/13/2022	USER	8/27/2025 1:54 PM

Nordex: Third octave sound power levels Nordex N163/6.x
F008_277_A17_EN, Rev.09
p.13
2 dB uncertainty added

Status	Hub height	Wind speed	LwA,ref	20.0 Hz	25.0 Hz	31.5 Hz	40.0 Hz	50.0 Hz	63.0 Hz	80.0 Hz	100.0 Hz	125.0 Hz	160.0 Hz	200.0 Hz
	[m]	[m/s]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From Windcat	190.0	8.0	102.1	72.5	75.9	78.2	80.2	82.2	85.2	88.2	91.2	96.2	96.2	97.2

Noise sensitive area: A A.

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: 0.0 dB
No temporal binning
Noise demand:

20.0 Hz	25.0 Hz	31.5 Hz	40.0 Hz	50.0 Hz	63.0 Hz	80.0 Hz	100.0 Hz	125.0 Hz	160.0 Hz	200.0 Hz
74.0 dB	64.0 dB	56.0 dB	49.0 dB	44.0 dB	42.0 dB	40.0 dB	38.0 dB	36.0 dB	34.0 dB	32.0 dB

No distance demand

Noise sensitive area: B B.

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: 0.0 dB
No temporal binning
Noise demand:

20.0 Hz	25.0 Hz	31.5 Hz	40.0 Hz	50.0 Hz	63.0 Hz	80.0 Hz	100.0 Hz	125.0 Hz	160.0 Hz	200.0 Hz
74.0 dB	64.0 dB	56.0 dB	49.0 dB	44.0 dB	42.0 dB	40.0 dB	38.0 dB	36.0 dB	34.0 dB	32.0 dB

No distance demand

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Calculated:
9/19/2025 1:28 PM/4.1.292

DECIBEL - Assumptions for noise calculation

Calculation: Leppämäki_pienitaajuinen_melu_sisällä_19092025

Noise sensitive area: C C.

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: 0.0 dB
No temporal binning
Noise demand:

20.0 Hz	25.0 Hz	31.5 Hz	40.0 Hz	50.0 Hz	63.0 Hz	80.0 Hz	100.0 Hz	125.0 Hz	160.0 Hz	200.0 Hz
74.0 dB	64.0 dB	56.0 dB	49.0 dB	44.0 dB	42.0 dB	40.0 dB	38.0 dB	36.0 dB	34.0 dB	32.0 dB

No distance demand

Noise sensitive area: D D.

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: 0.0 dB
No temporal binning
Noise demand:

20.0 Hz	25.0 Hz	31.5 Hz	40.0 Hz	50.0 Hz	63.0 Hz	80.0 Hz	100.0 Hz	125.0 Hz	160.0 Hz	200.0 Hz
74.0 dB	64.0 dB	56.0 dB	49.0 dB	44.0 dB	42.0 dB	40.0 dB	38.0 dB	36.0 dB	34.0 dB	32.0 dB

No distance demand

Noise sensitive area: F F.

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: 0.0 dB
No temporal binning
Noise demand:

20.0 Hz	25.0 Hz	31.5 Hz	40.0 Hz	50.0 Hz	63.0 Hz	80.0 Hz	100.0 Hz	125.0 Hz	160.0 Hz	200.0 Hz
74.0 dB	64.0 dB	56.0 dB	49.0 dB	44.0 dB	42.0 dB	40.0 dB	38.0 dB	36.0 dB	34.0 dB	32.0 dB

No distance demand

Noise sensitive area: G G.

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: 0.0 dB
No temporal binning
Noise demand:

20.0 Hz	25.0 Hz	31.5 Hz	40.0 Hz	50.0 Hz	63.0 Hz	80.0 Hz	100.0 Hz	125.0 Hz	160.0 Hz	200.0 Hz
74.0 dB	64.0 dB	56.0 dB	49.0 dB	44.0 dB	42.0 dB	40.0 dB	38.0 dB	36.0 dB	34.0 dB	32.0 dB

No distance demand

Noise sensitive area: H H.

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: 0.0 dB
No temporal binning
Noise demand:

20.0 Hz	25.0 Hz	31.5 Hz	40.0 Hz	50.0 Hz	63.0 Hz	80.0 Hz	100.0 Hz	125.0 Hz	160.0 Hz	200.0 Hz
74.0 dB	64.0 dB	56.0 dB	49.0 dB	44.0 dB	42.0 dB	40.0 dB	38.0 dB	36.0 dB	34.0 dB	32.0 dB

No distance demand

Noise sensitive area: I I.

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: 0.0 dB
No temporal binning
Noise demand:

20.0 Hz	25.0 Hz	31.5 Hz	40.0 Hz	50.0 Hz	63.0 Hz	80.0 Hz	100.0 Hz	125.0 Hz	160.0 Hz	200.0 Hz
74.0 dB	64.0 dB	56.0 dB	49.0 dB	44.0 dB	42.0 dB	40.0 dB	38.0 dB	36.0 dB	34.0 dB	32.0 dB

No distance demand

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Calculated:
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DECIBEL - Assumptions for noise calculation

Calculation: Leppämäki_pienitaajuinen_melu_sisällä_19092025

Noise sensitive area: J J.

Predefined calculation standard: Residential health guide 2003, indoor - night

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: 0.0 dB

No temporal binning

Noise demand:

20.0 Hz	25.0 Hz	31.5 Hz	40.0 Hz	50.0 Hz	63.0 Hz	80.0 Hz	100.0 Hz	125.0 Hz	160.0 Hz	200.0 Hz
74.0 dB	64.0 dB	56.0 dB	49.0 dB	44.0 dB	42.0 dB	40.0 dB	38.0 dB	36.0 dB	34.0 dB	32.0 dB

No distance demand

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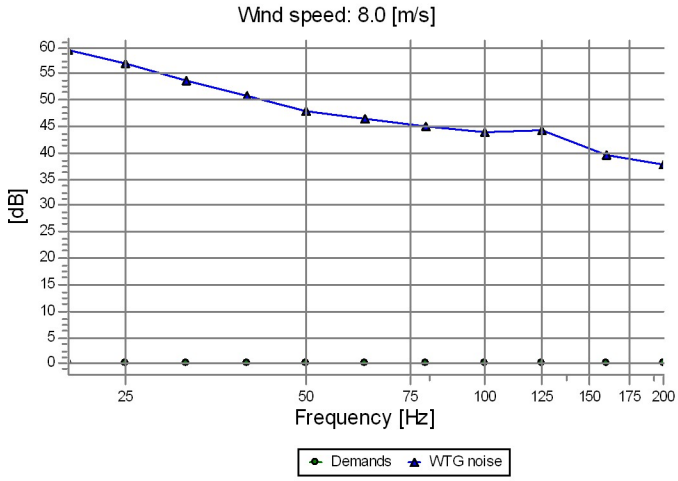
Calculated:
9/19/2025 2:00 PM/4.1.292

DECIBEL - Detailed results, graphic

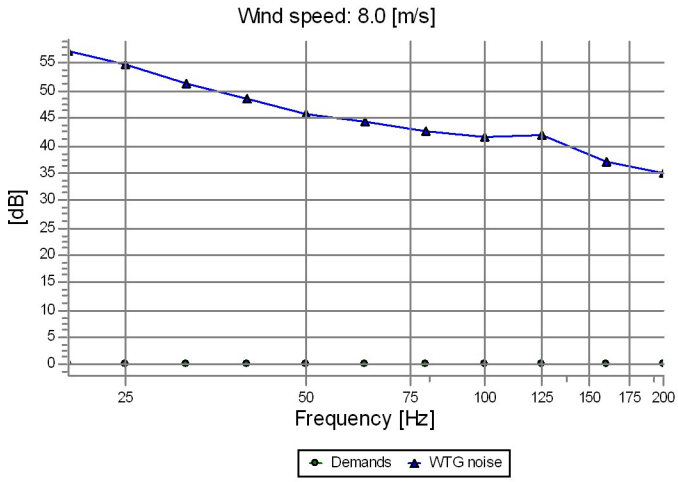
Calculation: Leppämäki_pienitaajuinen_melu_ulkona_19092025 Noise calculation model: Finland Low frequency 8.0 m/s

A A.



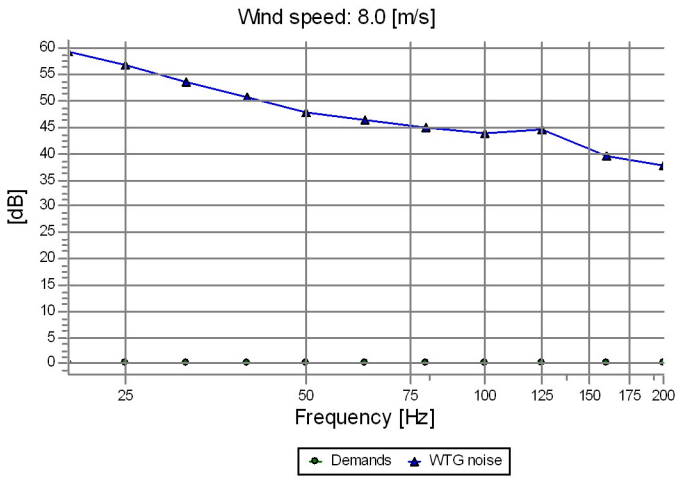
Frequency [Hz]	Sound level WTG noise [dB]
20.0	59.6
25.0	57.0
31.5	53.8
40.0	50.7
50.0	48.0
63.0	46.5
80.0	45.1
100.0	43.9
125.0	44.4
160.0	39.6
200.0	37.6

B B.



Frequency [Hz]	Sound level WTG noise [dB]
20.0	57.4
25.0	54.7
31.5	51.5
40.0	48.4
50.0	45.7
63.0	44.2
80.0	42.8
100.0	41.5
125.0	42.0
160.0	37.1
200.0	35.0

C C.



Frequency [Hz]	Sound level WTG noise [dB]
20.0	59.6
25.0	56.9
31.5	53.7
40.0	50.7
50.0	48.0
63.0	46.5
80.0	45.1
100.0	43.9
125.0	44.5
160.0	39.7
200.0	37.8

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Calculated:
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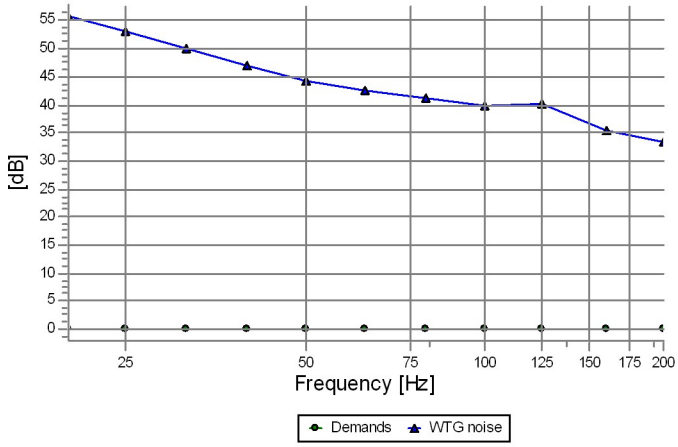
DECIBEL - Detailed results, graphic

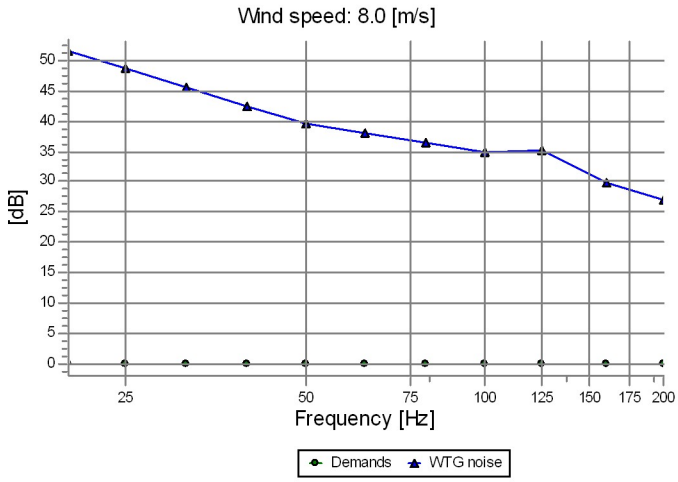
Calculation: Leppämäki_pienitaajuinen_melu_ulkona_19092025 Noise calculation model: Finland Low frequency 8.0 m/s

D D.



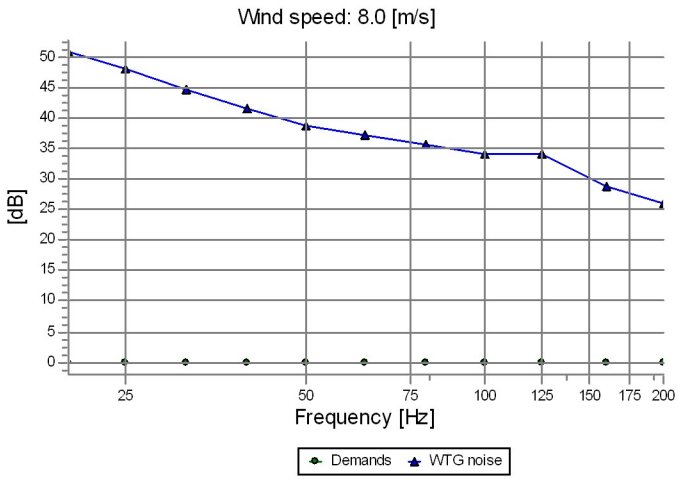
Frequency [Hz]	Sound level WTG noise [dB]
20.0	55.9
25.0	53.2
31.5	50.0
40.0	46.9
50.0	44.2
63.0	42.7
80.0	41.2
100.0	39.9
125.0	40.4
160.0	35.4
200.0	33.2

F F.



Frequency [Hz]	Sound level WTG noise [dB]
20.0	51.4
25.0	48.8
31.5	45.5
40.0	42.4
50.0	39.6
63.0	38.0
80.0	36.5
100.0	34.9
125.0	35.1
160.0	29.7
200.0	27.1

G G.



Frequency [Hz]	Sound level WTG noise [dB]
20.0	50.8
25.0	48.0
31.5	44.8
40.0	41.7
50.0	38.9
63.0	37.3
80.0	35.7
100.0	34.1
125.0	34.2
160.0	28.7
200.0	25.9

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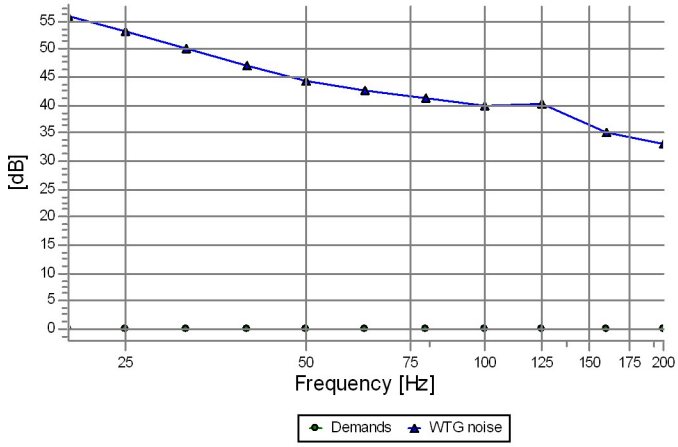
Calculated:
9/19/2025 2:00 PM/4.1.292

DECIBEL - Detailed results, graphic

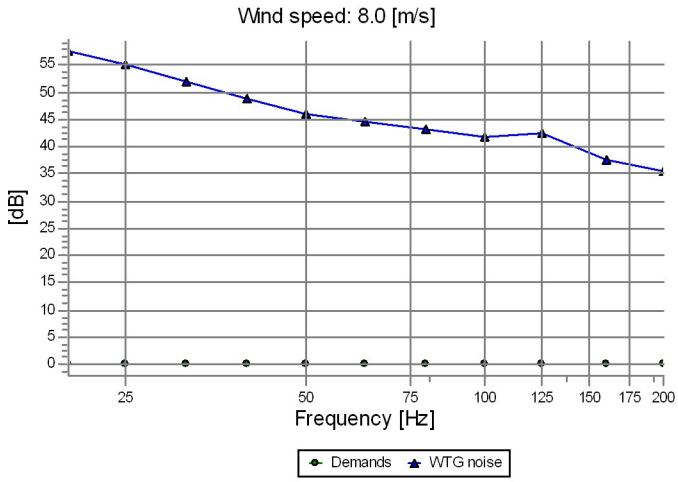
Calculation: Leppämäki_pienitaajuinen_melu_ulkona_19092025 Noise calculation model: Finland Low frequency 8.0 m/s

H H.



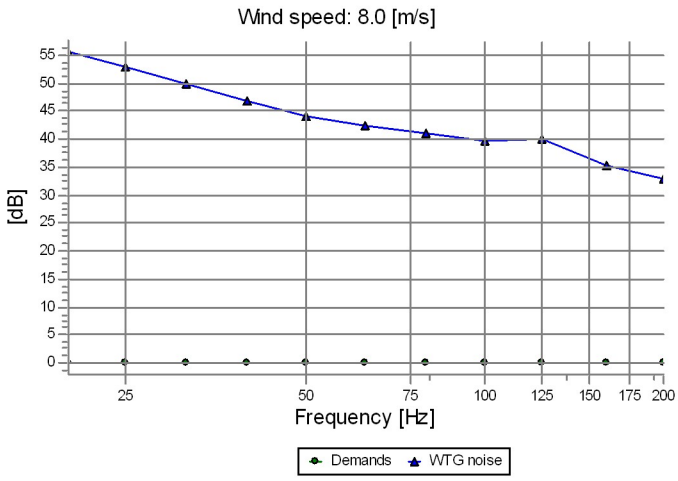
Frequency [Hz]	Sound level WTG noise [dB]
20.0	55.9
25.0	53.3
31.5	50.0
40.0	47.0
50.0	44.2
63.0	42.7
80.0	41.3
100.0	39.9
125.0	40.3
160.0	35.3
200.0	33.1

I I.



Frequency [Hz]	Sound level WTG noise [dB]
20.0	57.6
25.0	55.0
31.5	51.8
40.0	48.7
50.0	46.0
63.0	44.5
80.0	43.1
100.0	41.8
125.0	42.3
160.0	37.4
200.0	35.4

J J.



Frequency [Hz]	Sound level WTG noise [dB]
20.0	55.7
25.0	53.0
31.5	49.8
40.0	46.7
50.0	44.0
63.0	42.5
80.0	41.0
100.0	39.7
125.0	40.2
160.0	35.2
200.0	33.0