

320120954P

WindPRO version 2.8.579 Dec 2012

Project:

Lower Gazegill

Description:

Desktop Noise Assessment for 1no. 20kW CF20 Wind Turbine at Lower Gazegill Farm.
All Calculations have been carried out in line with ETSU-R-97 Guidelines

Printed/Page

28/03/2013 12:37 / 1

Licensed user:

Entrust

Daresbury Innovation Centre Keckwick Lane

GB-DARESBURY WA4 4FS

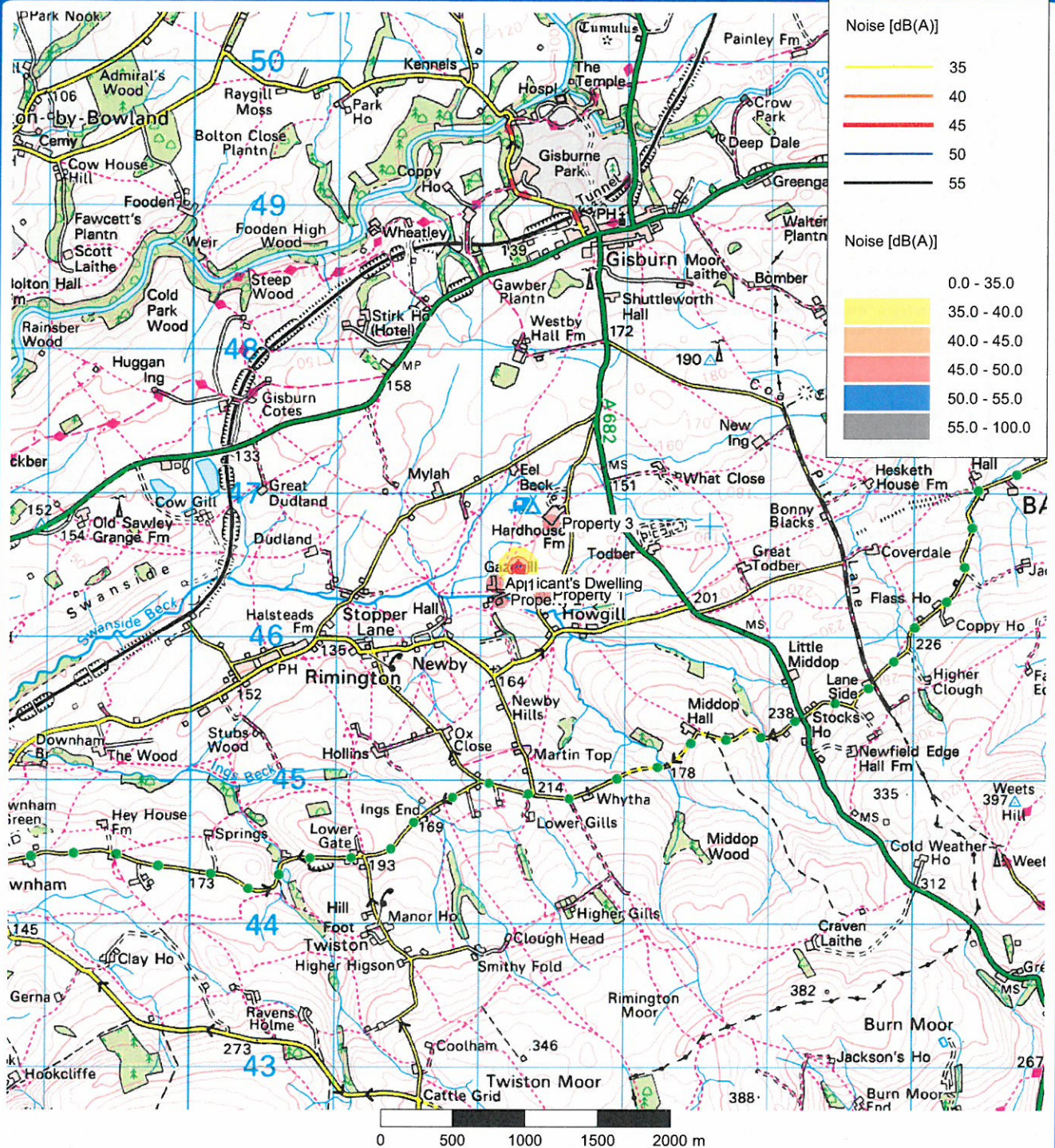
+44 1925 607 235

Conor McAllister / conor@en-trust.co.uk

Calculated:

28/03/2013 12:36/2.8.579

DECIBEL - Map 8.0 m/s



Map: lowergill , Print scale 1:40,000, Map center BN (AIRY) (Normal) East: 382,266 North: 446,480

Noise sensitive area

Noise calculation model: ISO 9613-2 General. Wind speed: 8.0 m/s

Height above sea level from active line object

Project:
Lower Gazegill

Description:
Desktop Noise Assessment for 1no. 20kW CF20 Wind Turbine at Lower Gazegill Farm.
All Calculations have been carried out in line with ETSU-R-97 Guidelines

Printed/Page
28/03/2013 12:36 / 1

Licensed user:
Entrust
Daresbury Innovation Centre Keckwick Lane
GB-DARESBURY WA4 4FS
+44 1925 607 235
Conor McAllister / conor@en-trust.co.uk
Calculated:
28/03/2013 12:36/2.8.579

DECIBEL - Main Result

Noise calculation model:

ISO 9613-2 General

Wind speed:

4.0 m/s - 10.0 m/s, step 1.0 m/s

Ground attenuation:

General, Ground factor: 0.5

Meteorological coefficient, C0:

0.0 dB

Type of demand in calculation:

3: WTG noise is compared to ambient noise plus margin (UK, AT etc.)

Noise values in calculation:

All noise values are 90% exceedance values (L90)

Pure tones:

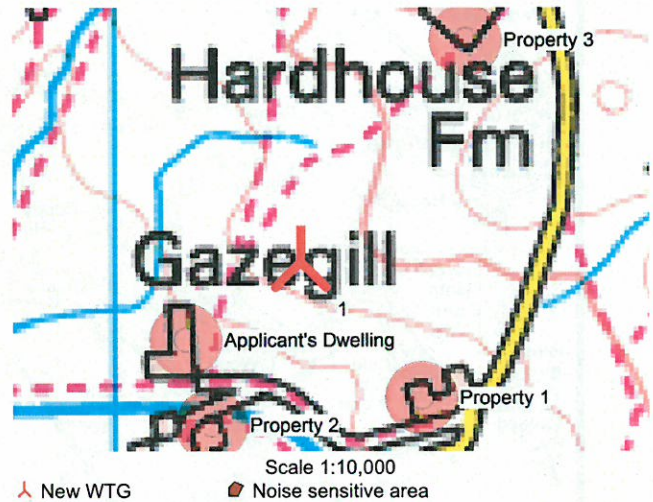
Pure and Impulse tone penalty are added to WTG source noise

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

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0.0 dB(A)



WTGs

BN (AIRY) (Normal)				WTG type				Noise data							
East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Creator	Name	First wind speed	LwaRef	Last wind speed	LwaRef
							[kW]	[m]	[m]			[m/s]	[dB(A)]	[m/s]	[dB(A)]
1	382,266	446,480	144.7 C&F CF20 20 13.1 !OI hub: 20... No	C&F		CF20-20	20	13.1	20.5	USER	Acoustics performance test 2012	4.0	78.9	10.0	95.1
g) Data calculated from data for other wind speed (uncertain)															

h) Generic octave distribution used

g) Data calculated from data for other wind speed (uncertain)

Calculation Results

Sound Level

Noise sensitive area		BN (AIRY) (Normal)			Demands		Sound Level		Demands fulfilled ?	
No.	Name	East	North	Z	Imission height	Max Noise demand	Max From WTGs	Max exceedence	Noise	
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]		
Applicant's Dwelling	Noise sensitive point: British - British (4)	382,106	446,372	128.2	4.0	45.0	36.8	0.0	Yes	
Property 1	Noise sensitive point: British - British (1)	382,433	446,291	134.6	4.0	35.0	34.3	0.0	Yes	
Property 2	Noise sensitive point: British - British (2)	382,142	446,253	128.8	4.0	35.0	34.1	0.0	Yes	
Property 3	Noise sensitive point: British - British (3)	382,494	446,787	155.3	4.0	35.0	30.3	0.0	Yes	

Distances (m)

	WTG
NSA	1
Applicant's Dwelling	193
Property 1	252
Property 2	258
Property 3	383

Project:

Lower Gazegill

Description:

Desktop Noise Assessment for 1no. 20kW CF20 Wind Turbine at Lower Gazegill Farm.
All Calculations have been carried out in line with ETSU-R-97 Guidelines

Printed/Page

28/03/2013 12:37 / 1

Licensed user:

Entrust

Daresbury Innovation Centre Keckwick Lane
GB-DARESBURY WA4 4FS
+44 1925 607 235

Conor McAllister / conor@en-trust.co.uk

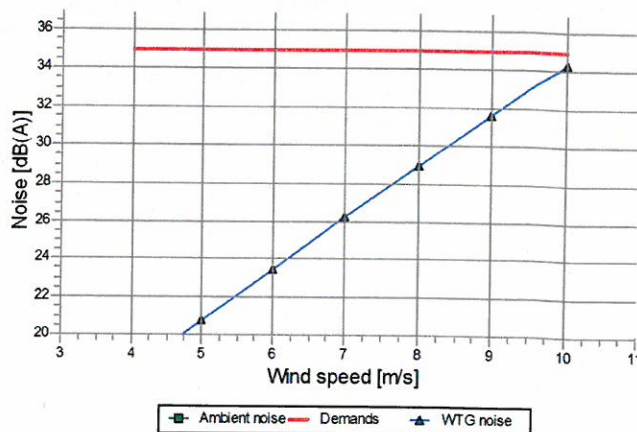
Calculated:

28/03/2013 12:36/2.8.579

DECIBEL - Detailed results

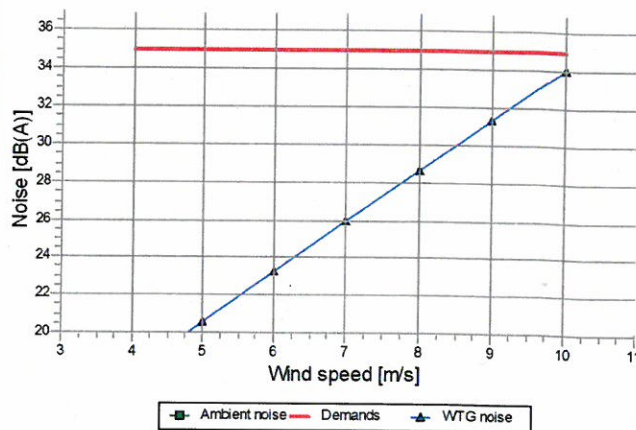
Noise calculation model: ISO 9613-2 General

Noise sensitive point: British - British (1) (Property 1)



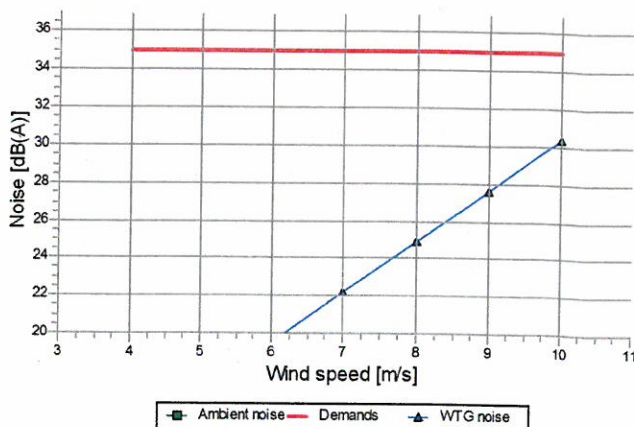
Wind speed	Ambient noise	Demands		Sound Level	
		Margin	Demands	WTG noise	Demands fulfilled
[m/s]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	?
4.0	0.1	5.0	35.0	18.1	Yes
5.0	0.1	5.0	35.0	20.8	Yes
6.0	0.1	5.0	35.0	23.5	Yes
7.0	0.1	5.0	35.0	26.2	Yes
8.0	0.1	5.0	35.0	28.9	Yes
9.0	0.1	5.0	35.0	31.6	Yes
10.0	0.1	5.0	35.0	34.3	Yes

Noise sensitive point: British - British (2) (Property 2)



Wind speed	Ambient noise	Demands		Sound Level	
		Margin	Demands	WTG noise	Demands fulfilled
[m/s]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	?
4.0	0.1	5.0	35.0	17.9	Yes
5.0	0.1	5.0	35.0	20.6	Yes
6.0	0.1	5.0	35.0	23.3	Yes
7.0	0.1	5.0	35.0	26.0	Yes
8.0	0.1	5.0	35.0	28.7	Yes
9.0	0.1	5.0	35.0	31.4	Yes
10.0	0.1	5.0	35.0	34.1	Yes

Noise sensitive point: British - British (3) (Property 3)



Wind speed	Ambient noise	Demands		Sound Level	
		Margin	Demands	WTG noise	Demands fulfilled
[m/s]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	?
4.0	0.1	5.0	35.0	14.1	Yes
5.0	0.1	5.0	35.0	16.8	Yes
6.0	0.1	5.0	35.0	19.5	Yes
7.0	0.1	5.0	35.0	22.2	Yes
8.0	0.1	5.0	35.0	24.9	Yes
9.0	0.1	5.0	35.0	27.6	Yes
10.0	0.1	5.0	35.0	30.3	Yes

Project:

Lower Gazegill

Description:

Desktop Noise Assessment for 1no. 20kW CF20 Wind Turbine at Lower
Gazegill Farm.
All Calculations have been carried out in line with ETSU-R-97 Guidelines

Printed/Page

28/03/2013 12:37 / 2

Licensed user:

Entrust

Daresbury Innovation Centre Keckwick Lane
GB-DARESBURY WA4 4FS
+44 1925 607 235

Conor McAllister / conor@en-trust.co.uk

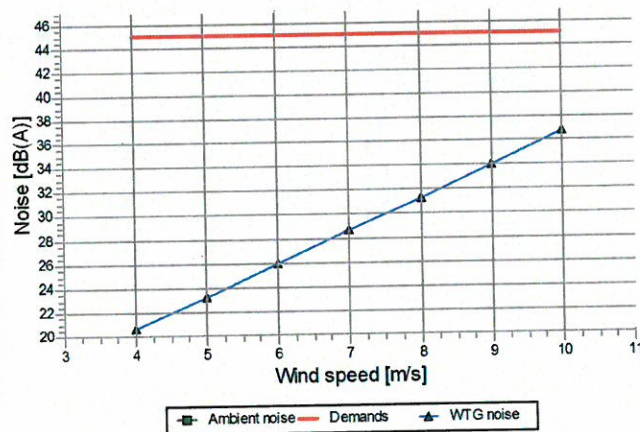
Calculated:

28/03/2013 12:36/2.8.579

DECIBEL - Detailed results

Noise calculation model: ISO 9613-2 General

Noise sensitive point: British - British (4) (Applicant's Dwelling)



Wind speed [m/s]	Ambient noise [dB(A)]	Demands		Sound Level	
		Margin [dB(A)]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	0.1	5.0	45.0	20.5	Yes
5.0	0.1	5.0	45.0	23.2	Yes
6.0	0.1	5.0	45.0	26.0	Yes
7.0	0.1	5.0	45.0	28.7	Yes
8.0	0.1	5.0	45.0	31.3	Yes
9.0	0.1	5.0	45.0	34.0	Yes
10.0	0.1	5.0	45.0	36.8	Yes

Project:

Lower Gazegill

Description:

Desktop Noise Assessment for 1no. 20kW CF20 Wind Turbine at Lower Gazegill Farm.
All Calculations have been carried out in line with ETSU-R-97 Guidelines

Printed/Page

28/03/2013 12:37 / 1

Licensed user:

Entrust

Daresbury Innovation Centre Keckwick Lane
GB-DARESBURY WA4 4FS

+44 1925 607 235

Conor McAllister / conor@en-trust.co.uk

Calculated:

28/03/2013 12:36/2.8.579

DECIBEL - Assumptions for noise calculation**Noise calculation model:**

ISO 9613-2 General

Wind speed:

4.0 m/s - 10.0 m/s, step 1.0 m/s

Ground attenuation:

General, Ground factor: 0.5

Meteorological coefficient, C0:

0.0 dB

Type of demand in calculation:

3: WTG noise is compared to ambient noise plus margin (UK, AT etc.)

Noise values in calculation:

All noise values are 90% exceedance values (L90)

Pure tones:

Pure and Impulse tone penalty are added to WTG source noise

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

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0.0 dB(A)

Octave data required

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	1.0	1.9	3.7	9.7	32.8	117.0

WTG: C&F CF20 20 13.1 IO!**Noise: Acoustics performance test 2012**

Source

Source/Date Creator Edited

Intertek Report 01/02/2012 USER 09/03/2012 11:04

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data							
					63	125	250	500	1000	2000	4000	8000
					[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From slope	20.5	4.0	78.9	No	Generic data 60.5	67.5	70.9	73.5	73.3	70.4	65.6	56.1
Interpolated	20.5	5.0	81.6	No	Generic data 63.2	70.2	73.6	76.2	76.0	73.1	68.3	58.8
Interpolated	20.5	6.0	84.3	No	Generic data 65.9	72.9	76.3	78.9	78.7	75.8	71.0	61.5
Interpolated	20.5	7.0	87.0	No	Generic data 68.6	75.6	79.0	81.6	81.4	78.5	73.7	64.2
From Windcat		8.0	89.7	No	Generic data 71.3	78.3	81.7	84.3	84.1	81.2	76.4	66.9
ExtraPolated	20.5	9.0	92.4	No	Generic data 74.0	81.0	84.4	87.0	86.8	83.9	79.1	69.6
ExtraPolated	20.5	10.0	95.1	No	Generic data 76.7	83.7	87.1	89.7	89.5	86.6	81.8	72.3

NSA: Noise sensitive point: British - British (1)-Property 1**Predefined calculation standard: British****Immission height(a.g.l.): Use standard value from calculation model****Ambient noise:**

4.0 [m/s] 5.0 [m/s] 6.0 [m/s] 7.0 [m/s] 8.0 [m/s] 9.0 [m/s] 10.0 [m/s] 11.0 [m/s] 12.0 [m/s]
0.1 dB(A) 0.1 dB(A) 0.1 dB(A) 0.1 dB(A) 0.1 dB(A) 0.1 dB(A) 0.1 dB(A) 0.1 dB(A) 0.1 dB(A)

Margin or Allowed additional exposure: 5.0 dB(A)**Sound level always accepted: 35.0 dB(A)****Distance demand:****NSA: Noise sensitive point: British - British (2)-Property 2****Predefined calculation standard: British****Immission height(a.g.l.): Use standard value from calculation model****Ambient noise:**

4.0 [m/s] 5.0 [m/s] 6.0 [m/s] 7.0 [m/s] 8.0 [m/s] 9.0 [m/s] 10.0 [m/s] 11.0 [m/s] 12.0 [m/s]
0.1 dB(A) 0.1 dB(A) 0.1 dB(A) 0.1 dB(A) 0.1 dB(A) 0.1 dB(A) 0.1 dB(A) 0.1 dB(A) 0.1 dB(A)

Margin or Allowed additional exposure: 5.0 dB(A)**Sound level always accepted: 35.0 dB(A)**

Project:

Lower Gazegill

Description:

Desktop Noise Assessment for 1no. 20kW CF20 Wind Turbine at Lower Gazegill Farm.
All Calculations have been carried out in line with ETSU-R-97 Guidelines

Printed/Page

28/03/2013 12:37 / 2

Licensed user:

Entrust

Daresbury Innovation Centre Keckwick Lane
GB-DARESBURY WA4 4FS
+44 1925 607 235

Conor McAllister / conor@en-trust.co.uk

Calculated:

28/03/2013 12:36/2.8.579

DECIBEL - Assumptions for noise calculation**Distance demand:****NSA:** Noise sensitive point: British - British (3)-Property 3**Predefined calculation standard:** British**Imission height(a.g.l.):** Use standard value from calculation model**Ambient noise:**

4.0 [m/s]	5.0 [m/s]	6.0 [m/s]	7.0 [m/s]	8.0 [m/s]	9.0 [m/s]	10.0 [m/s]	11.0 [m/s]	12.0 [m/s]
0.1 dB(A)	0.1 dB(A)	0.1 dB(A)	0.1 dB(A)	0.1 dB(A)	0.1 dB(A)	0.1 dB(A)	0.1 dB(A)	0.1 dB(A)

Margin or Allowed additional exposure: 5.0 dB(A)**Sound level always accepted:** 35.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: British - British (4)-Applicant's Dwelling**Predefined calculation standard:** British**Imission height(a.g.l.):** Use standard value from calculation model**Ambient noise:**

4.0 [m/s]	5.0 [m/s]	6.0 [m/s]	7.0 [m/s]	8.0 [m/s]	9.0 [m/s]	10.0 [m/s]	11.0 [m/s]	12.0 [m/s]
0.1 dB(A)	0.1 dB(A)	0.1 dB(A)	0.1 dB(A)	0.1 dB(A)	0.1 dB(A)	0.1 dB(A)	0.1 dB(A)	0.1 dB(A)

Margin or Allowed additional exposure: 5.0 dB(A)**Sound level always accepted:** 45.0 dB(A)**Distance demand:**