

Project:  
**761 Kemptown**

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Kirk Schmidt / kirk.schmidt@al-pro.ca  
Calculated:  
10/3/2014 1:11 PM/2.9.269

**DECIBEL - Main Result**

**Calculation:** Oct 2014 Layout 106 dBA Alternative case

**Noise calculation model:**

ISO 9613-2 General

**Wind speed:**

7.0 m/s

**Ground attenuation:**

Alternative

**Meteorological coefficient, C0:**

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:**

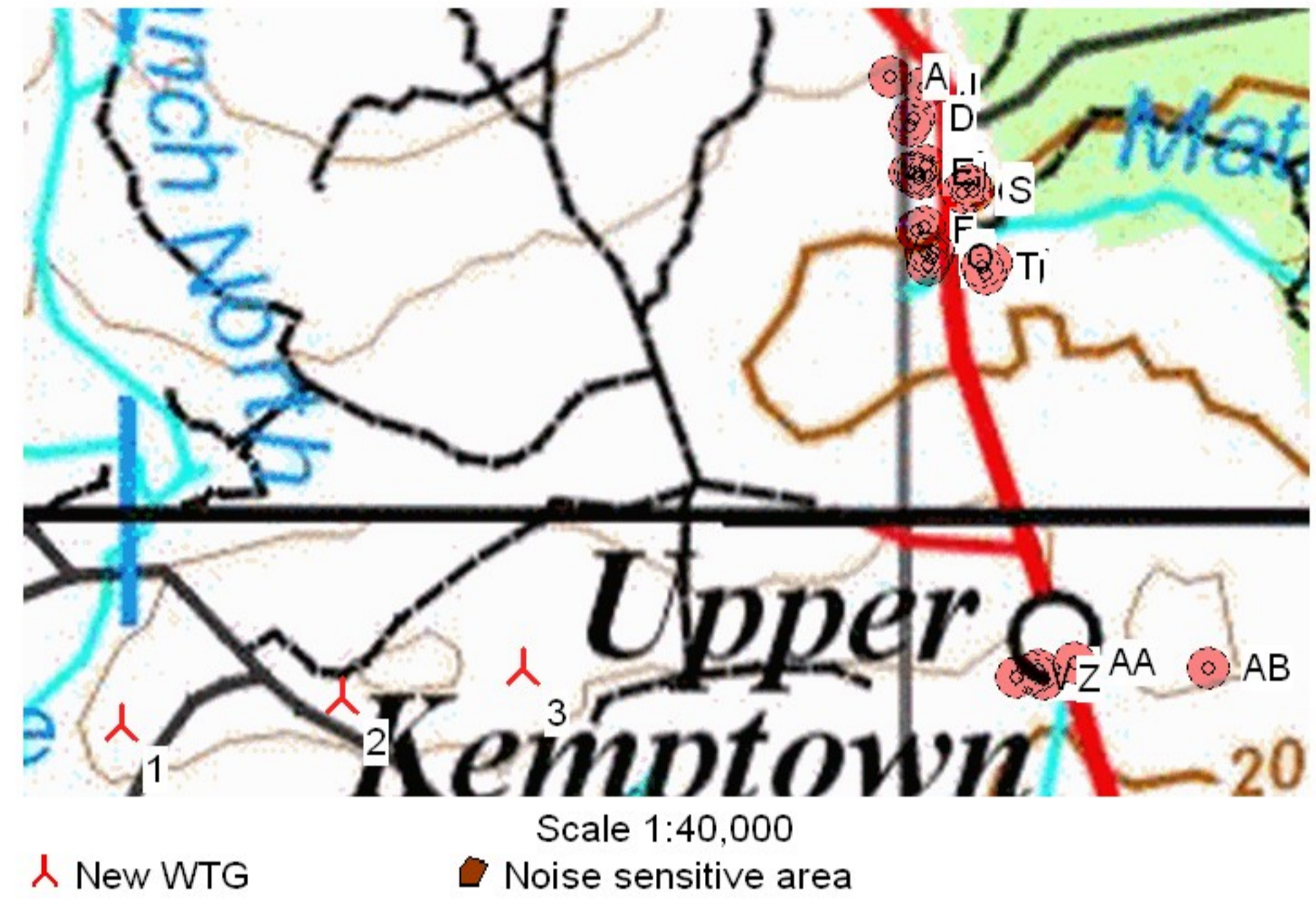
Pure and Impulse tone penalty are added to WTG source noise

**Height above ground level, when no value in NSA object:**

1.5 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**

UTM (north)-NAD83 (US+CA) Zone: 20				WTG type		Noise data			Wind speed	LwA_ref	Pure tones			
East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Creator	Name	[m/s]	[dB(A)]	
1	489,997	5,037,881	234.4	GE WIND ENERGY GE 1.6 ...	Yes	GE WIND ENERGY	GE 1.6-1,600	1,600	82.5	80.0	USER 06.2 1.6 1.68 -82.5 Acoustic Spec	7.0	106.0	0 dB h
2	490,622	5,037,960	244.2	GE WIND ENERGY GE 1.6 ...	Yes	GE WIND ENERGY	GE 1.6-1,600	1,600	82.5	80.0	USER 06.2 1.6 1.68 -82.5 Acoustic Spec	7.0	106.0	0 dB h
3	491,130	5,038,040	241.0	GE WIND ENERGY GE 1.6 ...	Yes	GE WIND ENERGY	GE 1.6-1,600	1,600	82.5	80.0	USER 06.2 1.6 1.68 -82.5 Acoustic Spec	7.0	106.0	0 dB h

h) Generic octave distribution used

**Calculation Results**

**Sound Level**

Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20			Demands		Sound Level		Demands fulfilled ?	
No.	Name	East	North	Z	Imission height	Noise	From WTGs	Distance to noise demand	Noise	
				[m]	[m]	[dB(A)]	[dB(A)]	[m]		
A	Noise sensitive point: (1)	492,164	5,039,708	221.4	1.5	40.0	26.6	1,423	Yes	
B	Noise sensitive point: (2)	492,218	5,039,437	210.0	1.5	40.0	27.6	1,232	Yes	
C	Noise sensitive point: (3)	492,221	5,039,568	216.3	1.5	40.0	27.0	1,338	Yes	
D	Noise sensitive point: (4)	492,231	5,039,590	217.1	1.5	40.0	26.9	1,361	Yes	
E	Noise sensitive point: (5)	492,235	5,039,435	209.4	1.5	40.0	27.5	1,240	Yes	
F	Noise sensitive point: (6)	492,240	5,039,275	200.0	1.5	40.0	28.2	1,121	Yes	
G	Noise sensitive point: (7)	492,247	5,039,420	208.1	1.5	40.0	27.5	1,236	Yes	
H	Noise sensitive point: (8)	492,247	5,039,432	208.8	1.5	40.0	27.5	1,245	Yes	
I	Noise sensitive point: (9)	492,260	5,039,282	200.0	1.5	40.0	28.0	1,140	Yes	
J	Noise sensitive point: (10)	492,262	5,039,678	220.0	1.5	40.0	26.4	1,451	Yes	
K	Noise sensitive point: (11)	492,266	5,039,459	209.6	1.5	40.0	27.3	1,278	Yes	
L	Noise sensitive point: (12)	492,266	5,039,214	196.6	1.5	40.0	28.3	1,094	Yes	
M	Noise sensitive point: (13)	492,269	5,039,177	195.0	1.5	40.0	28.4	1,070	Yes	
N	Noise sensitive point: (14)	492,269	5,039,428	207.8	1.5	40.0	27.4	1,256	Yes	
O	Noise sensitive point: (15)	492,280	5,039,196	195.1	1.5	40.0	28.3	1,091	Yes	
P	Noise sensitive point: (16)	492,284	5,039,214	196.1	1.5	40.0	28.2	1,107	Yes	
Q	Noise sensitive point: (17)	492,365	5,039,383	201.6	1.5	40.0	27.1	1,285	Yes	
R	Noise sensitive point: (18)	492,385	5,039,401	201.6	1.5	40.0	27.0	1,312	Yes	
S	Noise sensitive point: (19)	492,400	5,039,388	200.2	1.5	40.0	27.0	1,313	Yes	
T	Noise sensitive point: (20)	492,422	5,039,170	195.9	1.5	40.0	27.7	1,177	Yes	
U	Noise sensitive point: (21)	492,432	5,039,154	196.5	1.5	40.0	27.7	1,174	Yes	
V	Noise sensitive point: (22)	492,447	5,039,181	195.5	1.5	40.0	27.5	1,203	Yes	
W	Noise sensitive point: (23)	492,522	5,038,018	217.8	1.5	40.0	29.9	840	Yes	
X	Noise sensitive point: (24)	492,568	5,038,026	216.4	1.5	40.0	29.5	885	Yes	

To be continued on next page...



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**DECIBEL - Main Result****Calculation:** Oct 2014 Layout 106 dBA Alternative case

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Noise sensitive area No.	Name	UTM (north)-NAD83 (US+CA) Zone: 20			Imission height [m]	Demands Noise [dB(A)]	Sound Level		Distance to noise demand [m]	Demands fulfilled ? Noise
		East	North	Z			From WTGs [dB(A)]			
	Y Noise sensitive point: (25)	492,581	5,038,037	216.8	1.5	40.0	29.4	898	Yes	
	Z Noise sensitive point: (26)	492,597	5,038,013	214.2	1.5	40.0	29.2	915	Yes	
	AA Noise sensitive point: (27)	492,685	5,038,057	215.0	1.5	40.0	28.6	1,002	Yes	
	AB Noise sensitive point: (28)	493,060	5,038,039	225.0	1.5	40.0	26.3	1,377	Yes	

**Distances (m)**

NSA	WTG		
	1	2	3
A	2834	2331	1962
B	2712	2175	1771
C	2791	2268	1878
D	2813	2290	1901
E	2725	2186	1780
F	2641	2085	1661
G	2726	2185	1775
H	2733	2193	1785
I	2662	2105	1679
J	2891	2375	1991
K	2764	2225	1818
L	2632	2068	1634
M	2616	2048	1609
N	2749	2206	1796
O	2635	2068	1631
P	2647	2082	1646
Q	2804	2250	1825
R	2831	2277	1851
S	2836	2280	1852
T	2746	2169	1716
U	2748	2168	1714
V	2774	2196	1743
W	2529	1901	1392
X	2575	1947	1438
Y	2589	1961	1451
Z	2603	1976	1467
AA	2694	2065	1555
AB	3067	2439	1930



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**DECIBEL - Detailed results****Calculation:** Oct 2014 Layout 106 dBA Alternative case **Noise calculation model:** ISO 9613-2 General 7.0 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 Noise sensitive point: (1)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,834	2,836	46.3	Yes	<b>18.85</b>	106.0	3.01	80.05	5.86	4.24	0.00	0.00	90.16	0.00	
2	2,331	2,333	52.1	Yes	<b>21.47</b>	106.0	3.01	78.36	5.14	4.04	0.00	0.00	87.53	0.00	
3	1,962	1,965	56.4	Yes	<b>23.76</b>	106.0	3.01	76.87	4.56	3.82	0.00	0.00	85.25	0.00	
Sum	26.58														

**Noise sensitive area: B Noise sensitive point: (2)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,712	2,714	42.3	Yes	<b>19.38</b>	106.0	3.01	79.67	5.69	4.27	0.00	0.00	89.63	0.00	
2	2,175	2,177	48.9	Yes	<b>22.32</b>	106.0	3.01	77.76	4.90	4.03	0.00	0.00	86.69	0.00	
3	1,771	1,774	53.9	Yes	<b>25.02</b>	106.0	3.01	75.98	4.25	3.76	0.00	0.00	83.99	0.00	
Sum	27.60														

**Noise sensitive area: C Noise sensitive point: (3)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,791	2,793	44.9	Yes	<b>19.03</b>	106.0	3.01	79.92	5.80	4.25	0.00	0.00	89.97	0.00	
2	2,268	2,270	50.9	Yes	<b>21.81</b>	106.0	3.01	78.12	5.04	4.03	0.00	0.00	87.19	0.00	
3	1,878	1,880	56.3	Yes	<b>24.32</b>	106.0	3.01	76.48	4.43	3.77	0.00	0.00	84.68	0.00	
Sum	27.01														

**Noise sensitive area: D Noise sensitive point: (4)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,813	2,814	45.2	Yes	<b>18.94</b>	106.0	3.01	79.99	5.83	4.25	0.00	0.00	90.07	0.00	
2	2,290	2,293	51.1	Yes	<b>21.69</b>	106.0	3.01	78.21	5.08	4.04	0.00	0.00	87.32	0.00	
3	1,901	1,904	56.6	Yes	<b>24.17</b>	106.0	3.01	76.59	4.46	3.78	0.00	0.00	84.84	0.00	
Sum	26.87														



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**DECIBEL - Detailed results****Calculation:** Oct 2014 Layout 106 dBA Alternative case **Noise calculation model:** ISO 9613-2 General 7.0 m/s**Noise sensitive area: E Noise sensitive point: (5)**

WTG		Wind speed: 7.0 m/s													
No.	Distance	Sound distance	Mean height	Visible	Calculated	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A	Cmet	
	[m]	[m]	[m]		[dB(A)]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
1	2,725	2,727	42.1	Yes	<b>19.31</b>	106.0	3.01	79.71	5.71	4.27	0.00	0.00	89.69	0.00	
2	2,186	2,189	48.8	Yes	<b>22.25</b>	106.0	3.01	77.80	4.92	4.04	0.00	0.00	86.76	0.00	
3	1,780	1,783	53.7	Yes	<b>24.95</b>	106.0	3.01	76.02	4.26	3.77	0.00	0.00	84.05	0.00	
Sum	27.53														

**Noise sensitive area: F Noise sensitive point: (6)**

WTG		Wind speed: 7.0 m/s													
No.	Distance	Sound distance	Mean height	Visible	Calculated	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A	Cmet	
	[m]	[m]	[m]		[dB(A)]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
1	2,641	2,643	37.6	Yes	<b>19.66</b>	106.0	3.01	79.44	5.59	4.31	0.00	0.00	89.35	0.00	
2	2,085	2,089	44.1	Yes	<b>22.77</b>	106.0	3.01	77.40	4.76	4.08	0.00	0.00	86.23	0.00	
3	1,661	1,665	48.7	Yes	<b>25.72</b>	106.0	3.01	75.43	4.06	3.80	0.00	0.00	83.28	0.00	
Sum	28.16														

**Noise sensitive area: G Noise sensitive point: (7)**

WTG		Wind speed: 7.0 m/s													
No.	Distance	Sound distance	Mean height	Visible	Calculated	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A	Cmet	
	[m]	[m]	[m]		[dB(A)]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
1	2,726	2,728	41.6	Yes	<b>19.30</b>	106.0	3.01	79.72	5.71	4.28	0.00	0.00	89.71	0.00	
2	2,185	2,188	48.5	Yes	<b>22.25</b>	106.0	3.01	77.80	4.91	4.04	0.00	0.00	86.76	0.00	
3	1,775	1,779	53.1	Yes	<b>24.97</b>	106.0	3.01	76.00	4.26	3.78	0.00	0.00	84.03	0.00	
Sum	27.54														

**Noise sensitive area: H Noise sensitive point: (8)**

WTG		Wind speed: 7.0 m/s													
No.	Distance	Sound distance	Mean height	Visible	Calculated	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A	Cmet	
	[m]	[m]	[m]		[dB(A)]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
1	2,733	2,735	41.9	Yes	<b>19.27</b>	106.0	3.01	79.74	5.72	4.28	0.00	0.00	89.73	0.00	
2	2,193	2,196	48.7	Yes	<b>22.21</b>	106.0	3.01	77.83	4.93	4.04	0.00	0.00	86.80	0.00	
3	1,785	1,788	53.4	Yes	<b>24.91</b>	106.0	3.01	76.05	4.27	3.77	0.00	0.00	84.10	0.00	
Sum	27.49														

**Noise sensitive area: I Noise sensitive point: (9)**

WTG		Wind speed: 7.0 m/s													
No.	Distance	Sound distance	Mean height	Visible	Calculated	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A	Cmet	
	[m]	[m]	[m]		[dB(A)]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
1	2,662	2,664	37.8	Yes	<b>19.56</b>	106.0	3.01	79.51	5.62	4.31	0.00	0.00	89.44	0.00	
2	2,105	2,109	44.3	Yes	<b>22.65</b>	106.0	3.01	77.48	4.79	4.08	0.00	0.00	86.35	0.00	
3	1,679	1,683	48.8	Yes	<b>25.58</b>	106.0	3.01	75.52	4.09	3.80	0.00	0.00	83.42	0.00	
Sum	28.04														

**Noise sensitive area: J Noise sensitive point: (10)**

WTG		Wind speed: 7.0 m/s													
No.	Distance	Sound distance	Mean height	Visible	Calculated	LwA,ref	Dc	Adiv	Aatm	Agr	Abar	Amisc	A	Cmet	
	[m]	[m]	[m]		[dB(A)]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
1	2,891	2,893	46.2	Yes	<b>18.59</b>	106.0	3.01	80.23	5.94	4.25	0.00	0.00	90.42	0.00	
2	2,375	2,377	52.0	Yes	<b>21.23</b>	106.0	3.01	78.52	5.20	4.05	0.00	0.00	87.78	0.00	
3	1,991	1,994	57.3	Yes	<b>23.59</b>	106.0	3.01	76.99	4.61	3.81	0.00	0.00	85.42	0.00	
Sum	26.37														



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**DECIBEL - Detailed results****Calculation:** Oct 2014 Layout 106 dBA Alternative case **Noise calculation model:** ISO 9613-2 General 7.0 m/s**Noise sensitive area: K Noise sensitive point: (11)****WTG****Wind speed: 7.0 m/s**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,764	2,766	42.4	Yes	<b>19.13</b>	106.0	3.01	79.84	5.76	4.28	0.00	0.00	89.87	0.00
2	2,225	2,228	49.2	Yes	<b>22.03</b>	106.0	3.01	77.96	4.98	4.04	0.00	0.00	86.98	0.00
3	1,818	1,821	53.9	Yes	<b>24.69</b>	106.0	3.01	76.21	4.33	3.78	0.00	0.00	84.32	0.00
Sum	27.29													

**Noise sensitive area: L Noise sensitive point: (12)****WTG****Wind speed: 7.0 m/s**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,632	2,634	35.4	Yes	<b>19.67</b>	106.0	3.01	79.41	5.58	4.34	0.00	0.00	89.33	0.00
2	2,068	2,072	41.9	Yes	<b>22.84</b>	106.0	3.01	77.33	4.73	4.11	0.00	0.00	86.17	0.00
3	1,634	1,638	46.5	Yes	<b>25.88</b>	106.0	3.01	75.29	4.02	3.82	0.00	0.00	83.13	0.00
Sum	28.27													

**Noise sensitive area: M Noise sensitive point: (13)****WTG****Wind speed: 7.0 m/s**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,616	2,618	34.4	Yes	<b>19.74</b>	106.0	3.01	79.36	5.55	4.35	0.00	0.00	89.27	0.00
2	2,048	2,052	41.0	Yes	<b>22.94</b>	106.0	3.01	77.24	4.70	4.12	0.00	0.00	86.06	0.00
3	1,609	1,614	45.7	Yes	<b>26.04</b>	106.0	3.01	75.16	3.97	3.83	0.00	0.00	82.96	0.00
Sum	28.41													

**Noise sensitive area: N Noise sensitive point: (14)****WTG****Wind speed: 7.0 m/s**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,749	2,751	41.7	Yes	<b>19.19</b>	106.0	3.01	79.79	5.74	4.28	0.00	0.00	89.81	0.00
2	2,206	2,209	48.5	Yes	<b>22.12</b>	106.0	3.01	77.88	4.95	4.05	0.00	0.00	86.88	0.00
3	1,796	1,799	53.1	Yes	<b>24.83</b>	106.0	3.01	76.10	4.29	3.79	0.00	0.00	84.18	0.00
Sum	27.40													

**Noise sensitive area: O Noise sensitive point: (15)****WTG****Wind speed: 7.0 m/s**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,635	2,637	34.9	Yes	<b>19.65</b>	106.0	3.01	79.42	5.58	4.35	0.00	0.00	89.35	0.00
2	2,068	2,072	41.5	Yes	<b>22.83</b>	106.0	3.01	77.33	4.73	4.11	0.00	0.00	86.18	0.00
3	1,631	1,635	46.1	Yes	<b>25.89</b>	106.0	3.01	75.27	4.01	3.83	0.00	0.00	83.11	0.00
Sum	28.28													

**Noise sensitive area: P Noise sensitive point: (16)****WTG****Wind speed: 7.0 m/s**

No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	2,647	2,650	35.3	Yes	<b>19.60</b>	106.0	3.01	79.46	5.60	4.34	0.00	0.00	89.41	0.00
2	2,082	2,086	41.9	Yes	<b>22.75</b>	106.0	3.01	77.39	4.76	4.11	0.00	0.00	86.25	0.00
3	1,646	1,651	46.5	Yes	<b>25.78</b>	106.0	3.01	75.35	4.04	3.83	0.00	0.00	83.22	0.00
Sum	28.18													



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**DECIBEL - Detailed results****Calculation:** Oct 2014 Layout 106 dBA Alternative case **Noise calculation model:** ISO 9613-2 General 7.0 m/s**Noise sensitive area: Q Noise sensitive point: (17)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,804	2,806	39.5	Yes	<b>18.90</b>	106.0	3.01	79.96	5.82	4.32	0.00	0.00	90.10	0.00	
2	2,250	2,253	46.2	Yes	<b>21.84</b>	106.0	3.01	78.06	5.02	4.10	0.00	0.00	87.17	0.00	
3	1,825	1,828	50.5	Yes	<b>24.57</b>	106.0	3.01	76.24	4.34	3.85	0.00	0.00	84.43	0.00	
Sum	27.13														

**Noise sensitive area: R Noise sensitive point: (18)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,831	2,833	39.7	Yes	<b>18.78</b>	106.0	3.01	80.04	5.86	4.32	0.00	0.00	90.22	0.00	
2	2,277	2,280	46.5	Yes	<b>21.69</b>	106.0	3.01	78.16	5.06	4.10	0.00	0.00	87.32	0.00	
3	1,851	1,855	50.8	Yes	<b>24.39</b>	106.0	3.01	76.37	4.38	3.86	0.00	0.00	84.61	0.00	
Sum	26.97														

**Noise sensitive area: S Noise sensitive point: (19)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,836	2,839	39.2	Yes	<b>18.75</b>	106.0	3.01	80.06	5.86	4.33	0.00	0.00	90.25	0.00	
2	2,280	2,284	45.9	Yes	<b>21.66</b>	106.0	3.01	78.17	5.06	4.11	0.00	0.00	87.35	0.00	
3	1,852	1,856	50.3	Yes	<b>24.38</b>	106.0	3.01	76.37	4.38	3.87	0.00	0.00	84.63	0.00	
Sum	26.95														

**Noise sensitive area: T Noise sensitive point: (20)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,746	2,749	35.3	Yes	<b>19.12</b>	106.0	3.01	79.78	5.74	4.36	0.00	0.00	89.88	0.00	
2	2,169	2,173	42.1	Yes	<b>22.24</b>	106.0	3.01	77.74	4.89	4.14	0.00	0.00	86.77	0.00	
3	1,716	1,721	46.6	Yes	<b>25.26</b>	106.0	3.01	75.72	4.16	3.87	0.00	0.00	83.74	0.00	
Sum	27.67														

**Noise sensitive area: U Noise sensitive point: (21)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,748	2,750	35.4	Yes	<b>19.12</b>	106.0	3.01	79.79	5.74	4.36	0.00	0.00	89.89	0.00	
2	2,168	2,172	42.2	Yes	<b>22.24</b>	106.0	3.01	77.74	4.89	4.13	0.00	0.00	86.76	0.00	
3	1,714	1,718	46.7	Yes	<b>25.28</b>	106.0	3.01	75.70	4.15	3.87	0.00	0.00	83.72	0.00	
Sum	27.69														

**Noise sensitive area: V Noise sensitive point: (22)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,774	2,776	35.4	Yes	<b>19.00</b>	106.0	3.01	79.87	5.78	4.36	0.00	0.00	90.01	0.00	
2	2,196	2,199	42.2	Yes	<b>22.08</b>	106.0	3.01	77.85	4.93	4.14	0.00	0.00	86.92	0.00	
3	1,743	1,747	46.6	Yes	<b>25.07</b>	106.0	3.01	75.85	4.20	3.88	0.00	0.00	83.93	0.00	
Sum	27.50														



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**DECIBEL - Detailed results****Calculation:** Oct 2014 Layout 106 dBA Alternative case **Noise calculation model:** ISO 9613-2 General 7.0 m/s**Noise sensitive area: W Noise sensitive point: (23)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,529	2,531	40.4	Yes	20.26	106.0	3.01	79.06	5.43	4.25	0.00	0.00	88.75	0.00	
2	1,901	1,904	44.8	Yes	23.96	106.0	3.01	76.59	4.46	3.99	0.00	0.00	85.05	0.00	
3	1,392	1,396	46.1	Yes	27.86	106.0	3.01	73.90	3.58	3.66	0.00	0.00	81.14	0.00	
Sum	29.85														

**Noise sensitive area: X Noise sensitive point: (24)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,575	2,577	39.5	Yes	20.01	106.0	3.01	79.22	5.50	4.27	0.00	0.00	88.99	0.00	
2	1,947	1,950	44.0	Yes	23.64	106.0	3.01	76.80	4.54	4.03	0.00	0.00	85.37	0.00	
3	1,438	1,442	45.2	Yes	27.44	106.0	3.01	74.18	3.67	3.72	0.00	0.00	81.57	0.00	
Sum	29.47														

**Noise sensitive area: Y Noise sensitive point: (25)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,589	2,590	39.5	Yes	19.94	106.0	3.01	79.27	5.51	4.28	0.00	0.00	89.06	0.00	
2	1,961	1,963	43.9	Yes	23.55	106.0	3.01	76.86	4.56	4.03	0.00	0.00	85.45	0.00	
3	1,451	1,455	45.0	Yes	27.32	106.0	3.01	74.25	3.69	3.73	0.00	0.00	81.68	0.00	
Sum	29.37														

**Noise sensitive area: Z Noise sensitive point: (26)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,603	2,605	39.2	Yes	19.87	106.0	3.01	79.32	5.54	4.28	0.00	0.00	89.14	0.00	
2	1,976	1,979	43.7	Yes	23.45	106.0	3.01	76.93	4.59	4.04	0.00	0.00	85.56	0.00	
3	1,467	1,471	44.8	Yes	27.18	106.0	3.01	74.35	3.72	3.75	0.00	0.00	81.82	0.00	
Sum	29.25														

**Noise sensitive area: AA Noise sensitive point: (27)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	2,694	2,696	38.2	Yes	19.41	106.0	3.01	79.61	5.66	4.31	0.00	0.00	89.59	0.00	
2	2,065	2,068	42.7	Yes	22.87	106.0	3.01	77.31	4.73	4.09	0.00	0.00	86.13	0.00	
3	1,555	1,559	43.7	Yes	26.44	106.0	3.01	74.85	3.88	3.84	0.00	0.00	82.57	0.00	
Sum	28.58														

**Noise sensitive area: AB Noise sensitive point: (28)**

WTG		Wind speed: 7.0 m/s													
No.	Distance [m]	Sound distance [m]	Mean height [m]	Visible	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]	
1	3,067	3,068	45.3	Yes	17.80	106.0	3.01	80.74	6.17	4.30	0.00	0.00	91.21	0.00	
2	2,439	2,441	49.6	Yes	20.85	106.0	3.01	78.75	5.30	4.10	0.00	0.00	88.15	0.00	
3	1,930	1,932	49.8	Yes	23.86	106.0	3.01	76.72	4.51	3.92	0.00	0.00	85.15	0.00	
Sum	26.28														



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 10/3/2014 1:11 PM/2.9.269

**DECIBEL - Assumptions for noise calculation**

**Calculation:** Oct 2014 Layout 106 dBA Alternative case **Noise calculation model:** ISO 9613-2 General 7.0 m/s

**Noise calculation model:**

ISO 9613-2 General

**Wind speed:**

7.0 m/s

**Ground attenuation:**

Alternative

**Meteorological coefficient, C0:**

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 and Impulse tone penalty are added to WTG source noise

**Height above ground level, when no value in NSA object:**

1.5 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:** GE WIND ENERGY GE 1.6 1600 82.5 IO!

**Noise:** 06.2 1.6 1.68 -82.5 Acoustic Spec

Source	Source/Date	Creator	Edited
GE	11/6/2012	USER	10/3/2014 11:15 AM

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]	[dB]
From Windcat	80.0	7.0	106.0	No	Generic data	87.6	94.6	98.0	100.6	100.4	97.5	92.7	83.2

**NSA:** Noise sensitive point: (1)-A

**Predefined calculation standard:**

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

**Noise demand:** 40.0 dB(A)

**Distance demand:**

**NSA:** Noise sensitive point: (2)-B

**Predefined calculation standard:**

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

**Noise demand:** 40.0 dB(A)

**Distance demand:**

**NSA:** Noise sensitive point: (3)-C

**Predefined calculation standard:**

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

**Noise demand:** 40.0 dB(A)

**Distance demand:**



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**DECIBEL - Assumptions for noise calculation****Calculation:** Oct 2014 Layout 106 dBA Alternative case **Noise calculation model:** ISO 9613-2 General 7.0 m/s**NSA:** Noise sensitive point: (4)-D**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (5)-E**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (6)-F**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (7)-G**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (8)-H**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (9)-I**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (10)-J**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (11)-K**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:**



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**DECIBEL - Assumptions for noise calculation****Calculation:** Oct 2014 Layout 106 dBA Alternative case **Noise calculation model:** ISO 9613-2 General 7.0 m/s**NSA:** Noise sensitive point: (12)-L**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (13)-M**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (14)-N**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (15)-O**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (16)-P**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (17)-Q**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (18)-R**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (19)-S**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:**



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**DECIBEL - Assumptions for noise calculation****Calculation:** Oct 2014 Layout 106 dBA Alternative case **Noise calculation model:** ISO 9613-2 General 7.0 m/s**NSA:** Noise sensitive point: (20)-T**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (21)-U**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (22)-V**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (23)-W**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (24)-X**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (25)-Y**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (26)-Z**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:****NSA:** Noise sensitive point: (27)-AA**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Distance demand:**



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## DECIBEL - Assumptions for noise calculation

**Calculation:** Oct 2014 Layout 106 dBA Alternative case **Noise calculation model:** ISO 9613-2 General 7.0 m/s

**NSA:** Noise sensitive point: (28)-AB

**Predefined calculation standard:**

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

**Noise demand:** 40.0 dB(A)

**Distance demand:**