

Project:
715027 SS

Licensed user:
Pondera Consult B.V.
Welbergweg 49
NL-7556 PE Hengelo
0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
29-9-2016 19:18/3.0.654

SHADOW - Main Result

Calculation: SS alt 2a - referentiewoningen
Assumptions for shadow calculations

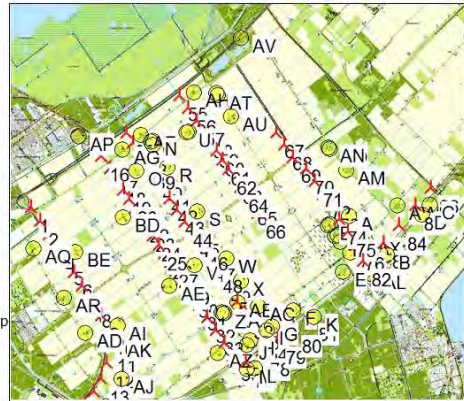
Maximum distance for influence 1. WTG distance circle radius
Minimum sun height over horizon for influence 5 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0,24 0,32 0,36 0,44 0,44 0,41 0,43 0,43 0,38 0,35 0,24 0,22

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
410 492 775 511 375 515 872 1.259 950 781 623 493 8.056
Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: 715027 SS_EMDGrid_0.wp
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in Dutch Stereo-RD/NAP 2000



WTGs

X (east)	Y (north)	Z [m]	Row data/Description	WTG type			Shadow data				
				Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM
1	149.446	487.891	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
2	149.783	487.394	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
3	150.121	486.912	-7,3 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
4	150.442	486.453	-6,4 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
5	150.762	485.995	-5,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
6	151.085	485.536	-6,5 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
7	151.407	485.078	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
8	151.839	484.474	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
9	152.145	483.982	-5,8 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
10	152.334	483.434	-5,8 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
11	152.406	482.861	-5,1 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
12	152.338	482.291	-5,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
13	152.143	481.734	-5,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
14	151.864	481.273	-5,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
15	151.498	480.827	-4,7 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
16	152.148	489.730	-6,6 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
17	152.467	489.270	-7,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
18	152.767	488.836	-5,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
19	152.994	488.507	-6,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
20	153.222	488.178	-6,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
21	153.450	487.850	-6,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
22	153.678	487.521	-6,1 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
23	153.906	487.192	-5,6 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
24	154.134	486.863	-6,3 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
25	154.362	486.534	-5,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
26	154.577	486.221	-6,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
27	154.793	485.908	-5,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
28	155.012	485.598	-5,1 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
29	155.241	485.282	-6,8 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
30	155.569	484.828	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
31	155.898	484.375	-4,7 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
32	156.227	483.921	-5,8 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
33	156.555	483.468	-5,1 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
34	156.884	483.014	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
35	157.209	482.564	-5,4 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
36	153.108	490.557	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
37	153.353	490.208	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	

To be continued on next page...

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29-9-2016 19:18/3.0.654

SHADOW - Main Result

Calculation: SS alt 2a - referentiewoningen

...continued from previous page

	X (east)	Y (north)	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.					Calculation distance [m]	RPM
38	153.601	489.855	-5,6	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
39	153.899	489.431	-6,9	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
40	154.185	489.023	-7,0	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
41	154.506	488.575	-7,0	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
42	154.768	488.184	-6,6	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
43	155.059	487.779	-6,4	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
44	155.360	487.352	-6,7	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
45	155.614	487.001	-6,0	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
46	155.938	486.529	-6,0	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
47	156.229	486.114	-5,7	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
48	156.512	485.712	-5,5	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
49	156.804	485.296	-6,3	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
50	157.087	484.894	-7,0	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
51	157.369	484.492	-6,0	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
52	157.674	484.059	-6,4	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
53	157.937	483.684	-5,4	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
54	158.236	483.259	-5,6	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
55	155.161	491.901	-6,2	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
56	155.484	491.444	-5,2	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
57	155.807	490.986	-4,5	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
58	156.116	490.556	-4,6	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
59	156.347	490.229	-5,1	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
60	156.578	489.902	-5,7	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
61	156.808	489.576	-5,0	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
62	157.039	489.249	-6,0	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
63	157.270	488.922	-5,0	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
64	157.498	488.594	-5,0	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
65	157.833	488.139	-5,7	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
66	158.156	487.682	-6,1	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
67	158.882	490.570	-5,4	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
68	159.193	490.129	-5,6	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
69	159.505	489.688	-5,7	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
70	160.023	489.282	-5,2	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
71	160.347	488.825	-5,9	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
72	160.670	488.367	-5,1	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
73	160.993	487.910	-5,0	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
74	161.316	487.453	-3,7	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
75	161.640	486.996	-5,1	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
76	161.963	486.538	-5,0	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
77	157.709	482.334	-3,4	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
78	158.321	482.740	-2,8	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
79	158.946	483.155	-2,3	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
80	159.546	483.554	-2,6	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
81	160.195	483.985	-1,5	LAGERWEY L100-2.5MW 2520...Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1.200	15,2	
82	162.222	485.956	-5,0	Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	
83	163.008	486.594	-4,6	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
84	163.599	487.243	-4,9	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
85	164.245	487.957	-5,0	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	
86	164.819	488.590	-4,8	Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	

Shadow receptor-Input

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
	[m]	[m]	[m]	[m]	[m]	[m]	[°]	[°]	
A	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
C	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
D	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
E	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
F	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
G	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
H	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"

To be continued on next page...



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SHADOW - Main Result

Calculation: SS alt 2a - referentiewoningen

...continued from previous page

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[°]	[°]	
I	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
J	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
K	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
L	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
M	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
N	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
O	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
P	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Q	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
R	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
S	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
T	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
U	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
V	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
W	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
X	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Y	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Z	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AA	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AB	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AC	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AD	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AE	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AF	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AG	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AH	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AI	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AJ	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AK	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AL	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AM	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AN	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AO	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AP	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AQ	149.533	486.385	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AR	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AS	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AT	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AU	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AV	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AW	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AX	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AY	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AZ	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BA	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BB	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BC	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BD	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BE	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BF	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BG	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BH	161.366	486.618	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

No.	Shadow, worst case			Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]	
A	129:17	201	1:11	27:59	
B	10:39	53	0:24	2:16	
C	71:06	117	0:58	17:05	
D	19:19	44	0:35	4:07	

To be continued on next page...



Project:
715027 SS

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Calculated:
29-9-2016 19:18/3.0.654

SHADOW - Main Result

Calculation: SS alt 2a - referentiewoningen

...continued from previous page

No.	Shadow, worst case		Max shadow hours per day	Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]	Shadow hours per year [h/year]
E	30:27	77	0:32	7:59	25:13
F	41:59	119	0:37	7:17	27:53
G	284:04	359	1:40	52:24	27:53
H	166:37	247	1:32	31:43	27:53
I	327:08	303	2:19	67:48	27:53
J	234:37	344	1:07	46:09	27:53
K	112:45	120	1:41	24:47	27:53
L	28:03	59	0:36	6:14	27:53
M	0:00	0	0:00	0:00	27:53
N	93:38	178	0:50	20:49	27:53
O	135:07	302	0:57	28:24	27:53
P	40:55	110	0:45	8:34	27:53
Q	124:21	215	0:56	27:53	27:53
R	81:52	185	0:50	18:13	27:53
S	60:46	152	0:49	12:41	27:53
T	115:44	216	0:54	26:30	27:53
U	33:34	99	0:41	7:17	27:53
V	119:47	214	1:06	24:11	27:53
W	169:11	279	0:59	35:48	27:53
X	173:56	283	0:59	36:30	27:53
Y	195:06	305	1:20	38:55	27:53
Z	211:53	349	1:21	42:39	27:53
AA	198:23	357	1:15	39:30	27:53
AB	164:39	175	1:21	25:51	27:53
AC	189:49	287	1:14	37:08	27:53
AD	72:12	163	0:41	13:38	27:53
AE	70:41	140	0:50	15:39	27:53
AF	240:53	308	1:14	50:17	27:53
AG	128:57	216	1:10	24:51	27:53
AH	146:55	179	0:59	27:36	27:53
AI	130:23	194	1:06	26:31	27:53
AJ	43:00	95	0:42	10:00	27:53
AK	183:05	190	1:32	40:25	27:53
AL	0:00	0	0:00	0:00	27:53
AM	17:33	82	0:26	3:34	27:53
AN	23:36	75	0:30	4:16	27:53
AO	21:19	72	0:30	4:08	27:53
AP	17:39	47	0:31	2:40	27:53
AQ	32:46	83	0:37	7:27	27:53
AR	18:51	75	0:29	3:50	27:53
AS	44:58	130	0:29	7:53	27:53
AT	40:46	140	0:29	7:18	27:53
AU	19:47	108	0:24	3:41	27:53
AV	0:00	0	0:00	0:00	27:53
AW	105:14	207	0:50	21:31	27:53
AX	175:13	206	1:39	39:33	27:53
AY	49:45	107	0:50	9:34	27:53
AZ	69:15	115	0:57	15:10	27:53
BA	131:38	179	1:11	32:08	27:53
BB	94:43	150	1:09	22:52	27:53
BC	31:29	61	0:41	7:30	27:53
BD	34:19	121	0:40	7:33	27:53
BE	177:25	256	1:06	37:32	27:53
BF	81:01	144	1:01	19:46	27:53
BG	101:23	158	0:57	24:54	27:53
BH	36:34	88	0:46	7:10	27:53

Total amount of flickering on the shadow receptors caused by each WTG
No. Name

1 Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (348)
2 Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (349)

Worst case	Expected
[h/year]	[h/year]
0:00	0:00
0:00	0:00

To be continued on next page...

windPRO 3.0.654 by EMD International A/S, Tel. +45 96 35 44 44, www.emd.dk, windpro@emd.dk

30-9-2016 10:31 / 4



Project:
715027 SS

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Calculated:
29-9-2016 19:18/3.0.654

SHADOW - Main Result

Calculation: SS alt 2a - referentiewoningen

...continued from previous page
No. Name

No.	Name	Worst case [h/year]	Expected [h/year]
3	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (350)	12:01	2:37
4	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (351)	85:04	19:40
5	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (352)	80:16	17:30
6	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (353)	32:50	4:40
7	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (354)	1:54	0:29
8	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (355)	12:14	2:30
9	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (356)	20:26	4:17
10	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (357)	101:34	23:53
11	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (358)	198:47	43:11
12	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (359)	69:36	9:44
13	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (360)	30:43	7:22
14	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (361)	12:17	2:36
15	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (362)	31:29	7:30
16	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (363)	52:59	10:18
17	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (364)	74:08	12:58
18	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (365)	28:25	6:01
19	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (366)	32:30	4:49
20	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (367)	0:00	0:00
21	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (368)	1:50	0:28
22	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (369)	22:39	5:19
23	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (370)	7:42	1:24
24	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (371)	2:08	0:22
25	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (372)	0:00	0:00
26	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (373)	3:07	0:42
27	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (374)	7:59	1:53
28	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (375)	15:35	3:15
29	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (376)	81:10	17:21
30	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (377)	40:58	8:18
31	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (378)	61:31	13:16
32	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (379)	82:04	17:58
33	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (380)	173:22	28:28
34	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (381)	44:44	10:29
35	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (382)	144:57	31:09
36	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (383)	146:33	33:49
37	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (384)	163:15	37:25
38	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (385)	245:42	48:52
39	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (386)	44:33	10:45
40	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (387)	54:30	11:24
41	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (388)	3:36	0:37
42	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (389)	6:03	1:23
43	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (390)	16:30	3:54
44	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (391)	38:13	7:15
45	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (392)	0:00	0:00
46	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (393)	34:02	7:37
47	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (394)	41:09	9:50
48	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (395)	122:29	27:05
49	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (396)	89:08	17:14
50	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (397)	90:30	19:45
51	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (398)	75:45	13:58
52	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (399)	219:57	43:56
53	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (400)	226:37	41:05
54	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (401)	174:04	37:27
55	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (402)	67:13	15:38
56	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (403)	106:01	17:14
57	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (404)	46:05	7:23
58	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (405)	40:13	9:05
59	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (406)	21:54	3:41
60	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (407)	3:51	0:38
61	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (408)	0:00	0:00
62	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (409)	0:00	0:00
63	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (410)	0:00	0:00
64	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (411)	0:00	0:00
65	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (412)	0:00	0:00
66	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (413)	0:00	0:00
67	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (414)	0:00	0:00

To be continued on next page...



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Calculated:
29-9-2016 19:18/3.0.654

SHADOW - Main Result

Calculation: SS alt 2a - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
68	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (415)	0:00	0:00
69	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (416)	8:53	1:52
70	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (417)	30:20	5:38
71	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (418)	8:47	1:51
72	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (419)	4:04	0:36
73	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (420)	37:11	8:19
74	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (421)	155:51	37:34
75	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (422)	198:30	46:34
76	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (423)	139:53	29:08
77	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (424)	151:27	22:33
78	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (425)	181:57	31:13
79	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (426)	242:02	43:00
80	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (427)	32:23	7:15
81	LAGERWEY L100-2.5MW 2520 100.0 !OI! hub: 90,0 m (TOT: 140,0 m) (428)	117:21	25:15
82	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (429)	83:36	17:16
83	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (430)	48:06	11:14
84	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (431)	85:18	15:17
85	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (432)	103:33	25:16
86	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (433)	20:43	5:26

Project:
715027 SS

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Calculated:
29-9-2016 19:40/3.0.654

SHADOW - Main Result

Calculation: SS alt 2b - referentiewoningen
Assumptions for shadow calculations

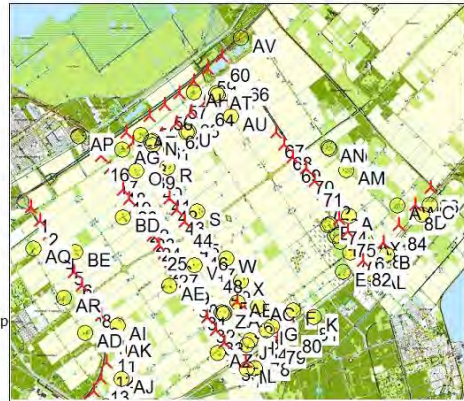
Maximum distance for influence 1. WTG distance circle radius
Minimum sun height over horizon for influence 5 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0,24 0,32 0,36 0,44 0,44 0,41 0,43 0,43 0,38 0,35 0,24 0,22

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
410 492 775 511 375 515 872 1.259 950 781 623 493 8.056
Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: 715027 SS_EMDGrid_0.wp
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in Dutch Stereo-RD/NAP 2000



WTGs

X (east)	Y (north)	Z [m]	Row data/Description	WTG type			Shadow data			
				Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]
1	149.446	487.891	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
2	149.783	487.394	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
3	150.121	486.912	-7,3 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
4	150.442	486.453	-6,4 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
5	150.762	485.995	-5,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
6	151.085	485.536	-6,5 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
7	151.407	485.078	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
8	151.839	484.474	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
9	152.145	483.982	-5,8 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
10	152.334	483.434	-5,8 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
11	152.406	482.861	-5,1 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
12	152.338	482.291	-5,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
13	152.143	481.734	-5,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
14	151.864	481.273	-5,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
15	151.498	480.827	-4,7 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
16	152.148	489.730	-6,6 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
17	152.467	489.270	-7,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
18	152.767	488.836	-5,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
19	152.994	488.507	-6,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
20	153.222	488.178	-6,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
21	153.450	487.850	-6,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
22	153.678	487.521	-6,1 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
23	153.906	487.192	-5,6 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
24	154.134	486.863	-6,3 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
25	154.362	486.534	-5,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
26	154.577	486.221	-6,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
27	154.793	485.908	-5,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
28	155.012	485.598	-5,1 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
29	155.241	485.282	-6,8 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
30	155.569	484.828	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
31	155.898	484.375	-4,7 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
32	156.227	483.921	-5,8 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
33	156.555	483.468	-5,1 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
34	156.884	483.014	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
35	157.209	482.564	-5,4 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
36	153.108	490.557	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
37	153.353	490.208	-6,0 Pondera R136 4000 136.0 IO! ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0

To be continued on next page...

Project:
715027 SS

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Calculatiedat:
29-9-2016 19:40/3.0.654

SHADOW - Main Result

Calculation: SS alt 2b - referentiewoningen

...continued from previous page

X (east)	Y (north)	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
				Valid	Manufact.					Calculation distance [m]	RPM
38	153.601	489.855	-5,6 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	R136-4.000	4.000	136,0	155,0	1.632	0,0
39	153.899	489.431	-6,9 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
40	154.185	489.023	-7,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
41	154.506	488.575	-7,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
42	154.768	488.184	-6,6 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
43	155.059	487.779	-6,4 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
44	155.360	487.352	-6,7 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
45	155.614	487.001	-6,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
46	155.938	486.529	-6,0 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
47	156.229	486.114	-5,7 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
48	156.512	485.712	-5,5 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
49	156.804	485.296	-6,3 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
50	157.087	484.894	-7,0 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
51	157.369	484.492	-6,0 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
52	157.674	484.059	-6,4 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
53	157.937	483.684	-5,4 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
54	158.236	483.259	-5,6 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
55	154.017	491.159	-6,0 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
56	154.587	491.564	-6,0 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
57	155.155	491.973	-5,9 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
58	155.715	492.393	-5,0 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
59	156.252	492.841	-2,7 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
60	156.787	493.293	-4,9 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
61	154.480	490.485	-5,0 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
62	155.051	490.890	-6,0 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
63	155.623	491.294	-5,5 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
64	156.195	491.698	-5,8 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
65	156.927	492.202	-6,5 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
66	157.516	492.617	-4,5 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
67	158.882	490.570	-5,4 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
68	159.193	490.129	-5,6 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
69	159.505	489.688	-5,7 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
70	160.023	489.282	-5,2 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
71	160.347	488.825	-5,9 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
72	160.670	488.367	-5,1 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
73	160.993	487.910	-5,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
74	161.316	487.453	-3,7 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
75	161.640	486.996	-5,1 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
76	161.963	486.538	-5,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
77	157.709	482.334	-3,4 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
78	158.321	482.740	-2,8 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
79	158.946	483.155	-2,3 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
80	159.546	483.554	-2,6 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
81	160.195	483.985	-1,5 LAGERWEY L100-2.5MW 2520...Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1.200	15,2	0,0
82	162.222	485.956	-5,0 Siemens SWT-3.2-113 2A 320...Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0	0,0
83	163.008	486.594	-4,6 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
84	163.599	487.243	-4,9 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
85	164.245	487.957	-5,0 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0
86	164.819	488.590	-4,8 Pondera R136 4000 136.0 IOI ...Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0	0,0

Shadow receptor-Input

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
	[m]	[m]	[m]	[m]	[m]	[m]	[°]	[°]	
A	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
C	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
D	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
E	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
F	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
G	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
H	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"

To be continued on next page...



Project:
715027 SS

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Calculated:
29-9-2016 19:40/3.0.654

SHADOW - Main Result

Calculation: SS alt 2b - referentiewoningen

...continued from previous page

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
I	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
J	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
K	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
L	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
M	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
N	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
O	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
P	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Q	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
R	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
S	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
T	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
U	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
V	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
W	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
X	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Y	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Z	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AA	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AB	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AC	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AD	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AE	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AF	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AG	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AH	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AI	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AJ	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AK	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AL	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AM	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AN	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AO	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AP	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AQ	149.533	486.385	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AR	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AS	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AT	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AU	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AV	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AW	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AX	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AY	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AZ	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BA	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BB	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BC	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BD	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BE	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BF	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BG	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BH	161.366	486.618	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

No.	Shadow, worst case			Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]	
A	129:17	201	1:11	27:59	
B	10:39	53	0:24	2:16	
C	71:06	117	0:58	17:05	
D	19:19	44	0:35	4:07	

To be continued on next page...



Project:
715027 SS

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Calculated:
29-9-2016 19:40/3.0.654

SHADOW - Main Result

Calculation: SS alt 2b - referentiewoningen

...continued from previous page

No.	Shadow, worst case			Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
E	30:27	77	0:32	7:59
F	41:59	119	0:37	7:17
G	284:04	359	1:40	52:24
H	166:37	247	1:32	31:43
I	327:08	303	2:19	67:48
J	234:37	344	1:07	46:09
K	112:45	120	1:41	24:47
L	28:03	59	0:36	6:14
M	0:00	0	0:00	0:00
N	94:27	192	0:50	21:01
O	135:07	302	0:57	28:24
P	22:55	74	0:32	5:05
Q	129:59	247	0:56	29:20
R	81:52	185	0:50	18:13
S	60:46	152	0:49	12:41
T	115:44	216	0:54	26:30
U	27:31	83	0:34	6:13
V	119:47	214	1:06	24:11
W	169:11	279	0:59	35:48
X	173:56	283	0:59	36:30
Y	195:06	305	1:20	38:55
Z	211:53	349	1:21	42:39
AA	198:23	357	1:15	39:30
AB	164:39	175	1:21	25:51
AC	189:49	287	1:14	37:08
AD	72:12	163	0:41	13:38
AE	70:41	140	0:50	15:39
AF	279:37	340	1:20	59:50
AG	135:11	248	1:10	26:29
AH	193:34	222	1:26	39:01
AI	130:23	194	1:06	26:31
AJ	43:00	95	0:42	10:00
AK	183:05	190	1:32	40:25
AL	0:00	0	0:00	0:00
AM	17:33	82	0:26	3:34
AN	23:36	75	0:30	4:16
AO	21:19	72	0:30	4:08
AP	17:39	47	0:31	2:40
AQ	32:46	83	0:37	7:27
AR	18:51	75	0:29	3:50
AS	133:31	215	1:07	29:39
AT	122:26	201	1:07	27:36
AU	22:15	78	0:27	5:00
AV	24:15	56	0:35	4:12
AW	105:14	207	0:50	21:31
AX	175:13	206	1:39	39:33
AY	49:45	107	0:50	9:34
AZ	69:15	115	0:57	15:10
BA	131:38	179	1:11	32:08
BB	94:43	150	1:09	22:52
BC	31:29	61	0:41	7:30
BD	34:19	121	0:40	7:33
BE	177:25	256	1:06	37:32
BF	81:01	144	1:01	19:46
BG	101:23	158	0:57	24:54
BH	36:34	88	0:46	7:10

Total amount of flickering on the shadow receptors caused by each WTG
No. Name

1 Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (434)
2 Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (435)

Worst case [h/year]	Expected [h/year]
0:00	0:00
0:00	0:00

To be continued on next page...

windPRO 3.0.654 by EMD International A/S, Tel. +45 96 35 44 44, www.emd.dk, windpro@emd.dk

30-9-2016 10:41 / 4



Project:
715027 SS

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Calculated:
29-9-2016 19:40/3.0.654

SHADOW - Main Result

Calculation: SS alt 2b - referentiewoningen

...continued from previous page
No. Name

No.	Name	Worst case [h/year]	Expected [h/year]
3	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (436)	12:01	2:37
4	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (437)	85:04	19:40
5	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (438)	80:16	17:30
6	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (439)	32:50	4:40
7	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (440)	1:54	0:29
8	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (441)	12:14	2:30
9	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (442)	20:26	4:17
10	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (443)	101:34	23:53
11	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (444)	198:47	43:11
12	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (445)	69:36	9:44
13	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (446)	30:43	7:22
14	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (447)	12:17	2:36
15	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (448)	31:29	7:30
16	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (449)	52:59	10:18
17	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (450)	74:08	12:58
18	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (451)	28:25	6:01
19	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (452)	32:30	4:49
20	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (453)	0:00	0:00
21	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (454)	1:50	0:28
22	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (455)	22:39	5:19
23	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (456)	7:42	1:24
24	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (457)	2:08	0:22
25	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (458)	0:00	0:00
26	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (459)	3:07	0:42
27	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (460)	7:59	1:53
28	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (461)	15:35	3:15
29	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (462)	81:10	17:21
30	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (463)	40:58	8:18
31	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (464)	61:31	13:16
32	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (465)	82:04	17:58
33	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (466)	173:22	28:28
34	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (467)	44:44	10:29
35	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (468)	144:57	31:09
36	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (469)	146:33	34:01
37	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (470)	163:15	37:25
38	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (471)	245:42	48:52
39	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (472)	44:33	10:45
40	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (473)	54:30	11:24
41	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (474)	3:36	0:37
42	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (475)	6:03	1:23
43	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (476)	16:30	3:54
44	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (477)	38:13	7:15
45	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (478)	0:00	0:00
46	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (479)	34:02	7:37
47	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (480)	41:09	9:50
48	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (481)	122:29	27:05
49	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (482)	89:08	17:14
50	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (483)	90:30	19:45
51	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (484)	75:45	13:58
52	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (485)	219:57	43:56
53	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (486)	226:37	41:05
54	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (487)	174:04	37:27
55	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (488)	11:05	2:31
56	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (489)	11:08	2:09
57	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (490)	73:52	17:55
58	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (491)	47:16	10:34
59	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (492)	0:00	0:00
60	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (493)	24:15	4:12
61	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (494)	59:05	13:54
62	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (495)	25:18	5:07
63	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (496)	69:38	11:45
64	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (497)	186:44	40:10
65	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (498)	11:33	2:51
66	Pondera R136 4000 136.0 IO! hub: 155,0 m (TOT: 223,0 m) (499)	0:37	0:08
67	Siemens SWT-3.2-113 2A 3200 113.0 IO! hub: 92,5 m (TOT: 149,0 m) (500)	0:00	0:00

To be continued on next page...



Project:
715027 SS

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Calculated:
29-9-2016 19:40/3.0.654

SHADOW - Main Result

Calculation: SS alt 2b - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
68	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (501)	0:00	0:00
69	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (502)	8:53	1:52
70	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (503)	30:20	5:38
71	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (504)	8:47	1:51
72	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (505)	4:04	0:36
73	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (506)	37:11	8:19
74	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (507)	155:51	37:34
75	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (508)	198:30	46:34
76	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (509)	139:53	29:08
77	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (510)	151:27	22:33
78	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (511)	181:57	31:13
79	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (512)	242:02	43:00
80	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (513)	32:23	7:15
81	LAGERWEY L100-2.5MW 2520 100.0 !OI! hub: 90,0 m (TOT: 140,0 m) (514)	117:21	25:15
82	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (515)	83:36	17:16
83	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (516)	48:06	11:14
84	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (517)	85:18	15:17
85	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (518)	103:33	25:16
86	Pondera R136 4000 136.0 !OI! hub: 155,0 m (TOT: 223,0 m) (519)	20:43	5:26

Project:
715027 SS

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Calculatiedat:
29-9-2016 20:02/3.0.654

SHADOW - Main Result

Calculation: SS alt 3a - referentiewoningen
Assumptions for shadow calculations

Maximum distance for influence 1. WTG distance circle radius
Minimum sun height over horizon for influence 5 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0,24 0,32 0,36 0,44 0,44 0,41 0,43 0,43 0,38 0,35 0,24 0,22

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
410 492 775 511 375 515 872 1.259 950 781 623 493 8.056
Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: 715027 SS_EMDGrid_0.wp
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in Dutch Stereo-RD/NAP 2000

WTGs

X (east)	Y (north)	Z [m]	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
				Valid	Manufact.					Calculation distance [m]	RPM
1	149.490	487.866	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
2	149.776	487.456	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
3	150.061	487.045	-6,4 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
4	150.347	486.635	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
5	150.632	486.225	-5,6 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
6	150.918	485.814	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
7	151.203	485.404	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
8	151.489	484.993	-5,2 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
9	151.817	484.559	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
10	152.069	484.174	-5,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
11	152.254	483.753	-5,5 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
12	152.366	483.307	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
13	152.403	482.848	-4,8 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
14	152.350	482.321	-5,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
15	152.217	481.862	-5,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
16	152.045	481.498	-4,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
17	151.792	481.124	-3,3 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
18	151.476	480.757	-5,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
19	152.180	489.681	-6,3 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
20	152.459	489.278	-6,8 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
21	152.738	488.875	-4,9 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
22	152.960	488.555	-7,0 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
23	153.182	488.234	-6,1 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
24	153.404	487.914	-6,0 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
25	153.627	487.593	-6,8 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
26	153.849	487.272	-5,9 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
27	154.071	486.952	-6,0 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
28	154.293	486.631	-6,5 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
29	154.515	486.311	-6,0 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
30	154.736	485.990	-6,0 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
31	154.959	485.670	-5,0 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
32	155.192	485.349	-6,2 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
33	155.460	484.981	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
34	155.747	484.584	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
35	156.035	484.187	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
36	156.325	483.792	-5,6 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
37	156.609	483.393	-6,5 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1

To be continued on next page...



Project:
715027 SS

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Calculatied:
29-9-2016 20:02/3.0.654

SHADOW - Main Result

Calculation: SS alt 3a - referentiewoningen

...continued from previous page

X (east)	Y (north)	Z [m]	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
				Valid	Manufact.					Calculation distance [m]	RPM
38	156.897	482.997	-6,0 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
39	157.184	482.600	-5,3 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
40	153.109	490.563	-6,0 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
41	153.354	490.213	-6,1 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
42	153.602	489.860	-5,7 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
43	153.900	489.437	-6,9 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
44	154.187	489.028	-7,0 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
45	154.506	488.575	-7,0 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
46	154.769	488.189	-6,4 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
47	155.061	487.784	-6,6 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
48	155.361	487.357	-6,7 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
49	155.615	487.006	-6,1 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
50	155.939	486.534	-6,0 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
51	156.231	486.119	-5,8 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
52	156.513	485.718	-5,6 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
53	156.805	485.302	-6,3 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
54	157.088	484.899	-6,8 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
55	157.370	484.498	-5,9 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
56	157.675	484.064	-6,3 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
57	157.938	483.689	-5,4 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
58	158.237	483.265	-5,8 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
59	155.061	491.874	-6,5 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
60	155.422	491.538	-4,0 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
61	155.698	491.146	-4,7 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
62	155.930	490.819	-4,6 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
63	156.160	490.493	-5,2 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
64	156.391	490.166	-6,0 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
65	156.622	489.839	-5,0 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
66	156.852	489.512	-5,5 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
67	157.083	489.185	-6,0 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
68	157.314	488.859	-6,0 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
69	157.591	488.467	-5,8 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
70	157.867	488.074	-5,0 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
71	158.144	487.682	-6,2 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
72	158.956	490.494	-5,0 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
73	159.225	490.099	-6,0 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
74	159.497	489.701	-6,0 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
75	160.029	489.298	-5,0 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
76	160.305	488.905	-4,9 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
77	160.581	488.512	-5,0 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
78	160.857	488.120	-5,3 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
79	161.133	487.727	-4,5 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
80	161.406	487.332	-5,9 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
81	161.685	486.942	-5,0 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
82	161.961	486.549	-5,0 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
83	157.577	482.286	-3,4 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
84	158.096	482.618	-5,6 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
85	158.627	482.957	-4,2 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
86	159.158	483.296	-2,3 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
87	159.687	483.638	-1,1 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
88	160.202	484.002	-1,1 LAGERWEY L100-2.5MW...Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1,200	15,2	
89	161.774	485.640	-4,0 LAGERWEY L100-2.5MW...Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1,200	15,2	
90	162.226	485.967	-5,0 Siemens SWT-3.2-113 2... Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1,356	0,0	
91	162.702	486.299	-4,3 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
92	163.007	486.607	-4,2 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
93	163.321	486.952	-4,6 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
94	163.598	487.256	-5,0 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
95	163.941	487.636	-5,0 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
96	164.244	487.970	-4,7 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
97	164.558	488.317	-4,7 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	
98	164.818	488.603	-4,6 VESTAS V117-3.3 GridSt...Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1,404	13,1	



Project:
715027 SS

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Calculatiedat:
29-9-2016 20:02/3.0.654

SHADOW - Main Result

Calculation: SS alt 3a - referentiewoningen

Shadow receptor-Input

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
A	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
C	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
D	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
E	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
F	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
G	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
H	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
I	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
J	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
K	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
L	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
M	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
N	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
O	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
P	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Q	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
R	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
S	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
T	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
U	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
V	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
W	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
X	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Y	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Z	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AA	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AB	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AC	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AD	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AE	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AF	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AG	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AH	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AI	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AJ	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AK	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AL	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AM	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AN	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AO	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AP	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AQ	149.533	486.385	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AR	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AS	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AT	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AU	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AV	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AW	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AX	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AY	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AZ	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BA	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BB	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BC	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BD	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BE	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BF	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BG	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BH	161.366	486.618	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"



Project:
715027 SS

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Calculated:
29-9-2016 20:02/3.0.654

SHADOW - Main Result

Calculation: SS alt 3a - referentiewoningen

Calculation Results

Shadow receptor

No.	Shadow, worst case		Max shadow hours per day	Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]	Shadow hours per year [h/year]
A	170:32	232	1:18	36:23	36:23
B	106:15	145	1:04	23:30	23:30
C	68:34	140	0:51	16:04	16:04
D	72:24	145	0:52	17:00	17:00
E	165:07	118	1:50	41:46	41:46
F	63:56	99	1:11	9:43	9:43
G	195:17	272	1:41	38:04	38:04
H	182:11	230	1:19	31:02	31:02
I	295:21	296	2:00	57:28	57:28
J	196:03	256	1:45	38:14	38:14
K	37:25	83	0:41	8:03	8:03
L	76:46	75	1:25	16:59	16:59
M	0:00	0	0:00	0:00	0:00
N	70:53	155	0:44	15:36	15:36
O	107:48	259	0:54	22:04	22:04
P	88:59	178	0:59	21:06	21:06
Q	93:32	181	0:49	20:49	20:49
R	75:17	182	0:50	16:45	16:45
S	61:21	152	0:49	12:52	12:52
T	82:31	179	0:48	18:54	18:54
U	70:55	150	0:50	17:09	17:09
V	98:27	221	0:59	19:54	19:54
W	122:33	248	0:52	26:20	26:20
X	127:20	254	0:53	27:02	27:02
Y	144:50	286	1:13	30:32	30:32
Z	161:11	292	1:14	33:17	33:17
AA	137:59	251	1:11	28:27	28:27
AB	134:08	161	1:22	20:30	20:30
AC	145:32	263	1:01	28:15	28:15
AD	79:21	202	0:36	16:11	16:11
AE	38:33	87	0:40	8:03	8:03
AF	174:17	244	1:06	36:18	36:18
AG	103:13	214	0:44	19:39	19:39
AH	111:40	176	0:55	20:33	20:33
AI	165:22	236	0:55	34:57	34:57
AJ	57:11	137	0:40	12:48	12:48
AK	137:22	165	1:19	29:12	29:12
AL	12:23	41	0:28	2:50	2:50
AM	9:00	47	0:21	1:47	1:47
AN	13:02	44	0:27	2:10	2:10
AO	15:43	62	0:27	2:44	2:44
AP	11:49	40	0:25	1:39	1:39
AQ	39:31	101	0:35	9:37	9:37
AR	48:52	108	0:36	12:20	12:20
AS	19:16	72	0:25	3:24	3:24
AT	17:37	65	0:25	3:14	3:14
AU	15:03	79	0:18	2:31	2:31
AV	0:00	0	0:00	0:00	0:00
AW	128:56	232	0:56	25:42	25:42
AX	230:39	287	1:38	48:32	48:32
AY	61:02	139	0:50	12:19	12:19
AZ	61:28	109	0:52	13:47	13:47
BA	121:40	210	1:04	28:41	28:41
BB	94:17	165	1:02	22:03	22:03
BC	20:28	46	0:34	4:52	4:52
BD	43:05	117	0:44	9:49	9:49
BE	182:04	271	0:58	36:47	36:47
BF	67:31	144	0:53	15:48	15:48
BG	63:30	121	0:53	15:02	15:02
BH	41:03	103	0:46	8:07	8:07

Project:
715027 SS

Licensed user:
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0031742489940
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Calculated:
29-9-2016 20:02/3.0.654

SHADOW - Main Result

Calculation: SS alt 3a - referentiewoningen

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (520)	0:00	0:00
2	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (521)	0:00	0:00
3	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (522)	0:00	0:00
4	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (523)	72:04	17:07
5	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (524)	59:25	13:56
6	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (525)	90:06	14:35
7	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (526)	0:00	0:00
8	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (527)	39:17	10:16
9	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (528)	9:35	2:05
10	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (529)	0:00	0:00
11	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (530)	115:00	26:40
12	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (531)	70:06	15:17
13	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (532)	141:59	30:11
14	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (533)	55:00	7:40
15	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (534)	34:57	8:04
16	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (535)	15:30	3:16
17	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (536)	6:44	1:23
18	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (537)	20:28	4:52
19	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (538)	31:29	5:52
20	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (539)	58:22	9:58
21	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (540)	20:45	4:22
22	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (541)	32:04	4:48
23	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (542)	0:00	0:00
24	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (543)	0:00	0:00
25	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (544)	29:49	7:24
26	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (545)	10:05	1:53
27	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (546)	3:11	0:33
28	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (547)	0:00	0:00
29	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (548)	2:07	0:29
30	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (549)	6:23	1:28
31	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (550)	13:32	2:51
32	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (551)	31:26	6:10
33	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (552)	40:32	7:56
34	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (553)	42:57	9:09
35	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (554)	44:16	10:25
36	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (555)	76:46	16:15
37	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (556)	100:20	16:04
38	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (557)	33:32	7:43
39	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (558)	114:45	24:59
40	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (559)	99:08	22:58
41	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (560)	128:43	29:18
42	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (561)	189:27	37:41
43	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (562)	41:45	10:01
44	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (563)	54:46	11:28
45	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (564)	3:36	0:37
46	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (565)	6:12	1:25
47	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (566)	16:33	3:55
48	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (567)	38:36	7:23
49	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (568)	0:00	0:00
50	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (569)	27:17	6:06
51	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (570)	30:26	7:15
52	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (571)	96:07	21:09
53	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (572)	58:11	11:39
54	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (573)	67:21	14:44
55	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (574)	49:20	9:16
56	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (575)	169:37	33:00
57	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (576)	179:52	33:00
58	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (577)	119:15	26:06
59	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (578)	30:48	6:49
60	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (579)	92:14	15:54
61	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (580)	18:56	3:03
62	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (581)	58:56	15:22
63	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (582)	33:43	7:01
64	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (583)	19:39	3:12
65	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (584)	1:51	0:16

To be continued on next page...

Project:
715027 SS

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Calculated:
29-9-2016 20:02/3.0.654

SHADOW - Main Result

Calculation: SS alt 3a - referentiewoningen

...continued from previous page
No. Name

No.	Name	Worst case [h/year]	Expected [h/year]
66	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (585)	0:00	0:00
67	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (586)	0:00	0:00
68	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (587)	0:00	0:00
69	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (588)	0:00	0:00
70	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (589)	0:00	0:00
71	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (590)	0:00	0:00
72	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (591)	0:00	0:00
73	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (592)	0:00	0:00
74	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (593)	0:00	0:00
75	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (594)	19:58	3:30
76	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (595)	9:42	1:45
77	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (596)	3:22	0:36
78	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (597)	2:57	0:38
79	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (598)	61:42	13:43
80	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (599)	190:24	42:35
81	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (600)	176:02	41:08
82	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (601)	141:25	29:29
83	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (602)	132:07	23:53
84	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (603)	191:07	30:06
85	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (604)	170:22	27:36
86	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (605)	114:01	22:31
87	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (606)	68:10	12:07
88	LAGERWEY L100-2.5MW 2520 100.0 !OI! hub: 90,0 m (TOT: 140,0 m) (607)	32:53	6:41
89	LAGERWEY L100-2.5MW 2520 100.0 !OI! hub: 90,0 m (TOT: 140,0 m) (608)	149:06	37:29
90	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (609)	82:08	16:35
91	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (610)	168:00	34:23
92	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (611)	35:51	8:24
93	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (612)	22:06	5:15
94	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (613)	47:12	7:55
95	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (614)	120:36	25:39
96	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (615)	78:12	19:04
97	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (616)	17:52	4:41
98	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (617)	0:00	0:00

Project:
715027 SS

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Calculated:
29-9-2016 20:24/3.0.654

SHADOW - Main Result

Calculation: SS alt 3b - referentiewoningen
Assumptions for shadow calculations

Maximum distance for influence 1. WTG distance circle radius
Minimum sun height over horizon for influence 5 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0,24 0,32 0,36 0,44 0,44 0,41 0,43 0,43 0,38 0,35 0,24 0,22

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
410 492 775 511 375 515 872 1.259 950 781 623 493 8.056
Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: 715027 SS_EMDGrid_0.wp
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in Dutch Stereo-RD/NAP 2000



WTGs

X (east)	Y (north)	Z [m]	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
				Valid	Manufact.					Calculation distance [m]	RPM
1	149.490	487.866	-6,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
2	149.776	487.456	-6,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
3	150.061	487.045	-6,4 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
4	150.347	486.635	-6,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
5	150.632	486.225	-5,6 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
6	150.918	485.814	-6,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
7	151.203	485.404	-6,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
8	151.489	484.993	-5,2 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
9	151.817	484.559	-6,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
10	152.069	484.174	-5,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
11	152.254	483.753	-5,5 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
12	152.366	483.307	-6,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
13	152.403	482.848	-4,8 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
14	152.350	482.321	-5,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
15	152.217	481.862	-5,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
16	152.045	481.498	-4,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
17	151.792	481.124	-3,3 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
18	151.476	480.757	-5,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
19	152.180	489.681	-6,3 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
20	152.459	489.278	-6,8 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
21	152.738	488.875	-4,9 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
22	152.960	488.555	-7,0 Siemens SWT-3.2-113 2..Yes	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
23	153.182	488.234	-6,1 Siemens SWT-3.2-113 2..Yes	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
24	153.404	487.914	-6,0 Siemens SWT-3.2-113 2..Yes	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
25	153.627	487.593	-6,8 Siemens SWT-3.2-113 2..Yes	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
26	153.849	487.272	-5,9 Siemens SWT-3.2-113 2..Yes	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
27	154.071	486.952	-6,0 Siemens SWT-3.2-113 2..Yes	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
28	154.293	486.631	-6,5 Siemens SWT-3.2-113 2..Yes	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
29	154.515	486.311	-6,0 Siemens SWT-3.2-113 2..Yes	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
30	154.736	485.990	-6,0 Siemens SWT-3.2-113 2..Yes	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
31	154.959	485.670	-5,0 Siemens SWT-3.2-113 2..Yes	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
32	155.192	485.349	-6,2 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
33	155.460	484.981	-6,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
34	155.747	484.584	-6,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
35	156.035	484.187	-6,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
36	156.325	483.792	-5,6 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
37	156.609	483.393	-6,5 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1
38	156.897	482.997	-6,0 VESTAS V117-3.3 GridS..Yes	Yes	VESTAS	V117-3.3 GridStream-3.300 3.300	3.300	117,0	141,5	1.404	13,1

To be continued on next page...

Project:
715027 SS

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Calculated:
29-9-2016 20:24/3.0.654

SHADOW - Main Result

Calculation: SS alt 3b - referentiewoningen

Shadow receptor-Input

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[°]	[°]	
A	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
C	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
D	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
E	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
F	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
G	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
H	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
I	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
J	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
K	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
L	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
M	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
N	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
O	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
P	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Q	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
R	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
S	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
T	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
U	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
V	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
W	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
X	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Y	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Z	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AA	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AB	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AC	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AD	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AE	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AF	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AG	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AH	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AI	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AJ	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AK	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AL	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AM	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AN	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AO	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AP	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AQ	149.533	486.385	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AR	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AS	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AT	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AU	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AV	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AW	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AX	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AY	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AZ	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BA	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BB	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BC	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BD	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BE	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BF	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BG	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BH	161.366	486.618	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"

Project:
715027 SS

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Calculated:
29-9-2016 20:24/3.0.654

SHADOW - Main Result

Calculation: SS alt 3b - referentiewoningen

Calculation Results

Shadow receptor

No.	Shadow, worst case		Max shadow hours per day	Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]
A	170:32	232	1:18	36:23
B	106:15	145	1:04	23:30
C	68:34	140	0:51	16:04
D	72:24	145	0:52	17:00
E	165:07	118	1:50	41:46
F	63:56	99	1:11	9:43
G	195:17	272	1:41	38:04
H	182:11	230	1:19	31:02
I	295:21	296	2:00	57:28
J	196:03	256	1:45	38:14
K	37:25	83	0:41	8:03
L	76:46	75	1:25	16:59
M	0:00	0	0:00	0:00
N	72:34	170	0:44	16:02
O	107:48	259	0:54	22:04
P	78:40	126	0:51	17:22
Q	101:51	219	0:49	22:58
R	75:17	182	0:50	16:45
S	61:21	152	0:49	12:52
T	82:31	179	0:48	18:54
U	50:20	98	0:46	11:10
V	98:27	221	0:59	19:54
W	122:33	248	0:52	26:20
X	127:20	254	0:53	27:02
Y	144:50	286	1:13	30:32
Z	161:11	292	1:14	33:17
AA	137:59	251	1:11	28:27
AB	134:08	161	1:22	20:30
AC	145:32	263	1:01	28:15
AD	79:21	202	0:36	16:11
AE	38:33	87	0:40	8:03
AF	203:47	277	1:10	43:31
AG	103:13	214	0:44	19:39
AH	206:10	264	1:18	38:50
AI	165:22	236	0:55	34:57
AJ	57:11	137	0:40	12:48
AK	137:22	165	1:19	29:12
AL	12:23	41	0:28	2:50
AM	9:00	47	0:21	1:47
AN	13:02	44	0:27	2:10
AO	15:43	62	0:27	2:44
AP	11:49	40	0:25	1:39
AQ	39:31	101	0:35	9:37
AR	48:52	108	0:36	12:20
AS	129:50	203	1:13	28:55
AT	118:06	185	1:13	27:19
AU	6:11	29	0:20	1:25
AV	44:56	80	0:45	8:12
AW	128:56	232	0:56	25:42
AX	230:39	287	1:38	48:32
AY	61:02	139	0:50	12:19
AZ	61:28	109	0:52	13:47
BA	121:40	210	1:04	28:41
BB	94:17	165	1:02	22:03
BC	20:28	46	0:34	4:52
BD	43:05	117	0:44	9:49
BE	182:04	271	0:58	36:47
BF	67:31	144	0:53	15:48
BG	63:30	121	0:53	15:02
BH	41:03	103	0:46	8:07

Project:
715027 SS

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Calculated:
29-9-2016 20:24/3.0.654

SHADOW - Main Result

Calculation: SS alt 3b - referentiewoningen

Total amount of flickering on the shadow receptors caused by each WTG
No. Name

No.	Name	Worst case [h/year]	Expected [h/year]
1	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (618)	0:00	0:00
2	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (619)	0:00	0:00
3	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (620)	0:00	0:00
4	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (621)	72:04	17:07
5	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (622)	59:25	13:56
6	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (623)	90:06	14:35
7	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (624)	0:00	0:00
8	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (625)	39:17	10:16
9	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (626)	9:35	2:05
10	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (627)	0:00	0:00
11	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (628)	115:00	26:40
12	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (629)	70:06	15:17
13	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (630)	141:59	30:11
14	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (631)	55:00	7:40
15	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (632)	34:57	8:04
16	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (633)	15:30	3:16
17	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (634)	6:44	1:23
18	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (635)	20:28	4:52
19	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (636)	31:29	5:52
20	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (637)	58:22	9:58
21	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (638)	20:45	4:22
22	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (639)	32:04	4:48
23	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (640)	0:00	0:00
24	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (641)	0:00	0:00
25	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (642)	29:49	7:24
26	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (643)	10:05	1:53
27	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (644)	3:11	0:33
28	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (645)	0:00	0:00
29	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (646)	2:07	0:29
30	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (647)	6:23	1:28
31	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (648)	13:32	2:51
32	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (649)	31:26	6:10
33	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (650)	40:32	7:56
34	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (651)	42:57	9:09
35	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (652)	44:16	10:25
36	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (653)	76:46	16:15
37	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (654)	100:20	16:04
38	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (655)	33:32	7:43
39	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (656)	114:45	24:59
40	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (657)	99:08	23:05
41	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (658)	128:43	29:18
42	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (659)	189:27	37:41
43	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (660)	41:45	10:01
44	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (661)	54:46	11:28
45	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (662)	3:36	0:37
46	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (663)	6:12	1:25
47	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (664)	16:33	3:55
48	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (665)	38:36	7:23
49	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (666)	0:00	0:00
50	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (667)	27:17	6:06
51	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (668)	30:26	7:15
52	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (669)	96:07	21:09
53	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (670)	58:11	11:39
54	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (671)	67:21	14:44
55	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (672)	49:20	9:16
56	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (673)	169:37	33:00
57	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (674)	179:52	33:00
58	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (675)	119:15	26:06
59	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (676)	0:00	0:00
60	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (677)	5:22	1:03
61	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (678)	19:52	4:00
62	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (679)	85:44	18:59
63	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (680)	18:34	4:06
64	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (681)	0:00	0:00
65	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (682)	11:30	1:49

To be continued on next page...



Project:
715027 SS

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Calculated:
29-9-2016 20:24/3.0.654

SHADOW - Main Result

Calculation: SS alt 3b - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
66	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (683)	38:42	7:15
67	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (684)	39:23	9:03
68	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (685)	92:20	20:55
69	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (686)	3:25	0:26
70	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (687)	100:37	16:08
71	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (688)	178:03	40:03
72	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (689)	6:59	1:44
73	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (690)	0:03	0:00
74	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (691)	0:00	0:00
75	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (692)	0:00	0:00
76	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (693)	0:00	0:00
77	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (694)	19:58	3:30
78	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (695)	9:42	1:45
79	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (696)	3:22	0:36
80	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (697)	2:57	0:38
81	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (698)	61:42	13:43
82	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (699)	190:24	42:35
83	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (700)	176:02	41:08
84	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (701)	141:25	29:29
85	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (702)	132:07	23:53
86	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (703)	191:07	30:06
87	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (704)	170:22	27:36
88	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (705)	114:01	22:31
89	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (706)	68:10	12:07
90	LAGERWEY L100-2.5MW 2520 100.0 !OI hub: 90,0 m (TOT: 140,0 m) (707)	32:53	6:41
91	LAGERWEY L100-2.5MW 2520 100.0 !OI hub: 90,0 m (TOT: 140,0 m) (708)	149:06	37:29
92	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (709)	82:08	16:35
93	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (710)	168:00	34:23
94	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (711)	35:51	8:24
95	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (712)	22:06	5:15
96	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (713)	47:12	7:55
97	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (714)	120:36	25:39
98	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (715)	78:12	19:04
99	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (716)	17:52	4:41
100	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (717)	0:00	0:00

Project:
715027 SS

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Calculatied:
29-9-2016 20:45/3.0.654

SHADOW - Main Result

Calculation: SS alt 3c - referentiewoningen
Assumptions for shadow calculations

Maximum distance for influence 1. WTG distance circle radius
Minimum sun height over horizon for influence 5 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0,24 0,32 0,36 0,44 0,44 0,41 0,43 0,43 0,38 0,35 0,24 0,22

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
410 492 775 511 375 515 872 1.259 950 781 623 493 8.056
Idle start wind speed: Cut in wind speed from power curve

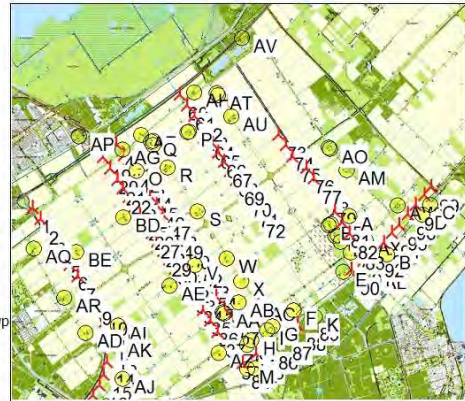
A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: 715027 SS_EMDGrid_0.wp
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in
Dutch Stereo-RD/NAP 2000

WTGs

X (east)	Y (north)	Z [m]	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
				Valid	Manufact.					Calculation distance [m]	RPM
1	149.490	487.866	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
2	149.776	487.456	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
3	150.061	487.045	-6,4 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
4	150.347	486.635	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
5	150.632	486.225	-5,6 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
6	150.918	485.814	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
7	151.203	485.404	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
8	151.489	484.993	-5,2 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
9	151.817	484.559	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
10	152.069	484.174	-5,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
11	152.254	483.753	-5,5 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
12	152.366	483.307	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
13	152.403	482.848	-4,8 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
14	152.350	482.321	-5,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
15	152.217	481.862	-5,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
16	152.045	481.498	-4,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
17	151.792	481.124	-3,3 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
18	151.476	480.757	-5,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
19	152.180	489.681	-6,3 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
20	152.459	489.278	-6,8 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
21	152.738	488.875	-4,9 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
22	152.960	488.555	-7,0 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
23	153.182	488.234	-6,1 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
24	153.404	487.914	-6,0 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
25	153.627	487.593	-6,8 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
26	153.849	487.272	-5,9 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
27	154.071	486.952	-6,0 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
28	154.293	486.631	-6,5 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
29	154.515	486.311	-6,0 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
30	154.736	485.990	-6,0 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
31	154.959	485.670	-5,0 Siemens SWT-3.2-113 2...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
32	155.192	485.349	-6,2 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
33	155.460	484.981	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
34	155.747	484.584	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
35	156.035	484.187	-6,0 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
36	156.325	483.792	-5,6 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
37	156.609	483.393	-6,5 VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1

To be continued on next page...



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Calculatiedat:
29-9-2016 20:45/3.0.654

SHADOW - Main Result

Calculation: SS alt 3c - referentiewoningen

Shadow receptor-Input

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
A	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
C	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
D	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
E	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
F	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
G	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
H	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
I	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
J	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
K	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
L	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
M	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
N	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
O	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
P	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Q	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
R	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
S	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
T	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
U	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
V	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
W	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
X	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Y	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Z	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AA	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AB	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AC	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AD	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AE	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AF	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AG	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AH	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AI	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AJ	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AK	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AL	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AM	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AN	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AO	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AP	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AQ	149.533	486.385	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AR	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AS	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AT	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AU	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AV	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AW	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AX	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AY	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AZ	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BA	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BB	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BC	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BD	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BE	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BF	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BG	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BH	161.366	486.618	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"



Project:
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Calculated:
29-9-2016 20:45/3.0.654

SHADOW - Main Result

Calculation: SS alt 3c - referentiewoningen

Calculation Results

Shadow receptor

No.	Shadow, worst case		Max shadow hours per day	Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]	Shadow hours per year [h/year]
A	170:32	232	1:18	36:23	36:23
B	106:15	145	1:04	23:30	23:30
C	68:34	140	0:51	16:04	16:04
D	72:24	145	0:52	17:00	17:00
E	165:07	118	1:50	41:46	41:46
F	63:56	99	1:11	9:43	9:43
G	128:59	189	1:12	22:43	22:43
H	465:40	334	2:23	102:08	102:08
I	170:02	224	1:28	28:19	28:19
J	196:03	256	1:45	38:14	38:14
K	37:25	83	0:41	8:03	8:03
L	76:46	75	1:25	16:59	16:59
M	0:00	0	0:00	0:00	0:00
N	21:26	89	0:25	3:39	3:39
O	498:21	231	3:14	83:58	83:58
P	88:59	178	0:59	21:06	21:06
Q	35:41	127	0:26	6:15	6:15
R	12:14	69	0:18	2:30	2:30
S	10:28	68	0:18	1:50	1:50
T	20:49	75	0:27	3:41	3:41
U	70:55	150	0:50	17:09	17:09
V	196:52	256	1:53	33:39	33:39
W	38:08	116	0:27	6:46	6:46
X	38:14	117	0:27	6:46	6:46
Y	224:44	325	1:54	42:25	42:25
Z	265:44	336	2:03	50:07	50:07
AA	248:24	296	2:03	45:11	45:11
AB	165:53	295	1:10	31:57	31:57
AC	45:41	130	0:47	7:29	7:29
AD	79:21	202	0:36	16:11	16:11
AE	47:58	126	0:40	10:29	10:29
AF	35:26	103	0:30	6:11	6:11
AG	329:15	221	2:34	62:42	62:42
AH	123:43	186	0:55	23:57	23:57
AI	165:22	236	0:55	34:57	34:57
AJ	57:11	137	0:40	12:48	12:48
AK	137:22	165	1:19	29:12	29:12
AL	12:23	41	0:28	2:50	2:50
AM	9:00	47	0:21	1:47	1:47
AN	13:02	44	0:27	2:10	2:10
AO	15:43	62	0:27	2:44	2:44
AP	11:49	40	0:25	1:39	1:39
AQ	39:31	101	0:35	9:37	9:37
AR	48:52	108	0:36	12:20	12:20
AS	19:16	72	0:25	3:24	3:24
AT	17:37	65	0:25	3:14	3:14
AU	15:03	79	0:18	2:31	2:31
AV	0:00	0	0:00	0:00	0:00
AW	128:56	232	0:56	25:42	25:42
AX	230:39	287	1:38	48:32	48:32
AY	61:02	139	0:50	12:19	12:19
AZ	76:30	155	0:52	17:42	17:42
BA	121:40	210	1:04	28:41	28:41
BB	94:17	165	1:02	22:03	22:03
BC	20:28	46	0:34	4:52	4:52
BD	45:23	126	0:44	10:25	10:25
BE	182:04	271	0:58	36:47	36:47
BF	67:31	144	0:53	15:48	15:48
BG	63:30	121	0:53	15:02	15:02
BH	41:03	103	0:46	8:07	8:07

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29-9-2016 20:45/3.0.654

SHADOW - Main Result

Calculation: SS alt 3c - referentiewoningen

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (718)	0:00	0:00
2	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (719)	0:00	0:00
3	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (720)	0:00	0:00
4	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (721)	72:04	17:07
5	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (722)	59:25	13:56
6	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (723)	90:06	14:35
7	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (724)	0:00	0:00
8	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (725)	39:17	10:16
9	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (726)	9:35	2:05
10	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (727)	0:00	0:00
11	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (728)	115:00	26:40
12	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (729)	70:06	15:17
13	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (730)	141:59	30:11
14	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (731)	55:00	7:40
15	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (732)	34:57	8:04
16	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (733)	15:30	3:16
17	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (734)	6:44	1:23
18	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (735)	20:28	4:52
19	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (736)	31:29	5:52
20	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (737)	58:22	9:30
21	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (738)	20:45	4:19
22	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (739)	32:04	4:23
23	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (740)	0:00	0:00
24	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (741)	0:00	0:00
25	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (742)	29:49	7:24
26	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (743)	10:05	1:53
27	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (744)	3:11	0:33
28	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (745)	0:00	0:00
29	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (746)	2:07	0:29
30	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (747)	6:23	1:28
31	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (748)	13:32	2:52
32	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (749)	31:26	5:38
33	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (750)	40:32	7:46
34	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (751)	42:57	9:09
35	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (752)	44:16	10:24
36	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (753)	76:46	15:20
37	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (754)	100:20	15:53
38	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (755)	33:32	7:44
39	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (756)	114:45	24:59
40	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (757)	16:46	3:35
41	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (758)	248:40	51:20
42	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (759)	98:03	14:33
43	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (760)	386:55	66:11
44	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (761)	53:35	7:24
45	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (762)	0:00	0:00
46	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (763)	2:18	0:35
47	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (764)	1:20	0:16
48	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (765)	3:11	0:39
49	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (766)	5:57	0:53
50	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (767)	0:00	0:00
51	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (768)	0:00	0:00
52	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (769)	6:24	1:21
53	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (770)	111:37	21:06
54	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (771)	87:10	13:54
55	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (772)	47:25	9:25
56	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (773)	62:50	12:13
57	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (774)	223:21	41:43
58	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (775)	93:53	14:11
59	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (776)	342:06	82:08
60	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (777)	42:51	10:07
61	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (778)	92:14	15:54
62	VESTAS V117-3.3 GridStreame 3300 117.0 !OI hub: 141,5 m (TOT: 200,0 m) (779)	18:56	3:03
63	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (780)	58:56	15:22
64	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (781)	33:43	7:01
65	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (782)	19:39	3:12

To be continued on next page...



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Calculated:
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SHADOW - Main Result

Calculation: SS alt 3c - referentiewoningen

...continued from previous page
No. Name

No.	Name	Worst case [h/year]	Expected [h/year]
66	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (783)	1:51	0:16
67	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (784)	0:00	0:00
68	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (785)	0:00	0:00
69	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (786)	0:00	0:00
70	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (787)	0:00	0:00
71	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (788)	0:00	0:00
72	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (789)	0:00	0:00
73	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (790)	0:00	0:00
74	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (791)	0:00	0:00
75	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (792)	0:00	0:00
76	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (793)	19:58	3:30
77	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (794)	9:42	1:45
78	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (795)	3:22	0:36
79	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (796)	2:57	0:38
80	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (797)	61:42	13:43
81	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (798)	190:24	42:35
82	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (799)	176:02	41:08
83	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (800)	141:25	29:29
84	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (801)	132:07	23:53
85	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (802)	191:07	30:06
86	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (803)	170:22	27:38
87	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (804)	114:01	21:22
88	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (805)	68:10	12:08
89	LAGERWEY L100-2.5MW 2520 100.0 !OI! hub: 90,0 m (TOT: 140,0 m) (806)	32:53	6:41
90	LAGERWEY L100-2.5MW 2520 100.0 !OI! hub: 90,0 m (TOT: 140,0 m) (807)	149:06	37:29
91	Siemens SWT-3.2-113 2A 3200 113.0 !OI! hub: 92,5 m (TOT: 149,0 m) (808)	82:08	16:35
92	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (809)	168:00	34:23
93	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (810)	35:51	8:24
94	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (811)	22:06	5:15
95	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (812)	47:12	7:55
96	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (813)	120:36	25:39
97	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (814)	78:12	19:04
98	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (815)	17:52	4:41
99	VESTAS V117-3.3 GridStreame 3300 117.0 !OI! hub: 141,5 m (TOT: 200,0 m) (816)	0:00	0:00

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Calculated:
29-9-2016 21:07/3.0.654

SHADOW - Main Result

Calculation: SS alt 4a - referentiewoningen
Assumptions for shadow calculations

Maximum distance for influence 1. WTG distance circle radius
Minimum sun height over horizon for influence 5 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,24	0,32	0,36	0,44	0,44	0,41	0,43	0,43	0,38	0,35	0,24	0,22

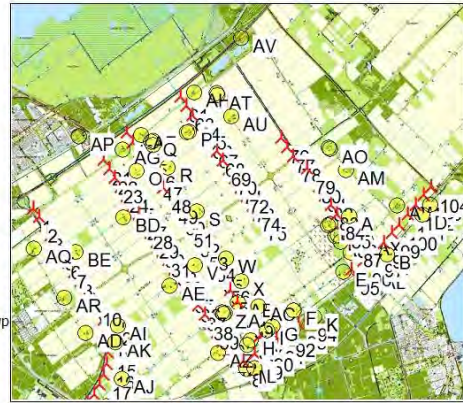
Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
410	492	775	511	375	515	872	1.259	950	781	623	493	8.056

Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: 715027 SS_EMDGrid_0.wp
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in Dutch Stereo-RD/NAP 2000



Scale 1:200.000
New WTG (red triangle icon)
Shadow receptor (yellow circle icon)

WTGs

X (east)	Y (north)	Z [m]	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data Calculation distance [m]	RPM
1	149.503	487.847	-6,0 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
2	149.732	487.519	-6,1 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
3	149.960	487.190	-6,2 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
4	150.189	486.862	-7,0 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
5	150.417	486.534	-4,3 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
6	150.646	486.205	-5,9 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
7	150.874	485.877	-6,0 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
8	151.103	485.549	-6,8 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
9	151.331	485.220	-5,0 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
10	151.826	484.530	-6,0 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
11	152.040	484.192	-5,3 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
12	152.206	483.828	-5,9 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
13	152.320	483.445	-5,9 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
14	152.379	483.049	-5,8 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
15	152.383	482.649	-5,8 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
16	152.331	482.253	-5,0 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
17	152.225	481.867	-5,1 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
18	152.067	481.500	-4,4 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
19	151.859	481.158	-5,1 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
20	151.605	480.848	-4,0 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
21	152.211	489.583	-5,9 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
22	152.438	489.254	-6,2 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
23	152.666	488.925	-5,1 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
24	152.894	488.596	-6,8 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
25	153.122	488.267	-6,9 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
26	153.349	487.939	-6,2 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
27	153.577	487.610	-6,3 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
28	153.805	487.281	-7,6 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
29	154.033	486.952	-6,0 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
30	154.261	486.624	-6,0 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
31	154.489	486.295	-5,5 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
32	154.717	485.966	-6,0 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
33	154.948	485.640	-5,3 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
34	155.179	485.313	-6,7 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
35	155.413	484.989	-6,9 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
36	155.648	484.665	-5,4 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
37	155.883	484.341	-5,1 Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	

To be continued on next page...



Project:
715027 SS

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Calculated:
29-9-2016 21:07/3.0.654

SHADOW - Main Result

Calculation: SS alt 4a - referentiewoningen

...continued from previous page

	X (east)	Y (north)	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.					Calculation distance [m]	RPM
101	163.941	487.636	-5,0	Siemens SWT-3.2-113 2A 32...Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
102	164.244	487.970	-4,7	Siemens SWT-3.2-113 2A 32...Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
103	164.558	488.317	-4,7	Siemens SWT-3.2-113 2A 32...Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
104	164.818	488.603	-4,6	Siemens SWT-3.2-113 2A 32...Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	

Shadow receptor-Input

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
	[m]	[m]	[m]	[m]	[m]	[m]	[°]	[°]	
A	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
C	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
D	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
E	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
F	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
G	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
H	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
I	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
J	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
K	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
L	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
M	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
N	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
O	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
P	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Q	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
R	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
S	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
T	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
U	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
V	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
W	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
X	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Y	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Z	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AA	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AB	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AC	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AD	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AE	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AF	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AG	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AH	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AI	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AJ	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AK	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AL	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AM	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AN	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AO	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AP	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AQ	149.533	486.385	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AR	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AS	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AT	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AU	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AV	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AW	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AX	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AY	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AZ	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BA	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"

To be continued on next page...



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29-9-2016 21:07/3.0.654

SHADOW - Main Result

Calculation: SS alt 4a - referentiewoningen

...continued from previous page

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
BB	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BC	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BD	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BE	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BF	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BG	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BH	161.366	486.618	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

No.	Shadow, worst case			Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]	Shadow hours per year [h/year]
A	225:20	296	1:21	46:47	
B	112:45	160	1:11	25:08	
C	46:26	98	0:50	10:47	
D	50:36	116	0:51	11:48	
E	165:07	118	1:50	41:46	
F	82:27	123	0:58	12:14	
G	174:19	272	1:23	30:35	
H	185:32	282	1:11	37:43	
I	273:47	326	2:12	55:11	
J	183:42	312	1:09	31:47	
K	198:12	177	1:50	43:57	
L	36:26	65	0:46	8:07	
M	0:00	0	0:00	0:00	
N	49:05	131	0:43	10:09	
O	82:16	240	0:50	17:09	
P	45:49	135	0:45	9:35	
Q	71:15	163	0:49	14:35	
R	57:53	151	0:49	12:51	
S	60:19	152	0:48	12:37	
T	54:27	143	0:47	12:09	
U	39:43	133	0:42	8:43	
V	68:49	204	0:51	14:14	
W	73:10	170	0:52	15:49	
X	72:32	171	0:52	15:42	
Y	96:48	257	1:01	19:43	
Z	86:38	221	1:02	18:30	
AA	70:30	164	1:00	14:51	
AB	105:55	108	1:10	14:09	
AC	66:05	179	0:49	13:41	
AD	33:08	139	0:32	6:57	
AE	61:47	158	0:42	14:04	
AF	118:49	169	1:07	25:14	
AG	82:56	199	0:43	16:01	
AH	102:58	147	0:54	18:01	
AI	162:17	255	0:57	33:02	
AJ	35:08	111	0:37	7:51	
AK	285:45	276	1:29	61:48	
AL	12:23	41	0:28	2:50	
AM	11:07	86	0:16	1:56	
AN	6:29	34	0:20	0:58	
AO	5:26	28	0:19	0:53	
AP	3:58	26	0:15	0:29	
AQ	15:48	81	0:27	3:46	
AR	3:42	22	0:15	0:45	
AS	6:21	43	0:16	1:07	
AT	5:54	47	0:15	1:05	
AU	13:27	92	0:17	2:19	
AV	0:00	0	0:00	0:00	
AW	83:41	169	0:57	16:10	

To be continued on next page...

windPRO 3.0.654 by EMD International A/S, Tel. +45 96 35 44 44, www.emd.dk, windpro@emd.dk

30-9-2016 10:54 / 4



Project:
715027 SS

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Calculated:
29-9-2016 21:07/3.0.654

SHADOW - Main Result

Calculation: SS alt 4a - referentiewoningen

...continued from previous page

No.	Shadow, worst case			Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
AX	205:22	295	1:35	41:40
AY	48:31	119	0:50	9:13
AZ	127:17	168	1:08	31:01
BA	138:02	198	1:06	32:59
BB	78:51	154	0:58	17:54
BC	22:23	54	0:38	5:14
BD	53:52	131	0:48	12:25
BE	174:30	290	1:01	33:28
BF	58:13	135	0:50	13:20
BG	81:37	152	0:54	19:38
BH	51:06	104	0:52	11:45

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (818)	0:00	0:00
2	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (819)	0:00	0:00
3	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (820)	0:00	0:00
4	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (821)	9:56	2:14
5	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (822)	36:23	8:28
6	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (823)	47:52	10:39
7	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (824)	96:07	15:07
8	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (825)	0:00	0:00
9	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (826)	0:00	0:00
10	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (827)	3:42	0:45
11	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (828)	0:00	0:00
12	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (829)	69:03	15:33
13	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (830)	63:47	14:14
14	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (831)	249:05	54:29
15	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (832)	99:15	15:53
16	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (833)	0:00	0:00
17	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (834)	22:43	5:13
18	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (835)	9:27	1:58
19	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (836)	2:58	0:36
20	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (837)	22:23	5:14
21	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (838)	18:45	3:33
22	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (839)	35:13	5:40
23	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (840)	10:59	2:15
24	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (841)	20:25	3:11
25	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (842)	0:00	0:00
26	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (843)	0:00	0:00
27	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (844)	38:39	9:39
28	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (845)	11:29	2:08
29	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (846)	3:44	0:39
30	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (847)	0:00	0:00
31	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (848)	0:00	0:00
32	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (849)	5:45	1:20
33	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (850)	12:40	2:39
34	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (851)	50:05	11:07
35	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (852)	24:33	5:15
36	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (853)	13:30	2:41
37	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (854)	16:05	3:29
38	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (855)	31:13	6:56
39	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (856)	66:13	12:15
40	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (857)	11:36	2:01
41	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (858)	14:16	3:19
42	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (859)	154:24	36:52
43	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (860)	56:10	13:05
44	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (861)	125:11	26:29
45	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (862)	110:08	22:16
46	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (863)	43:02	10:25
47	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (864)	54:23	11:19

To be continued on next page...



Project:
715027 SS

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0031742489940
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Calculated:
29-9-2016 21:07/3.0.654

SHADOW - Main Result

Calculation: SS alt 4a - referentiewoningen

...continued from previous page
No. Name

No.	Name	Worst case [h/year]	Expected [h/year]
48	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (865)	3:36	0:37
49	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (866)	5:59	1:22
50	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (867)	16:23	3:52
51	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (868)	37:57	7:14
52	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (869)	0:00	0:00
53	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (870)	8:37	1:58
54	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (871)	28:25	6:55
55	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (872)	68:40	14:13
56	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (873)	23:23	5:19
57	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (874)	49:14	10:03
58	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (875)	19:37	4:41
59	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (876)	160:22	26:35
60	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (877)	115:03	22:49
61	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (878)	36:38	7:49
62	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (879)	183:50	42:24
63	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (880)	70:03	10:46
64	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (881)	6:52	1:08
65	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (882)	7:52	1:55
66	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (883)	40:44	9:00
67	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (884)	21:48	3:39
68	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (885)	4:00	0:39
69	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (886)	0:00	0:00
70	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (887)	0:00	0:00
71	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (888)	0:00	0:00
72	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (889)	0:00	0:00
73	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (890)	0:00	0:00
74	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (891)	0:00	0:00
75	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (892)	0:00	0:00
76	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (893)	0:00	0:00
77	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (894)	0:00	0:00
78	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (895)	0:00	0:00
79	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (896)	10:10	1:36
80	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (897)	1:27	0:18
81	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (898)	2:59	0:37
82	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (899)	6:41	0:59
83	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (900)	22:51	5:05
84	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (901)	68:41	16:07
85	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (902)	194:51	40:31
86	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (903)	190:32	44:36
87	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (904)	151:33	34:16
88	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (905)	66:08	12:31
89	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (906)	160:42	22:48
90	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (907)	71:09	13:22
91	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (908)	155:01	25:03
92	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (909)	50:48	10:10
93	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (910)	94:40	15:41
94	LAGERWEY L100-2.5MW 2520 100.0 !OI hub: 90,0 m (TOT: 140,0 m) (911)	195:13	42:32
95	LAGERWEY L100-2.5MW 2520 100.0 !OI hub: 90,0 m (TOT: 140,0 m) (912)	149:06	37:29
96	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (913)	82:08	16:35
97	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (914)	170:42	33:20
98	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (915)	23:18	5:06
99	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (916)	8:59	2:11
100	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (917)	7:49	1:38
101	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (918)	104:52	20:50
102	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (919)	59:06	14:04
103	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (920)	7:15	1:54
104	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (921)	0:00	0:00

Project:
715027 SS

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Calculated:
29-9-2016 21:29/3.0.654

SHADOW - Main Result

Calculation: SS alt 4b - referentiewoningen
Assumptions for shadow calculations

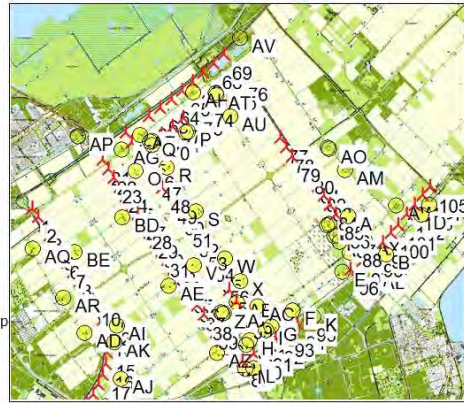
Maximum distance for influence 1. WTG distance circle radius
Minimum sun height over horizon for influence 5 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0,24 0,32 0,36 0,44 0,44 0,41 0,43 0,43 0,38 0,35 0,24 0,22

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
410 492 775 511 375 515 872 1.259 950 781 623 493 8.056
Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: 715027 SS_EMDGrid_0.wp
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in
Dutch Stereo-RD/NAP 2000



WTGs

X (east)	Y (north)	Z [m]	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
				Valid	Manufact.					Calculation distance [m]	RPM
1	149.503	487.847	-6,0 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
2	149.732	487.519	-6,1 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
3	149.960	487.190	-6,2 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
4	150.189	486.862	-7,0 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
5	150.417	486.534	-4,3 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
6	150.646	486.205	-5,9 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
7	150.874	485.877	-6,0 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
8	151.103	485.549	-6,8 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
9	151.331	485.220	-5,0 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
10	151.826	484.530	-6,0 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
11	152.040	484.192	-5,3 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
12	152.206	483.828	-5,9 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
13	152.320	483.445	-5,9 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
14	152.379	483.049	-5,8 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
15	152.383	482.649	-5,8 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
16	152.331	482.253	-5,0 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
17	152.225	481.867	-5,1 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
18	152.067	481.500	-4,4 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
19	151.859	481.158	-5,1 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
20	151.605	480.848	-4,0 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
21	152.211	489.583	-5,9 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
22	152.438	489.254	-6,2 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
23	152.666	488.925	-5,1 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
24	152.894	488.596	-6,8 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
25	153.122	488.267	-6,9 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
26	153.349	487.939	-6,2 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
27	153.577	487.610	-6,3 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
28	153.805	487.281	-7,6 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
29	154.033	486.952	-6,0 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
30	154.261	486.624	-6,0 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
31	154.489	486.295	-5,5 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
32	154.717	485.966	-6,0 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
33	154.948	485.640	-5,3 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
34	155.179	485.313	-6,7 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
35	155.413	484.989	-6,9 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
36	155.648	484.665	-5,4 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	
37	155.883	484.341	-5,1 Siemens SWT-3.2-113 2A 32... Yes	Yes	Siemens	SWT-3.2-113 2A-3.200 3.200	113,0	92,5	1.356	0,0	

To be continued on next page...

Project:
715027 SS

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Calculated:
29-9-2016 21:29/3.0.654

SHADOW - Main Result

Calculation: SS alt 4b - referentiewoningen

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	X (east)	Y (north)	Z [m]	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.					Calculation distance [m]	RPM
101	163.598	487.256	-5,0	Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
102	163.941	487.636	-5,0	Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
103	164.244	487.970	-4,7	Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
104	164.558	488.317	-4,7	Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0
105	164.818	488.603	-4,6	Siemens SWT-3.2-113 2A 32...	Yes	Siemens	SWT-3.2-113 2A-3.200	3.200	113,0	92,5	1.356	0,0

Shadow receptor-Input

No.	X (east)	Y (north)	Z	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction mode
A	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
C	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
D	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
E	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
F	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
G	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
H	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
I	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
J	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
K	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
L	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
M	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
N	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
O	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
P	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Q	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
R	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
S	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
T	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
U	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
V	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
W	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
X	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Y	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Z	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AA	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AB	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AC	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AD	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AE	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AF	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AG	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AH	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AI	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AJ	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AK	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AL	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AM	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AN	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AO	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AP	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AQ	149.533	486.385	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AR	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AS	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AT	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AU	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AV	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AW	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AX	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AY	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AZ	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"

To be continued on next page...



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29-9-2016 21:29/3.0.654

SHADOW - Main Result

Calculation: SS alt 4b - referentiewoningen

...continued from previous page

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
BA	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BB	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BC	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BD	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BE	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BF	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BG	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BH	161.366	486.618	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

No.	Shadow, worst case			Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]	
A	225:20	296	1:21	46:47	
B	112:45	160	1:11	25:08	
C	46:26	98	0:50	10:47	
D	50:36	116	0:51	11:48	
E	165:07	118	1:50	41:46	
F	82:27	123	0:58	12:14	
G	174:19	272	1:23	30:35	
H	185:32	282	1:11	37:43	
I	273:47	326	2:12	55:11	
J	183:42	312	1:09	31:47	
K	198:12	177	1:50	43:57	
L	36:26	65	0:46	8:07	
M	0:00	0	0:00	0:00	
N	75:47	181	0:43	17:06	
O	82:16	240	0:50	17:09	
P	55:46	125	0:47	12:25	
Q	112:47	233	0:49	25:27	
R	57:53	151	0:49	12:51	
S	60:19	152	0:48	12:37	
T	54:27	143	0:47	12:09	
U	76:03	131	0:52	16:57	
V	68:49	204	0:51	14:14	
W	73:10	170	0:52	15:49	
X	72:32	171	0:52	15:42	
Y	96:48	257	1:01	19:43	
Z	86:38	221	1:02	18:30	
AA	70:30	164	1:00	14:51	
AB	105:55	108	1:10	14:09	
AC	66:05	179	0:49	13:41	
AD	33:08	139	0:32	6:57	
AE	61:47	158	0:42	14:04	
AF	135:28	191	1:07	29:09	
AG	82:56	199	0:43	16:01	
AH	143:38	218	1:06	31:10	
AI	162:17	255	0:57	33:02	
AJ	35:08	111	0:37	7:51	
AK	285:45	276	1:29	61:48	
AL	12:23	41	0:28	2:50	
AM	11:07	86	0:16	1:56	
AN	6:29	34	0:20	0:58	
AO	5:26	28	0:19	0:53	
AP	3:58	26	0:15	0:29	
AQ	15:48	81	0:27	3:46	
AR	3:42	22	0:15	0:45	
AS	82:40	190	0:58	17:48	
AT	70:12	173	0:58	15:21	
AU	13:02	61	0:18	2:53	
AV	16:57	52	0:32	2:42	

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windPRO 3.0.654 by EMD International A/S, Tel. +45 96 35 44 44, www.emd.dk, windpro@emd.dk

30-9-2016 10:56 / 4



Project:
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Calculatied:
29-9-2016 21:29/3.0.654

SHADOW - Main Result

Calculation: SS alt 4b - referentiewoningen

...continued from previous page

No.	Shadow, worst case			Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
AW	83:41	169	0:57	16:10
AX	205:22	295	1:35	41:40
AY	48:31	119	0:50	9:13
AZ	127:17	168	1:08	31:01
BA	138:02	198	1:06	32:59
BB	78:51	154	0:58	17:54
BC	22:23	54	0:38	5:14
BD	53:52	131	0:48	12:25
BE	174:30	290	1:01	33:28
BF	58:13	135	0:50	13:20
BG	81:37	152	0:54	19:38
BH	51:06	104	0:52	11:45

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (922)	0:00	0:00
2	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (923)	0:00	0:00
3	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (924)	0:00	0:00
4	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (925)	9:56	2:14
5	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (926)	36:23	8:28
6	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (927)	47:52	10:39
7	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (928)	96:07	15:07
8	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (929)	0:00	0:00
9	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (930)	0:00	0:00
10	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (931)	3:42	0:45
11	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (932)	0:00	0:00
12	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (933)	69:03	15:33
13	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (934)	63:47	14:14
14	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (935)	249:05	54:29
15	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (936)	99:15	15:53
16	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (937)	0:00	0:00
17	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (938)	22:43	5:13
18	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (939)	9:27	1:58
19	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (940)	2:58	0:36
20	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (941)	22:23	5:14
21	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (942)	18:45	3:33
22	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (943)	35:13	5:40
23	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (944)	10:59	2:15
24	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (945)	20:25	3:11
25	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (946)	0:00	0:00
26	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (947)	0:00	0:00
27	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (948)	38:39	9:39
28	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (949)	11:29	2:08
29	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (950)	3:44	0:39
30	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (951)	0:00	0:00
31	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (952)	0:00	0:00
32	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (953)	5:45	1:20
33	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (954)	12:40	2:39
34	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (955)	50:05	11:07
35	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (956)	24:33	5:15
36	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (957)	13:30	2:41
37	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (958)	16:05	3:29
38	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (959)	31:13	6:56
39	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (960)	66:13	12:15
40	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (961)	11:36	2:01
41	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (962)	14:16	3:19
42	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (963)	154:24	36:52
43	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (964)	56:10	13:08
44	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (965)	125:11	26:29
45	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (966)	110:08	22:16
46	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (967)	43:02	10:25

To be continued on next page...



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29-9-2016 21:29/3.0.654

SHADOW - Main Result

Calculation: SS alt 4b - referentiewoningen

...continued from previous page
No. Name

No.	Name	Worst case [h/year]	Expected [h/year]
47	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (968)	54:23	11:19
48	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (969)	3:36	0:37
49	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (970)	5:59	1:22
50	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (971)	16:23	3:52
51	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (972)	37:57	7:14
52	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (973)	0:00	0:00
53	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (974)	8:37	1:58
54	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (975)	28:25	6:55
55	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (976)	68:40	14:13
56	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (977)	23:23	5:19
57	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (978)	49:14	10:03
58	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (979)	19:37	4:41
59	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (980)	160:22	26:35
60	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (981)	115:03	22:49
61	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (982)	183:50	42:24
62	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (983)	0:00	0:00
63	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (984)	0:00	0:00
64	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (985)	10:03	2:06
65	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (986)	97:33	22:49
66	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (987)	23:38	5:22
67	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (988)	0:00	0:00
68	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (989)	0:00	0:00
69	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (990)	16:57	2:42
70	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (991)	64:35	16:05
71	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (992)	100:10	22:41
72	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (993)	0:00	0:00
73	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (994)	12:54	2:28
74	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (995)	140:42	28:09
75	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (996)	9:46	2:31
76	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (997)	1:05	0:16
77	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (998)	0:00	0:00
78	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (999)	0:00	0:00
79	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1000)	0:00	0:00
80	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1001)	10:10	1:36
81	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1002)	1:27	0:18
82	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1003)	2:59	0:37
83	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1004)	6:41	0:59
84	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1005)	22:51	5:05
85	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1006)	68:41	16:07
86	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1007)	194:51	40:31
87	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1008)	190:32	44:36
88	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1009)	151:33	34:16
89	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1010)	66:08	12:31
90	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1011)	160:42	22:48
91	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1012)	71:09	13:22
92	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1013)	155:01	25:03
93	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1014)	50:48	10:10
94	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1015)	94:40	15:41
95	LAGERWEY L100-2.5MW 2520 100.0 !OI hub: 90,0 m (TOT: 140,0 m) (1016)	195:13	42:32
96	LAGERWEY L100-2.5MW 2520 100.0 !OI hub: 90,0 m (TOT: 140,0 m) (1017)	149:06	37:29
97	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1018)	82:08	16:35
98	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1019)	170:42	33:20
99	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1020)	23:18	5:06
100	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1021)	8:59	2:11
101	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1022)	7:49	1:38
102	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1023)	104:52	20:50
103	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1024)	59:06	14:04
104	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1025)	7:15	1:54
105	Siemens SWT-3.2-113 2A 3200 113.0 !OI hub: 92,5 m (TOT: 149,0 m) (1026)	0:00	0:00

Project:
715027 SS

Licensed user:
Pondera Consult B.V.
Welbergweg 49
NL-7556 PE Hengelo
0031742489940
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Calculatied:
29-9-2016 14:01/3.0.654

SHADOW - Main Result

Calculation: SS VKA - referentiewoningen
Assumptions for shadow calculations

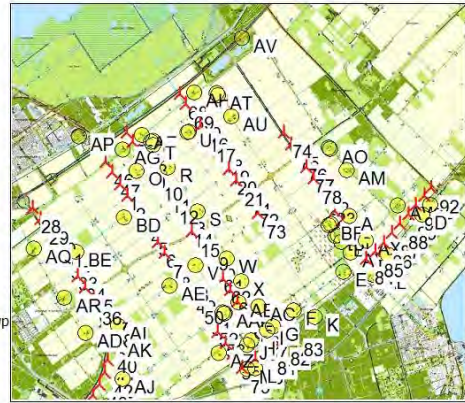
Maximum distance for influence 1. WTG distance circle radius
Minimum sun height over horizon for influence 5 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0,24 0,32 0,36 0,44 0,44 0,41 0,43 0,43 0,38 0,35 0,24 0,22

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
410 492 775 511 375 515 872 1.259 950 781 623 493 8.056
Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: 715027 SS_EMDGrid_0.wp
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in Dutch Stereo-RD/NAP 2000



WTGs

X (east)	Y (north)	Z [m]	Row data/Description	WTG type				Shadow data		
				Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]
1	152.845	488.703	-7,0 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
2	153.132	488.295	-6,6 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
3	153.435	487.873	-6,2 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
4	153.723	487.462	-7,0 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
5	154.006	487.051	-5,1 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
6	154.306	486.623	-6,6 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
7	154.571	486.242	-6,0 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
8	154.876	485.806	-5,6 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
9	153.900	489.437	-6,9 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
10	154.187	489.028	-7,0 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
11	154.489	488.607	-6,9 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
12	154.777	488.194	-6,2 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
13	155.061	487.784	-6,6 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
14	155.361	487.357	-6,7 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
15	155.615	487.006	-6,1 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
16	155.942	490.805	-4,9 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
17	156.212	490.421	-6,8 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
18	156.489	490.028	-5,7 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
19	156.765	489.635	-6,0 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
20	157.041	489.243	-6,0 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
21	157.318	488.849	-6,0 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
22	160.577	488.513	-5,0 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
23	160.847	488.132	-5,7 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
24	161.123	487.739	-4,0 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
25	161.396	487.345	-6,0 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
26	161.675	486.954	-5,0 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
27	161.951	486.561	-5,0 Siemens SWT-3.6-120 3600 120.0 !..Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
28	149.490	487.866	-6,0 Siemens SWT-3.3-130 3300 130.0 !..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
29	149.776	487.456	-6,0 Siemens SWT-3.3-130 3300 130.0 !..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
30	150.061	487.045	-6,4 Siemens SWT-3.3-130 3300 130.0 !..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
31	150.347	486.635	-6,0 Siemens SWT-3.3-130 3300 130.0 !..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
32	150.632	486.225	-5,6 Siemens SWT-3.3-130 3300 130.0 !..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
33	150.918	485.814	-6,0 Siemens SWT-3.3-130 3300 130.0 !..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
34	151.203	485.404	-6,0 Siemens SWT-3.3-130 3300 130.0 !..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
35	151.489	484.993	-5,2 Siemens SWT-3.3-130 3300 130.0 !..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
36	151.817	484.559	-6,0 Siemens SWT-3.3-130 3300 130.0 !..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
37	152.069	484.174	-5,0 Siemens SWT-3.3-130 3300 130.0 !..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
38	152.254	483.753	-5,5 Siemens SWT-3.3-130 3300 130.0 !..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2

To be continued on next page...

Project:
715027 SS

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Calculated:
29-9-2016 14:01/3.0.654

SHADOW - Main Result

Calculation: SS VKA - referentiewoningen

...continued from previous page

	X (east)	Y (north)	Z	Row data/Description	WTG type				Shadow data			
					Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM
39	152.373	483.308	-6,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
40	152.409	482.846	-4,7	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
41	152.367	482.383	-5,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
42	152.247	481.935	-5,7	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
43	152.053	481.518	-4,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
44	151.791	481.135	-3,3	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
45	151.495	480.780	-5,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
46	152.276	489.508	-6,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
47	152.547	489.127	-6,9	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
48	155.165	485.402	-5,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
49	155.464	484.974	-6,1	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
50	155.747	484.584	-6,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
51	156.035	484.187	-6,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
52	156.325	483.792	-5,6	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
53	156.609	483.393	-6,5	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
54	156.897	482.997	-6,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
55	157.184	482.600	-5,3	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
56	153.109	490.563	-6,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
57	153.336	490.229	-6,6	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
58	153.602	489.860	-5,7	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
59	155.939	486.534	-6,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
60	156.231	486.119	-5,8	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
61	156.513	485.718	-5,6	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
62	156.805	485.302	-6,3	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
63	157.088	484.899	-6,8	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
64	157.370	484.498	-5,9	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
65	157.675	484.064	-6,3	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
66	157.938	483.689	-5,4	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
67	158.213	483.301	-5,8	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
68	155.137	491.948	-6,1	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
69	155.387	491.595	-4,8	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
70	155.660	491.206	-5,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
71	157.593	488.458	-5,7	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
72	157.869	488.066	-4,9	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
73	158.148	487.668	-6,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
74	159.143	490.558	-5,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
75	159.439	490.135	-6,3	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
76	159.751	489.692	-3,2	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
77	160.019	489.310	-5,1	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
78	160.295	488.917	-5,1	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
79	157.541	482.103	-6,7	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
80	158.059	482.440	-6,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
81	158.579	482.778	-5,4	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
82	159.082	483.106	-4,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
83	159.587	483.434	1,0	Siemens SWT-3.3-130 3300 130.0 l...Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2	
84	162.318	486.025	-6,0	SENVION MM100 2000 100.0 l...Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9	
85	162.688	486.290	-4,0	SENVION MM100 2000 100.0 l...Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9	
86	163.007	486.607	-4,2	SENVION MM100 2000 100.0 l...Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9	
87	163.321	486.952	-4,6	SENVION MM100 2000 100.0 l...Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9	
88	163.625	487.286	-5,0	SENVION MM100 2000 100.0 l...Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9	
89	163.941	487.636	-5,0	SENVION MM100 2000 100.0 l...Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9	
90	164.244	487.970	-4,7	SENVION MM100 2000 100.0 l...Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9	
91	164.552	488.310	-4,6	SENVION MM100 2000 100.0 l...Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9	
92	164.813	488.597	-4,8	SENVION MM100 2000 100.0 l...Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9	

Shadow receptor-Input

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
	[m]	[m]	[m]	[m]	[m]	[m]	[°]	[°]	
A	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
C	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
D	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"

To be continued on next page...



Project:
715027 SS

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0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
29-9-2016 14:01/3.0.654

SHADOW - Main Result

Calculation: SS VKA - referentiewoningen

...continued from previous page

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[°]	[°]	
E	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
F	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
G	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
H	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
I	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
J	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
K	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
L	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
M	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
N	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
O	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
P	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Q	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
R	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
S	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
T	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
U	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
V	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
W	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
X	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Y	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Z	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AA	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AB	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AC	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AD	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AE	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AF	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AG	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AH	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AI	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AJ	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AK	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AL	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AM	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AN	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AO	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AP	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AQ	149.533	486.385	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AR	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AS	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AT	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AU	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AV	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AW	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AX	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AY	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AZ	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BA	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BB	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BC	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BD	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BE	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BF	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BG	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BH	161.366	486.618	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"

Project:
715027 SS

Licensed user:
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NL-7556 PE Hengelo
0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
29-9-2016 14:01/3.0.654

SHADOW - Main Result

Calculation: SS VKA - referentiewoningen

Calculation Results

Shadow receptor

No.	Shadow, worst case		Max shadow hours per day	Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]	Shadow hours per year [h/year]
A	182:09	236	1:22	39:23	19:17
B	98:52	158	1:02	22:14	19:17
C	43:37	93	0:44	10:12	19:17
D	46:22	97	0:45	10:53	19:17
E	22:37	67	0:27	5:55	19:17
F	0:00	0	0:00	0:00	19:17
G	165:39	292	0:57	28:51	19:17
H	91:32	228	0:43	19:17	19:17
I	247:41	243	1:57	53:53	19:17
J	160:32	279	1:01	27:21	19:17
K	15:54	46	0:34	3:11	19:17
L	77:48	149	1:02	18:13	19:17
M	300:45	144	2:29	68:19	19:17
N	63:02	154	0:49	13:10	19:17
O	80:23	201	0:46	17:34	19:17
P	97:27	162	1:05	23:45	19:17
Q	91:03	188	0:57	18:52	19:17
R	66:57	172	0:53	14:52	19:17
S	65:52	160	0:52	13:49	19:17
T	70:36	164	0:53	15:48	19:17
U	79:33	153	0:57	19:30	19:17
V	80:47	192	0:53	17:36	19:17
W	96:48	204	1:00	21:03	19:17
X	96:23	204	1:00	20:59	19:17
Y	108:14	247	0:59	23:58	19:17
Z	114:03	238	1:11	24:08	19:17
AA	95:48	206	1:06	20:18	19:17
AB	135:46	132	1:23	18:46	19:17
AC	96:59	224	0:55	19:45	19:17
AD	65:45	206	0:36	14:16	19:17
AE	34:13	99	0:44	6:54	19:17
AF	155:17	215	1:16	33:17	19:17
AG	60:49	134	0:55	12:27	19:17
AH	147:35	189	1:06	27:12	19:17
AI	165:07	248	1:04	35:19	19:17
AJ	54:24	145	0:44	12:03	19:17
AK	176:19	177	1:34	36:21	19:17
AL	0:00	0	0:00	0:00	19:17
AM	6:38	54	0:14	1:18	19:17
AN	13:44	74	0:23	2:33	19:17
AO	11:34	67	0:22	2:14	19:17
AP	4:08	28	0:15	0:31	19:17
AQ	27:36	96	0:35	6:40	19:17
AR	45:00	130	0:35	11:22	19:17
AS	11:15	69	0:20	2:04	19:17
AT	9:59	65	0:20	1:55	19:17
AU	7:54	58	0:17	1:30	19:17
AV	0:00	0	0:00	0:00	19:17
AW	73:59	156	0:50	15:01	19:17
AX	216:55	301	1:46	44:10	19:17
AY	35:09	83	0:40	6:57	19:17
AZ	59:57	112	0:58	13:05	19:17
BA	141:09	186	1:10	33:45	19:17
BB	114:43	191	1:07	26:59	19:17
BC	17:33	48	0:35	4:08	19:17
BD	24:09	74	0:38	5:02	19:17
BE	178:32	264	1:07	34:42	19:17
BF	79:45	158	0:58	18:44	19:17
BG	74:47	135	0:57	17:46	19:17
BH	40:03	90	0:50	8:22	19:17

Project:
715027 SS

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Calculated:
29-9-2016 14:01/3.0.654

SHADOW - Main Result

Calculation: SS VKA - referentiewoningen

Total amount of flickering on the shadow receptors caused by each WTG
No. Name

No.	Name	Worst case [h/year]	Expected [h/year]
1	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1027)	18:23	3:25
2	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1028)	0:00	0:00
3	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1029)	0:00	0:00
4	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1030)	19:06	4:09
5	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1031)	5:03	0:53
6	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1032)	0:00	0:00
7	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1033)	3:13	0:43
8	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1034)	11:17	2:35
9	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1035)	46:22	11:19
10	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1036)	58:48	12:13
11	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1037)	4:19	0:50
12	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1038)	7:03	1:36
13	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1039)	17:38	4:10
14	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1040)	41:11	7:52
15	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1041)	0:00	0:00
16	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1042)	77:26	20:10
17	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1043)	28:50	5:33
18	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1044)	6:56	1:13
19	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1045)	0:00	0:00
20	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1046)	0:00	0:00
21	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1047)	0:00	0:00
22	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1048)	3:33	0:38
23	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1049)	2:37	0:33
24	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1050)	67:46	15:03
25	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1051)	213:19	48:35
26	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1052)	199:21	46:39
27	Siemens SWT-3.6-120 3600 120.0 IOL hub: 90,0 m (TOT: 150,0 m) (1053)	152:23	32:02
28	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1054)	0:00	0:00
29	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1055)	0:00	0:00
30	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1056)	0:00	0:00
31	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1057)	56:16	13:20
32	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1058)	59:53	13:36
33	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1059)	89:59	13:41
34	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1060)	0:00	0:00
35	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1061)	37:49	9:54
36	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1062)	5:38	1:12
37	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1063)	1:33	0:16
38	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1064)	124:27	29:06
39	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1065)	82:08	16:32
40	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1066)	160:36	34:14
41	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1067)	40:00	5:36
42	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1068)	38:44	8:42
43	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1069)	12:10	2:34
44	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1070)	3:30	0:43
45	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1071)	17:33	4:08
46	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1072)	28:13	5:22
47	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1073)	12:59	2:39
48	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1074)	30:03	5:58
49	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1075)	25:45	5:27
50	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1076)	20:35	4:20
51	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1077)	33:19	7:43
52	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1078)	75:34	15:38
53	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1079)	36:51	5:55
54	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1080)	24:46	5:41
55	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1081)	112:03	24:23
56	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1082)	72:55	16:58
57	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1083)	136:48	29:24
58	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1084)	148:11	29:40
59	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1085)	13:58	3:10
60	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1086)	37:48	9:13
61	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1087)	90:26	18:53
62	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1088)	31:26	7:15
63	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1089)	65:30	13:29
64	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1090)	26:44	6:24
65	Siemens SWT-3.3-130 3300 130.0 IOL hub: 95,0 m (TOT: 160,0 m) (1091)	200:40	33:58

To be continued on next page...



Project:
715027 SS

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29-9-2016 14:01/3.0.654

SHADOW - Main Result

Calculation: SS VKA - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
66	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1092)	153:21	29:50
67	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1093)	165:13	37:27
68	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1094)	44:21	10:10
69	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1095)	109:12	17:57
70	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1096)	11:16	1:57
71	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1097)	0:00	0:00
72	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1098)	0:00	0:00
73	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1099)	0:00	0:00
74	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1100)	0:00	0:00
75	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1101)	1:44	0:23
76	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1102)	6:40	1:23
77	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1103)	12:40	2:12
78	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1104)	2:27	0:30
79	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1105)	333:09	75:31
80	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1106)	93:53	12:16
81	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1107)	38:40	7:23
82	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1108)	123:00	18:48
83	Siemens SWT-3.3-130 3300 130.0 IO! hub: 95,0 m (TOT: 160,0 m) (1109)	39:54	8:18
84	SENVION MM100 2000 100.0 IO! hub: 110,0 m (TOT: 160,0 m) (1110)	65:58	14:11
85	SENVION MM100 2000 100.0 IO! hub: 110,0 m (TOT: 160,0 m) (1111)	142:40	28:11
86	SENVION MM100 2000 100.0 IO! hub: 110,0 m (TOT: 160,0 m) (1112)	20:20	4:32
87	SENVION MM100 2000 100.0 IO! hub: 110,0 m (TOT: 160,0 m) (1113)	8:19	2:05
88	SENVION MM100 2000 100.0 IO! hub: 110,0 m (TOT: 160,0 m) (1114)	9:35	2:01
89	SENVION MM100 2000 100.0 IO! hub: 110,0 m (TOT: 160,0 m) (1115)	90:16	18:31
90	SENVION MM100 2000 100.0 IO! hub: 110,0 m (TOT: 160,0 m) (1116)	55:22	13:19
91	SENVION MM100 2000 100.0 IO! hub: 110,0 m (TOT: 160,0 m) (1117)	8:45	2:17
92	SENVION MM100 2000 100.0 IO! hub: 110,0 m (TOT: 160,0 m) (1118)	0:00	0:00

Project: **715027 SS**

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Calculated:
29-9-2016 12:43/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - referentiewoningen

Assumptions for shadow calculations

Maximum distance for influence 1. WTG distance circle radius
Minimum sun height over horizon for influence 5 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0,24 0,32 0,36 0,44 0,44 0,41 0,43 0,43 0,38 0,35 0,24 0,22

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
410 492 775 487 456 623 515 872 1.259 950 781 623 493 8.056
Idle start wind speed: Cut in wind speed from power curve

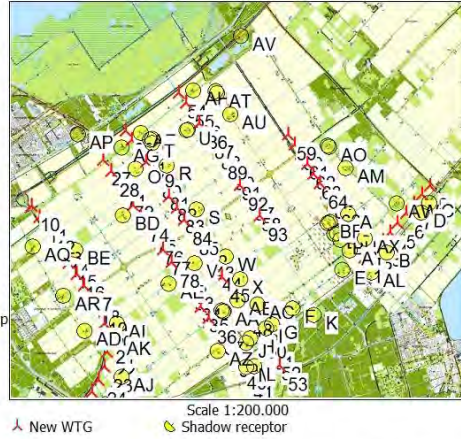
A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: 715027 SS_EMDGrid_0.wp
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in Dutch Stereo-RD/NAP 2000

WTGs

X (east)	Y (north)	Z [m]	Row data/Description	WTG type Valid Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data Calculation distance [m]	RPM	
1	162.302	486.013	-6,0	VESTAS V110-2.0 2000 1...Yes	VESTAS	V110-2.0-2.000	2.000	110,0	105,0	1.320	0,0
2	162.677	486.283	-4,1	VESTAS V110-2.0 2000 1...Yes	VESTAS	V110-2.0-2.000	2.000	110,0	105,0	1.320	0,0
3	163.007	486.607	-4,2	VESTAS V110-2.0 2000 1...Yes	VESTAS	V110-2.0-2.000	2.000	110,0	105,0	1.320	0,0
4	163.283	486.911	-5,0	VESTAS V110-2.0 2000 1...Yes	VESTAS	V110-2.0-2.000	2.000	110,0	105,0	1.320	0,0
5	163.582	487.239	-4,7	VESTAS V110-2.0 2000 1...Yes	VESTAS	V110-2.0-2.000	2.000	110,0	105,0	1.320	0,0
6	163.910	487.602	-5,5	VESTAS V110-2.0 2000 1...Yes	VESTAS	V110-2.0-2.000	2.000	110,0	105,0	1.320	0,0
7	164.212	487.934	-5,0	VESTAS V110-2.0 2000 1...Yes	VESTAS	V110-2.0-2.000	2.000	110,0	105,0	1.320	0,0
8	164.516	488.269	-5,0	VESTAS V110-2.0 2000 1...Yes	VESTAS	V110-2.0-2.000	2.000	110,0	105,0	1.320	0,0
9	164.813	488.597	-4,8	VESTAS V110-2.0 2000 1...Yes	VESTAS	V110-2.0-2.000	2.000	110,0	105,0	1.320	0,0
10	149.490	487.866	-6,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
11	149.775	487.456	-6,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
12	150.061	487.046	-6,4	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
13	150.347	486.635	-6,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
14	150.633	486.225	-5,6	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
15	150.918	485.814	-6,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
16	151.203	485.404	-6,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
17	151.489	484.993	-5,2	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
18	151.810	484.553	-6,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
19	152.083	484.110	-6,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
20	152.278	483.628	-5,1	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
21	152.379	483.118	-5,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
22	152.379	482.599	-4,4	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
23	152.272	482.090	-7,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
24	152.066	481.612	-4,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
25	151.789	481.172	-3,2	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
26	151.478	480.759	-5,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
27	152.250	489.508	-6,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
28	152.536	489.104	-6,8	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
29	153.104	490.559	-6,0	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
30	153.336	490.229	-6,6	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
31	153.598	489.857	-5,7	ENERCON E-141 EP4 420...Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
32	155.151	485.420	-5,0	Acciona Windpower AW13...Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
33	155.434	485.021	-6,9	Acciona Windpower AW13...Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
34	155.718	484.621	-6,0	Acciona Windpower AW13...Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
35	156.001	484.222	-5,8	Acciona Windpower AW13...Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
36	156.284	483.823	-6,0	Acciona Windpower AW13...Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
37	156.567	483.423	-5,8	Acciona Windpower AW13...Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
38	156.851	483.024	-5,9	Acciona Windpower AW13...Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5

To be continued on next page...



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Calculated:
29-9-2016 12:43/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - referentiewoningen

...continued from previous page

X (east)	Y (north)	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
				Valid	Manufact.					Calculation distance [m]	RPM
39	157.134	482.625	-6,0 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
40	157.449	482.181	-6,4 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
41	157.701	481.826	-5,2 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
42	155.938	486.533	-6,0 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
43	156.230	486.119	-5,8 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
44	156.512	485.717	-5,6 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
45	156.805	485.301	-6,3 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
46	157.088	484.899	-6,8 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
47	157.370	484.498	-5,9 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
48	157.676	484.064	-6,3 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
49	157.939	483.690	-5,4 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
50	158.213	483.301	-5,8 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
51	158.505	482.886	-2,0 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
52	158.769	482.512	-5,0 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
53	159.035	482.134	-5,0 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
54	155.156	491.925	-6,1 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
55	155.415	491.556	-4,0 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
56	155.675	491.188	-5,5 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
57	157.753	488.241	-5,0 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
58	158.013	487.873	-5,6 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
59	159.358	490.411	-5,9 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
60	159.603	490.063	-5,9 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
61	159.847	489.715	-5,0 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
62	160.091	489.367	-5,6 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
63	160.335	489.020	-5,0 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
64	160.579	488.672	-5,0 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
65	160.823	488.324	-5,8 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
66	161.067	487.976	-6,6 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
67	161.311	487.629	-5,0 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
68	161.556	487.281	-6,7 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
69	161.800	486.933	-5,8 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
70	162.044	486.585	-5,5 Acciona Windpower AW13..Yes	Acciona	Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
71	152.823	488.700	-6,4 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
72	153.110	488.295	-6,1 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
73	153.397	487.891	-6,0 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
74	153.684	487.487	-6,3 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
75	153.971	487.083	-5,7 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
76	154.258	486.678	-6,4 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
77	154.545	486.274	-6,0 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
78	154.868	485.819	-6,0 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
79	153.896	489.434	-6,8 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
80	154.183	489.026	-7,0 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
81	154.482	488.601	-7,0 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
82	154.771	488.190	-6,4 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
83	155.058	487.783	-6,5 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
84	155.359	487.355	-6,6 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
85	155.608	487.001	-6,0 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
86	155.935	490.820	-4,7 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
87	156.195	490.451	-6,5 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
88	156.454	490.083	-4,6 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
89	156.714	489.715	-6,0 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
90	156.974	489.346	-6,0 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
91	157.234	488.978	-6,0 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
92	157.494	488.609	-5,0 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
93	158.273	487.504	-5,8 Siemens SWT-3.6-120 36...Yes	Siemens		SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0

Shadow receptor-Input

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
	[m]	[m]	[m]	[m]	[m]	[m]	[°]	[°]	
A	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
C	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"

To be continued on next page...



Project:
715027 SS

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Calculated:
29-9-2016 12:43/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - referentiewoningen

...continued from previous page

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
D	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
E	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
F	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
G	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
H	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
I	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
J	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
K	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
L	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
M	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
N	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
O	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
P	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Q	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
R	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
S	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
T	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
U	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
V	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
W	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
X	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Y	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Z	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AA	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AB	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AC	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AD	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AE	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AF	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AG	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AH	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AI	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AJ	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AK	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AL	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AM	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AN	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AO	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AP	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AQ	149.533	486.385	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AR	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AS	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AT	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AU	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AV	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AW	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AX	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AY	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AZ	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BA	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BB	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BC	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BD	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BE	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BF	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BG	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BH	161.366	486.618	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"



Project:
715027 SS

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Calculated:
29-9-2016 12:43/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - referentiewoningen

Calculation Results

Shadow receptor

No.	Shadow, worst case		Max shadow hours per day	Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]	Shadow hours per year [h/year]
A	424:23	296	2:04	84:51	21:11
B	109:55	168	1:15	24:58	21:11
C	42:23	93	0:45	9:40	21:11
D	45:05	95	0:47	10:23	21:11
E	25:05	70	0:29	6:34	21:11
F	0:00	0	0:00	0:00	21:11
G	74:54	183	0:54	16:27	21:11
H	100:45	220	0:52	21:11	21:11
I	238:11	270	1:32	51:09	21:11
J	84:23	196	1:08	18:11	21:11
K	0:00	0	0:00	0:00	21:11
L	185:24	262	1:14	41:26	21:11
M	495:15	297	2:15	96:18	21:11
N	98:17	182	0:51	21:47	21:11
O	97:26	224	0:55	21:34	21:11
P	87:43	161	1:01	21:06	21:11
Q	130:36	214	0:58	29:10	21:11
R	84:59	191	0:52	18:54	21:11
S	64:53	159	0:51	13:36	21:11
T	120:00	217	0:56	27:23	21:11
U	71:09	152	0:52	17:13	21:11
V	80:16	191	0:58	17:38	21:11
W	97:47	203	1:01	21:14	21:11
X	97:36	206	1:01	21:14	21:11
Y	108:53	268	1:07	23:43	21:11
Z	122:59	267	1:13	25:04	21:11
AA	105:15	240	1:10	21:26	21:11
AB	139:14	138	1:28	19:16	21:11
AC	98:35	227	0:56	20:05	21:11
AD	105:45	203	0:45	23:15	21:11
AE	40:08	109	0:46	8:29	21:11
AF	248:16	299	1:17	52:04	21:11
AG	114:48	186	1:02	22:53	21:11
AH	148:37	177	1:06	26:45	21:11
AI	168:12	227	1:08	36:31	21:11
AJ	61:43	136	0:39	13:38	21:11
AK	206:37	222	1:31	41:41	21:11
AL	0:00	0	0:00	0:00	21:11
AM	25:13	123	0:24	4:25	21:11
AN	20:53	101	0:27	3:59	21:11
AO	18:03	92	0:26	3:32	21:11
AP	13:27	46	0:27	1:43	21:11
AQ	64:46	154	0:42	15:24	21:11
AR	67:03	143	0:43	16:26	21:11
AS	12:03	71	0:20	2:12	21:11
AT	10:37	66	0:20	2:00	21:11
AU	7:52	59	0:17	1:32	21:11
AV	0:00	0	0:00	0:00	21:11
AW	96:52	181	0:56	18:05	21:11
AX	352:56	345	2:25	74:12	21:11
AY	44:21	114	0:44	8:52	21:11
AZ	84:20	154	1:05	18:39	21:11
BA	74:46	132	0:59	17:30	21:11
BB	58:33	133	0:54	12:52	21:11
BC	29:19	56	0:41	7:00	21:11
BD	28:52	80	0:41	6:12	21:11
BE	243:12	302	1:08	49:45	21:11
BF	44:32	119	0:46	9:59	21:11
BG	49:21	108	0:49	11:29	21:11
BH	46:10	130	0:46	10:18	21:11

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Calculated:
29-9-2016 12:43/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - referentiewoningen

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1415)	74:09	15:49
2	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1416)	167:07	31:59
3	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1417)	26:05	5:58
4	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1418)	10:03	2:34
5	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1419)	8:44	1:50
6	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1420)	105:49	19:51
7	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1421)	59:19	13:50
8	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1422)	10:28	2:43
9	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1423)	0:00	0:00
10	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1424)	0:00	0:00
11	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1425)	0:00	0:00
12	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1426)	0:10	0:02
13	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1427)	97:34	23:19
14	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1428)	85:36	20:07
15	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1429)	122:54	20:32
16	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1430)	1:44	0:14
17	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1431)	47:29	12:24
18	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1432)	13:48	3:01
19	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1433)	5:46	1:03
20	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1434)	161:06	40:06
21	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1435)	194:37	38:37
22	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1436)	112:01	19:29
23	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1437)	39:45	7:48
24	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1438)	24:43	5:30
25	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1439)	10:05	2:06
26	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1440)	29:19	7:00
27	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1441)	55:18	10:36
28	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1442)	52:31	9:17
29	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1443)	144:14	33:21
30	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1444)	170:43	39:12
31	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1445)	257:09	51:05
32	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1446)	29:18	5:55
33	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1447)	30:08	6:46
34	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1448)	20:53	4:21
35	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1449)	30:33	6:58
36	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1450)	66:10	13:58
37	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1451)	58:48	9:02
38	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1452)	21:25	4:54
39	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1453)	123:06	27:53
40	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1454)	201:25	44:54
41	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1455)	423:42	75:54
42	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1456)	13:51	3:09
43	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1457)	38:40	9:27
44	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1458)	91:35	19:06
45	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1459)	31:47	7:20
46	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1460)	66:38	13:43
47	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1461)	27:19	6:32
48	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1462)	203:44	34:31
49	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1463)	155:13	30:10
50	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1464)	169:36	38:53
51	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1465)	90:30	16:14
52	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1466)	50:19	11:20
53	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1467)	13:38	2:51
54	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1468)	47:43	10:44
55	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1469)	107:51	17:06
56	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1470)	11:40	1:59
57	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1471)	0:00	0:00
58	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1472)	0:00	0:00
59	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1473)	0:37	0:08
60	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1474)	4:00	0:54
61	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1475)	9:18	1:56
62	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1476)	17:13	3:03
63	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1477)	4:04	0:48
64	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1478)	6:01	1:15
65	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1479)	15:01	2:13

To be continued on next page...



Project:
715027 SS

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Calculated:
29-9-2016 12:43/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
66	Acciona Windpower AW132/3000 3000 132.0 !OI hub: 94,0 m (TOT: 160,0 m) (1480)	9:52	2:11
67	Acciona Windpower AW132/3000 3000 132.0 !OI hub: 94,0 m (TOT: 160,0 m) (1481)	173:05	39:46
68	Acciona Windpower AW132/3000 3000 132.0 !OI hub: 94,0 m (TOT: 160,0 m) (1482)	281:28	51:25
69	Acciona Windpower AW132/3000 3000 132.0 !OI hub: 94,0 m (TOT: 160,0 m) (1483)	160:06	36:18
70	Acciona Windpower AW132/3000 3000 132.0 !OI hub: 94,0 m (TOT: 160,0 m) (1484)	247:39	55:32
71	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1485)	16:59	3:11
72	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1486)	0:00	0:00
73	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1487)	0:00	0:00
74	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1488)	22:56	5:09
75	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1489)	5:56	1:03
76	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1490)	0:00	0:00
77	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1491)	2:45	0:37
78	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1492)	10:58	2:32
79	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1493)	46:47	11:26
80	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1494)	58:04	12:03
81	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1495)	4:22	0:51
82	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1496)	6:41	1:31
83	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1497)	17:24	4:07
84	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1498)	40:48	7:47
85	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1499)	0:00	0:00
86	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1500)	63:45	16:38
87	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1501)	30:55	6:06
88	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1502)	8:37	1:31
89	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1503)	0:00	0:00
90	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1504)	0:00	0:00
91	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1505)	0:00	0:00
92	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1506)	0:00	0:00
93	Siemens SWT-3.6-120 3600 120.0 !OI hub: 90,0 m (TOT: 150,0 m) (1507)	0:00	0:00

Project:
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Calculated:
29-9-2016 13:38/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - referentiewoningen
Assumptions for shadow calculations

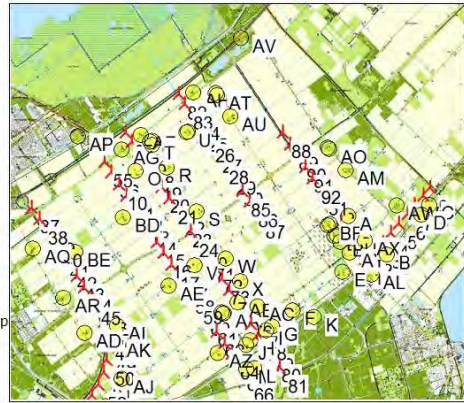
Maximum distance for influence 1. WTG distance circle radius
Minimum sun height over horizon for influence 5 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0,24 0,32 0,36 0,44 0,44 0,41 0,43 0,43 0,38 0,35 0,24 0,22

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
410 492 775 511 375 515 872 1.259 950 781 623 493 8.056
Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: 715027 SS_EMDGrid_0.wp
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in Dutch Stereo-RD/NAP 2000



WTGs

X (east)	Y (north)	Z [m]	Row data/Description	WTG type			Shadow data				
				Valid	Manufact.	Type-generator	Power, [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM
1	162.318	486.025	-6,0 SENVION MM100 2000 100.0 IOI h...Yes	Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9
2	162.688	486.290	-4,0 SENVION MM100 2000 100.0 IOI h...Yes	Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9
3	163.007	486.607	-4,2 SENVION MM100 2000 100.0 IOI h...Yes	Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9
4	163.321	486.952	-4,6 SENVION MM100 2000 100.0 IOI h...Yes	Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9
5	163.625	487.286	-5,0 SENVION MM100 2000 100.0 IOI h...Yes	Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9
6	163.941	487.636	-5,0 SENVION MM100 2000 100.0 IOI h...Yes	Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9
7	164.244	487.970	-4,7 SENVION MM100 2000 100.0 IOI h...Yes	Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9
8	164.552	488.310	-4,6 SENVION MM100 2000 100.0 IOI h...Yes	Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9
9	164.813	488.597	-4,8 SENVION MM100 2000 100.0 IOI h...Yes	Yes	SENVION	MM100-2.000	2.000	100,0	110,0	1.200	13,9
10	152.845	488.703	-7,0 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
11	153.132	488.295	-6,6 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
12	153.435	487.873	-6,2 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
13	153.723	487.462	-7,0 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
14	154.006	487.051	-5,1 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
15	154.306	486.623	-6,6 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
16	154.571	486.242	-6,0 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
17	154.876	485.806	-5,6 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
18	153.900	489.437	-6,9 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
19	154.187	489.028	-7,0 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
20	154.489	488.607	-6,9 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
21	154.777	488.194	-6,2 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
22	155.061	487.784	-6,6 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
23	155.361	487.357	-6,7 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
24	155.615	487.006	-6,1 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
25	155.942	490.805	-4,9 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
26	156.212	490.421	-6,8 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
27	156.489	490.028	-5,7 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
28	156.765	489.635	-6,0 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
29	157.041	489.243	-6,0 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
30	157.318	488.849	-6,0 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
31	160.577	488.513	-5,0 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
32	160.847	488.132	-5,7 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
33	161.123	487.739	-4,0 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
34	161.396	487.345	-6,0 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
35	161.675	486.954	-5,0 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
36	161.951	486.561	-5,0 Siemens SWT-3.6-120 3600 120.0 l...Yes	Yes	Siemens	SWT-3.6-120-3.600 3.600	120,0	90,0	1.440	14,0	
37	149.490	487.866	-6,0 Siemens SWT-3.3-130 3300 130.0 l...Yes	Yes	Siemens	SWT-3.3-130-3.300 3.300	130,0	95,0	1.560	12,2	
38	149.776	487.456	-6,0 Siemens SWT-3.3-130 3300 130.0 l...Yes	Yes	Siemens	SWT-3.3-130-3.300 3.300	130,0	95,0	1.560	12,2	

To be continued on next page...



Project: 715027 SS

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SHADOW - Main Result

Calculation: SS VKA terugvaloptie - referentiewoningen

...continued from previous page

Table with columns: No., X (east), Y (north), Z, Width [m], Height [m], Height a.g.l. [m], Degrees from south cw [°], Slope of window [°], Direction mode. It lists 40 rows of data for various points (E to BH) with consistent values for most parameters.



Project:
715027 SS

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Calculated:
29-9-2016 13:38/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - referentiewoningen

Calculation Results

Shadow receptor

No.	Shadow, worst case		Max shadow hours per day	Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]	Shadow hours per year [h/year]
A	182:09	236	1:22	39:23	39:23
B	98:52	158	1:02	22:14	22:14
C	43:37	93	0:44	10:12	10:12
D	46:22	97	0:45	10:53	10:53
E	22:37	67	0:27	5:55	5:55
F	0:00	0	0:00	0:00	0:00
G	76:17	187	0:53	16:34	16:34
H	102:52	211	1:01	21:22	21:22
I	236:57	270	1:31	50:44	50:44
J	97:24	193	1:05	20:46	20:46
K	0:00	0	0:00	0:00	0:00
L	199:45	281	1:16	43:59	43:59
M	452:30	277	2:15	86:03	86:03
N	63:02	154	0:49	13:10	13:10
O	80:23	201	0:46	17:34	17:34
P	97:27	162	1:05	23:45	23:45
Q	91:03	188	0:57	18:52	18:52
R	66:57	172	0:53	14:52	14:52
S	65:52	160	0:52	13:49	13:49
T	70:36	164	0:53	15:48	15:48
U	79:33	153	0:57	19:30	19:30
V	80:47	192	0:53	17:36	17:36
W	96:48	204	1:00	21:03	21:03
X	96:23	204	1:00	20:59	20:59
Y	108:14	247	0:59	23:58	23:58
Z	114:03	238	1:11	24:08	24:08
AA	95:48	206	1:06	20:18	20:18
AB	135:46	132	1:23	18:46	18:46
AC	96:59	224	0:55	19:45	19:45
AD	65:45	206	0:36	14:16	14:16
AE	34:13	99	0:44	6:54	6:54
AF	155:17	215	1:16	33:17	33:17
AG	60:49	134	0:55	12:27	12:27
AH	147:35	189	1:06	27:12	27:12
AI	165:07	248	1:04	35:19	35:19
AJ	54:24	145	0:44	12:03	12:03
AK	176:19	177	1:34	36:21	36:21
AL	0:00	0	0:00	0:00	0:00
AM	6:38	54	0:14	1:18	1:18
AN	13:44	74	0:23	2:33	2:33
AO	11:34	67	0:22	2:14	2:14
AP	4:08	28	0:15	0:31	0:31
AQ	27:36	96	0:35	6:40	6:40
AR	45:00	130	0:35	11:22	11:22
AS	11:15	69	0:20	2:04	2:04
AT	9:59	65	0:20	1:55	1:55
AU	7:54	58	0:17	1:30	1:30
AV	0:00	0	0:00	0:00	0:00
AW	73:59	156	0:50	15:01	15:01
AX	216:55	301	1:46	44:10	44:10
AY	35:09	83	0:40	6:57	6:57
AZ	67:11	138	0:58	14:16	14:16
BA	141:09	186	1:10	33:45	33:45
BB	114:43	191	1:07	26:59	26:59
BC	17:33	48	0:35	4:08	4:08
BD	24:09	74	0:38	5:02	5:02
BE	178:32	264	1:07	34:42	34:42
BF	79:45	158	0:58	18:44	18:44
BG	74:47	135	0:57	17:46	17:46
BH	40:03	90	0:50	8:22	8:22

Project:
715027 SS

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Calculated:
29-9-2016 13:38/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - referentiewoningen

Total amount of flickering on the shadow receptors caused by each WTG
No. Name

Worst case
[h/year]

Expected
[h/year]

1	SENVION MM100 2000 100.0 IOI hub: 110,0 m (TOT: 160,0 m) (1211)	65:58	14:11
2	SENVION MM100 2000 100.0 IOI hub: 110,0 m (TOT: 160,0 m) (1212)	142:40	28:11
3	SENVION MM100 2000 100.0 IOI hub: 110,0 m (TOT: 160,0 m) (1213)	20:20	4:32
4	SENVION MM100 2000 100.0 IOI hub: 110,0 m (TOT: 160,0 m) (1214)	8:19	2:05
5	SENVION MM100 2000 100.0 IOI hub: 110,0 m (TOT: 160,0 m) (1215)	9:35	2:01
6	SENVION MM100 2000 100.0 IOI hub: 110,0 m (TOT: 160,0 m) (1216)	90:16	18:31
7	SENVION MM100 2000 100.0 IOI hub: 110,0 m (TOT: 160,0 m) (1217)	55:22	13:19
8	SENVION MM100 2000 100.0 IOI hub: 110,0 m (TOT: 160,0 m) (1218)	8:45	2:17
9	SENVION MM100 2000 100.0 IOI hub: 110,0 m (TOT: 160,0 m) (1219)	0:00	0:00
10	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1220)	18:23	3:25
11	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1221)	0:00	0:00
12	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1222)	0:00	0:00
13	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1223)	19:06	4:09
14	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1224)	5:03	0:53
15	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1225)	0:00	0:00
16	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1226)	3:13	0:43
17	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1227)	11:17	2:35
18	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1228)	46:22	11:19
19	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1229)	58:48	12:13
20	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1230)	4:19	0:50
21	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1231)	7:03	1:36
22	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1232)	17:38	4:10
23	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1233)	41:11	7:52
24	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1234)	0:00	0:00
25	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1235)	77:26	20:10
26	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1236)	28:50	5:33
27	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1237)	6:56	1:13
28	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1238)	0:00	0:00
29	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1239)	0:00	0:00
30	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1240)	0:00	0:00
31	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1241)	3:33	0:38
32	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1242)	2:37	0:33
33	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1243)	67:46	15:03
34	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1244)	213:19	48:35
35	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1245)	199:21	46:39
36	Siemens SWT-3.6-120 3600 120.0 IOI hub: 90,0 m (TOT: 150,0 m) (1246)	152:23	32:02
37	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1247)	0:00	0:00
38	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1248)	0:00	0:00
39	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1249)	0:00	0:00
40	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1250)	56:16	13:20
41	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1251)	59:53	13:36
42	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1252)	89:59	13:41
43	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1253)	0:00	0:00
44	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1254)	37:49	9:54
45	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1255)	5:38	1:12
46	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1256)	1:33	0:16
47	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1257)	124:27	29:06
48	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1258)	82:08	16:32
49	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1259)	160:36	34:14
50	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1260)	40:00	5:36
51	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1261)	38:44	8:42
52	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1262)	12:10	2:34
53	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1263)	3:30	0:43
54	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1264)	17:33	4:08
55	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1265)	28:13	5:22
56	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1266)	12:59	2:39
57	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1267)	30:03	5:58
58	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1268)	25:45	5:27
59	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1269)	20:35	4:20
60	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1270)	33:19	7:43
61	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1271)	75:34	15:38
62	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1272)	36:51	5:55
63	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1273)	24:46	5:38
64	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1274)	112:03	24:31
65	Siemens SWT-3.3-130 3300 130.0 IOI hub: 95,0 m (TOT: 160,0 m) (1275)	175:21	38:45

To be continued on next page...

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715027 SS

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Calculated:
29-9-2016 13:38/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - referentiewoningen

...continued from previous page
No. Name

						Worst case	Expected
						[h/year]	[h/year]
66	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1276)		432:28	76:55
67	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1277)		72:55	16:58
68	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1278)		136:48	29:24
69	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1279)		148:11	29:40
70	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1280)		13:58	3:10
71	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1281)		37:48	9:13
72	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1282)		90:26	18:53
73	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1283)		31:26	7:15
74	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1284)		65:30	13:29
75	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1285)		26:44	6:24
76	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1286)		200:40	33:58
77	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1287)		153:21	29:50
78	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1288)		165:13	37:51
79	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1289)		95:58	17:07
80	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1290)		49:57	11:20
81	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1291)		13:29	2:51
82	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1292)		44:21	10:10
83	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1293)		109:12	17:57
84	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1294)		11:16	1:57
85	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1295)		0:00	0:00
86	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1296)		0:00	0:00
87	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1297)		0:00	0:00
88	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1298)		0:00	0:00
89	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1299)		1:44	0:23
90	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1300)		6:40	1:23
91	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1301)		12:40	2:12
92	Siemens SWT-3.3-130	3300	130.0	IOI hub: 95,0 m (TOT: 160,0 m) (1302)		2:27	0:30

Project:
715027 SS

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Calculated:
29-9-2016 16:21/3.0.654

SHADOW - Main Result

Calculation: SS Bestaand en blijft - referentiewoningen
Assumptions for shadow calculations

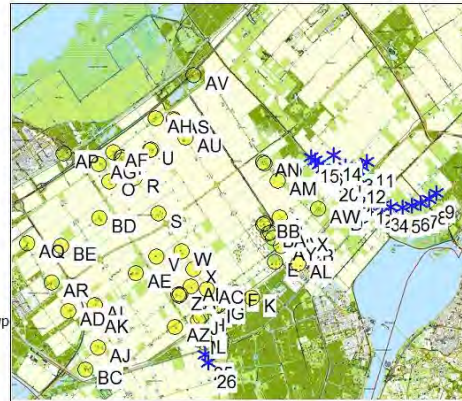
Maximum distance for influence 1. WTG distance circle radius
Minimum sun height over horizon for influence 5 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0,24 0,32 0,36 0,44 0,44 0,41 0,43 0,43 0,38 0,35 0,24 0,22

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
410 492 775 511 375 515 872 1.259 950 781 623 493 8.056
Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: 715027 SS_EMDGrid_0.wp
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in Dutch Stereo-RD/NAP 2000



WTGs

X (east)	Y (north)	Z [m]	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
				Valid	Manufact.	Type-generator				Calculation distance [m]	RPM
1	165.852	488.427	0,0 ENERCON E-82 E3 3000 82.0 I...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
2	166.220	488.239	0,0 ENERCON E-82 E3 3000 82.0 I...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
3	166.602	488.106	0,0 ENERCON E-82 E3 3000 82.0 I...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
4	167.004	488.029	0,0 ENERCON E-82 E3 3000 82.0 I...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
5	167.589	488.020	0,0 ENERCON E-82 E3 3000 82.0 I...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
6	168.032	488.088	0,0 ENERCON E-82 E3 3000 82.0 I...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
7	168.453	488.222	0,0 ENERCON E-82 E3 3000 82.0 I...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
8	168.855	488.412	0,0 ENERCON E-82 E3 3000 82.0 I...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
9	169.215	488.669	0,0 ENERCON E-82 E3 3000 82.0 I...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
10	165.652	489.851	0,0 ENERCON E-70 E4 2000 71.0 I...No	ENERCON	E-70 E4-2.000	2.000	71,0	70,0	852	20,0	
11	165.874	490.077	0,0 ENERCON E-70 E4 2000 71.0 I...No	ENERCON	E-70 E4-2.000	2.000	71,0	70,0	852	20,0	
12	165.402	489.335	0,0 NEG MICON NM52/900 900-20...No	NEG MICON	NM52/900-900/200	900	52,0	55,0	624	22,4	
13	164.828	489.846	0,0 NEG MICON NM52/900 900-20...No	NEG MICON	NM52/900-900/200	900	52,0	55,0	624	22,4	
14	164.265	490.359	0,0 NEG MICON NM52/900 900-20...No	NEG MICON	NM52/900-900/200	900	52,0	55,0	624	22,4	
15	163.188	490.274	0,0 NEG MICON NM1000/54 1000...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
16	163.372	490.106	0,0 NEG MICON NM1000/54 1000...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
17	163.559	489.940	0,0 NEG MICON NM1000/54 1000...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
18	163.743	489.772	0,0 NEG MICON NM1000/54 1000...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
19	163.932	489.606	0,0 NEG MICON NM1000/54 1000...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
20	164.118	489.439	0,0 NEG MICON NM1000/54 1000...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
21	164.303	489.272	0,0 NEG MICON NM1000/54 1000...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
22	164.491	489.105	0,0 NEG MICON NM1000/54 1000...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
23	164.675	488.938	0,0 NEG MICON NM1000/54 1000...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
24	164.862	488.772	0,0 NEG MICON NM1000/54 1000...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
25	158.078	481.403	0,0 REpower 3.4M104 3400 104.0 .No	REpower	3.4M104-3.400	3.400	104,0	98,0	1.248	13,8	
26	158.240	481.027	0,0 REpower 3.4M104 3400 104.0 .No	REpower	3.4M104-3.400	3.400	104,0	98,0	1.248	13,8	

Shadow receptor-Input

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
	[m]	[m]	[m]	[m]	[m]	[m]	[°]	[°]	
A	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
C	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
D	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
E	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"

To be continued on next page...



Project:
715027 SS

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0031742489940
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Calculated:
29-9-2016 16:21/3.0.654

SHADOW - Main Result

Calculation: SS Bestaan en blijft - referentiewoningen

...continued from previous page

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
	[m]	[m]	[m]	[m]	[m]	[m]	[°]	[°]	
F	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
G	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
H	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
I	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
J	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
K	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
L	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
M	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
N	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
O	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
P	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Q	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
R	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
S	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
T	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
U	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
V	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
W	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
X	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Y	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Z	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AA	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AB	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AC	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AD	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AE	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AF	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AG	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AH	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AI	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AJ	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AK	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AL	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AM	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AN	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AO	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AP	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AQ	149.533	486.385	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AR	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AS	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AT	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AU	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AV	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AW	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AX	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AY	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AZ	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BA	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BB	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BC	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BD	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BE	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BF	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BG	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BH	161.366	486.618	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"



Project:
715027 SS

Licensed user:
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0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
29-9-2016 16:21/3.0.654

SHADOW - Main Result

Calculation: SS Bestaand en blijft - referentiewoningen

Calculation Results

Shadow receptor

No.	Shadow, worst case		Max shadow hours per day	Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]
A	0:00	0	0:00	0:00
B	0:00	0	0:00	0:00
C	0:00	0	0:00	0:00
D	0:00	0	0:00	0:00
E	0:00	0	0:00	0:00
F	0:00	0	0:00	0:00
G	0:00	0	0:00	0:00
H	0:00	0	0:00	0:00
I	0:00	0	0:00	0:00
J	0:00	0	0:00	0:00
K	0:00	0	0:00	0:00
L	0:00	0	0:00	0:00
M	18:58	44	0:32	2:24
N	0:00	0	0:00	0:00
O	0:00	0	0:00	0:00
P	0:00	0	0:00	0:00
Q	0:00	0	0:00	0:00
R	0:00	0	0:00	0:00
S	0:00	0	0:00	0:00
T	0:00	0	0:00	0:00
U	0:00	0	0:00	0:00
V	0:00	0	0:00	0:00
W	0:00	0	0:00	0:00
X	0:00	0	0:00	0:00
Y	0:00	0	0:00	0:00
Z	0:00	0	0:00	0:00
AA	0:00	0	0:00	0:00
AB	0:00	0	0:00	0:00
AC	0:00	0	0:00	0:00
AD	0:00	0	0:00	0:00
AE	0:00	0	0:00	0:00
AF	0:00	0	0:00	0:00
AG	0:00	0	0:00	0:00
AH	0:00	0	0:00	0:00
AI	0:00	0	0:00	0:00
AJ	0:00	0	0:00	0:00
AK	0:00	0	0:00	0:00
AL	0:00	0	0:00	0:00
AM	0:00	0	0:00	0:00
AN	0:00	0	0:00	0:00
AO	0:00	0	0:00	0:00
AP	0:00	0	0:00	0:00
AQ	0:00	0	0:00	0:00
AR	0:00	0	0:00	0:00
AS	0:00	0	0:00	0:00
AT	0:00	0	0:00	0:00
AU	0:00	0	0:00	0:00
AV	0:00	0	0:00	0:00
AW	0:00	0	0:00	0:00
AX	0:00	0	0:00	0:00
AY	0:00	0	0:00	0:00
AZ	0:00	0	0:00	0:00
BA	0:00	0	0:00	0:00
BB	0:00	0	0:00	0:00
BC	0:00	0	0:00	0:00
BD	0:00	0	0:00	0:00
BE	0:00	0	0:00	0:00
BF	0:00	0	0:00	0:00
BG	0:00	0	0:00	0:00
BH	0:00	0	0:00	0:00



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SHADOW - Main Result

Calculation: SS Bestaand en blijft - referentiewoningen

Total amount of flickering on the shadow receptors caused by each WTG
No. Name

No.	Name	Worst case [h/year]	Expected [h/year]
1	ENERCON E-82 E3 3000 82.0 IO! hub: 108,4 m (TOT: 149,4 m) (218)	0:00	0:00
2	ENERCON E-82 E3 3000 82.0 IO! hub: 108,4 m (TOT: 149,4 m) (219)	0:00	0:00
3	ENERCON E-82 E3 3000 82.0 IO! hub: 108,4 m (TOT: 149,4 m) (220)	0:00	0:00
4	ENERCON E-82 E3 3000 82.0 IO! hub: 108,4 m (TOT: 149,4 m) (221)	0:00	0:00
5	ENERCON E-82 E3 3000 82.0 IO! hub: 108,4 m (TOT: 149,4 m) (222)	0:00	0:00
6	ENERCON E-82 E3 3000 82.0 IO! hub: 108,4 m (TOT: 149,4 m) (223)	0:00	0:00
7	ENERCON E-82 E3 3000 82.0 IO! hub: 108,4 m (TOT: 149,4 m) (224)	0:00	0:00
8	ENERCON E-82 E3 3000 82.0 IO! hub: 108,4 m (TOT: 149,4 m) (225)	0:00	0:00
9	ENERCON E-82 E3 3000 82.0 IO! hub: 108,4 m (TOT: 149,4 m) (226)	0:00	0:00
10	ENERCON E-70 E4 2000 71.0 IO! hub: 70,0 m (TOT: 105,5 m) (227)	0:00	0:00
11	ENERCON E-70 E4 2000 71.0 IO! hub: 70,0 m (TOT: 105,5 m) (228)	0:00	0:00
12	NEG MICON NM52/900 900-200 52.0 IO! hub: 55,0 m (TOT: 81,0 m) (229)	0:00	0:00
13	NEG MICON NM52/900 900-200 52.0 IO! hub: 55,0 m (TOT: 81,0 m) (230)	0:00	0:00
14	NEG MICON NM52/900 900-200 52.0 IO! hub: 55,0 m (TOT: 81,0 m) (231)	0:00	0:00
15	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (232)	0:00	0:00
16	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (233)	0:00	0:00
17	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (234)	0:00	0:00
18	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (235)	0:00	0:00
19	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (236)	0:00	0:00
20	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (237)	0:00	0:00
21	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (238)	0:00	0:00
22	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (239)	0:00	0:00
23	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (240)	0:00	0:00
24	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (241)	0:00	0:00
25	REpower 3.4M104 3400 104.0 IO! hub: 98,0 m (TOT: 150,0 m) (242)	18:58	2:24
26	REpower 3.4M104 3400 104.0 IO! hub: 98,0 m (TOT: 150,0 m) (243)	0:00	0:00

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29-9-2016 16:41/3.0.654

SHADOW - Main Result

Calculation: SS Bestaand totaal dubbeldraai - referentiewoningen

Assumptions for shadow calculations

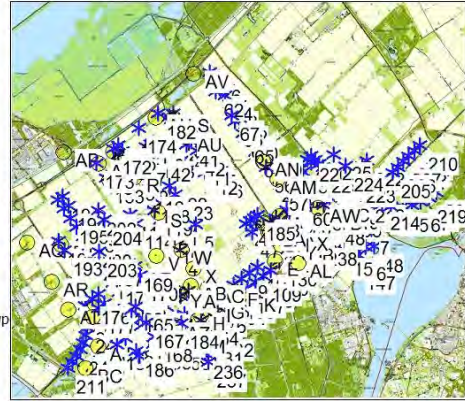
Maximum distance for influence 1. WTG distance circle radius
Minimum sun height over horizon for influence 5 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0,24 0,32 0,36 0,44 0,44 0,41 0,43 0,43 0,38 0,35 0,24 0,22

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
410 492 775 511 375 515 872 1.259 950 781 623 493 8.056
Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: 715027 SS_EMDGrid_0.wp
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in
Dutch Stereo-RD/NAP 2000



WTGs

X (east)	Y (north)	Z [m]	Row data/Description	WTG type			Shadow data				
				Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM
1	156.437	491.929	0,0 LAGERWEY 80 18.0 IO! ...No	LAGERWEY	-80		80	18,0	34,0	216	120,0
2	156.545	491.785	0,0 LAGERWEY 80 18.0 IO! ...No	LAGERWEY	-80		80	18,0	34,0	216	120,0
3	154.789	489.404	0,0 LAGERWEY 80 18.0 IO! ...No	LAGERWEY	-80		80	18,0	34,0	216	120,0
4	156.864	486.046	0,0 LAGERWEY 80 18.0 IO! ...No	LAGERWEY	-80		80	18,0	34,0	216	120,0
5	157.629	487.200	0,0 LAGERWEY 80 18.0 IO! ...No	LAGERWEY	-80		80	18,0	40,0	216	120,0
6	163.055	487.287	0,0 NEG MICON NM 48/600 ...No	NEG MICON	NM 48/600-600/150		600	48,0	55,0	576	21,0
7	166.095	487.004	0,0 NEG MICON NM48/750 7...No	NEG MICON	NM48/750-750/200		750	48,2	45,0	578	22,0
8	163.789	488.471	0,0 NEG MICON NM48/750 7...No	NEG MICON	NM48/750-750/200		750	48,2	55,0	578	22,0
9	160.224	485.023	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	35,0	624	22,4
10	157.270	484.229	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	35,0	624	22,4
11	157.983	490.110	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	35,0	624	22,4
12	158.290	489.690	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	35,0	624	22,4
13	162.069	488.665	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	55,0	624	22,4
14	162.135	487.659	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	55,0	624	22,4
15	164.822	486.036	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	55,0	624	22,4
16	165.457	485.835	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	55,0	624	22,4
17	156.551	492.176	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	55,0	624	22,4
18	156.610	491.641	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	55,0	624	22,4
19	156.815	491.787	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	55,0	624	22,4
20	156.903	491.211	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	55,0	624	22,4
21	163.461	487.731	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	55,0	624	22,4
22	158.511	483.328	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	70,0	624	22,4
23	161.988	487.861	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
24	156.240	483.517	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
25	160.654	490.273	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
26	160.858	490.415	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
27	161.351	489.350	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
28	159.254	492.644	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
29	160.721	490.605	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
30	160.255	491.241	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
31	160.106	491.443	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
32	159.726	491.974	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
33	159.547	492.227	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
34	159.025	492.982	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
35	158.791	493.327	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
36	158.465	493.811	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
37	158.313	483.181	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4
38	165.257	486.062	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54 Power Trim-950/200 950		950	54,5	55,0	654	22,4

To be continued on next page...



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SHADOW - Main Result

Calculation: SS Bestand totaal dubbeldraai - referentiewoningen

...continued from previous page

X (east)	Y (north)	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
				Valid	Manufact.					Calculation distance [m]	RPM [RPM]
39	157.110	491.347	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	55,0	654	22,4	
40	157.190	490.798	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	55,0	654	22,4	
41	157.395	490.942	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	55,0	654	22,4	
42	157.681	490.510	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	55,0	654	22,4	
43	161.697	486.585	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	55,0	654	22,4	
44	160.448	487.514	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	55,0	654	22,4	
45	160.072	487.248	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	55,0	654	22,4	
46	160.263	487.384	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	55,0	654	22,4	
47	160.353	486.848	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	55,0	654	22,4	
48	164.420	487.410	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
49	165.089	488.145	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
50	157.009	481.805	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
51	157.413	482.064	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
52	154.886	482.846	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
53	162.625	489.734	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
54	162.813	489.566	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
55	163.181	489.974	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
56	161.005	489.774	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
57	161.728	488.976	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
58	161.889	489.164	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
59	162.192	488.891	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
60	162.850	488.290	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
61	163.277	487.903	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
62	158.584	493.182	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
63	159.904	491.298	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
64	160.516	490.461	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
65	160.051	491.095	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
66	159.525	491.829	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
67	159.337	492.091	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
68	162.208	486.475	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
69	163.785	488.090	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
70	164.067	488.401	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
71	164.228	488.993	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
72	164.412	488.823	0,0 NEG MICON NM54 Power...No	NEG MICON	NM54	Power Trim-950/200950	54,5	70,0	654	22,4	
73	161.342	487.094	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	55,0	648	21,0
74	161.827	486.205	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	55,0	648	21,0
75	160.543	486.980	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	55,0	648	21,0
76	158.717	483.470	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
77	157.230	482.972	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
78	157.497	482.610	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
79	157.701	482.755	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
80	158.108	483.040	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
81	158.311	494.041	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
82	158.663	483.978	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
83	153.697	482.008	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
84	158.255	483.691	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
85	158.462	483.837	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
86	155.800	481.972	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
87	152.200	486.662	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
88	162.996	490.142	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
89	162.530	488.243	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
90	162.698	488.431	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
91	156.362	482.368	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
92	156.781	482.957	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
93	158.869	484.123	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
94	162.720	488.072	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
95	163.108	487.718	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
96	163.602	488.260	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54	1.000/250	1.000	54,0	70,0	648	21,0
97	166.210	486.222	0,0 NORDTANK 500 41.0 IO...No	NORDTANK	-500		500	41,0	52,0	492	27,0
98	160.887	487.086	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	40,0	624	22,4
99	161.036	486.879	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200		900	52,0	40,0	624	22,4
100	156.507	486.590	0,0 VESTAS V47 660 47.0 IO...No	VESTAS	V47-660		660	47,0	38,5	564	28,5
101	163.896	486.841	0,0 VESTAS V47 660 47.0 IO...No	VESTAS	V47-660		660	47,0	55,0	564	28,5
102	154.104	482.296	0,0 VESTAS V47 660 47.0 IO...No	VESTAS	V47-660		660	47,0	55,0	564	28,5

To be continued on next page...



Project:
715027 SS

Licensed user:
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0031742489940
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Calculated:
29-9-2016 16:41/3.0.654

SHADOW - Main Result

Calculation: SS Bestaand totaal dubbeldraai - referentiewoningen

...continued from previous page

	X (east)	Y (north)	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.					Calculation distance [m]	RPM
			[m]									
103	156.341	492.043	0,0	VESTAS V47 660 47.0 IO...No	VESTAS	V47-660	660	47,0	55,0	564	28,5	
104	159.207	483.818	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	35,0	624	26,0	
105	160.600	485.286	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	35,0	624	26,0	
106	159.618	484.116	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	35,0	624	26,0	
107	160.134	484.354	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	35,0	624	26,0	
108	160.512	484.615	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	35,0	624	26,0	
109	160.888	484.877	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	35,0	624	26,0	
110	161.249	485.134	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	35,0	624	26,0	
111	159.460	484.482	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	35,0	624	26,0	
112	159.838	484.748	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	35,0	624	26,0	
113	154.472	487.638	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
114	154.760	487.230	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
115	155.043	488.650	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
116	155.245	488.793	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
117	155.336	488.246	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
118	155.537	488.390	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
119	155.649	487.827	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
120	155.853	487.973	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
121	155.941	487.427	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
122	156.365	488.945	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
123	156.653	488.536	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
124	157.477	490.362	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
125	157.773	489.970	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
126	158.083	489.544	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	36,5	624	26,0	
127	161.390	486.367	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	40,0	624	26,0	
128	161.646	487.313	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
129	162.652	486.858	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
130	161.645	485.565	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
131	158.084	482.024	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
132	158.580	482.412	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
133	153.311	489.286	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
134	153.892	490.332	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
135	154.093	490.477	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
136	154.177	489.924	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
137	154.381	490.070	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
138	154.462	489.490	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
139	154.664	489.632	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
140	155.251	490.683	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
141	155.457	490.826	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
142	155.549	490.266	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
143	155.750	490.411	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
144	156.756	484.191	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
145	156.901	483.979	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
146	161.218	489.904	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
147	165.435	485.425	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
148	165.797	486.205	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
149	155.895	483.569	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
150	157.100	483.174	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
151	161.199	487.299	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
152	161.502	487.519	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	55,0	624	26,0	
153	164.751	487.777	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
154	157.905	482.901	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
155	155.021	482.641	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
156	153.076	485.408	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
157	153.285	485.552	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
158	153.365	484.996	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
159	153.638	484.578	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
160	153.923	484.169	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
161	154.127	484.311	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
162	154.222	483.761	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
163	154.423	483.906	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
164	154.521	483.357	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
165	154.729	483.500	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
166	155.089	482.991	0,0	VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	

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Project:
715027 SS

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0031742489940
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Calculatiedat:
29-9-2016 16:41/3.0.654

SHADOW - Main Result

Calculation: SS Bestaand totaal dubbeldraai - referentiewoningen

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X (east)	Y (north)	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
				Valid	Manufact.					Calculation distance [m]	RPM [RPM]
167	155.228	482.782	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
168	155.651	482.172	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
169	154.680	485.311	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
170	154.960	484.911	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
171	153.843	484.722	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
172	153.691	490.591	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
173	152.844	489.946	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
174	154.903	491.526	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
175	153.901	490.748	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
176	152.639	483.862	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
177	152.927	483.455	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
178	152.928	484.065	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
179	153.218	483.659	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
180	153.842	481.800	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
181	154.245	482.087	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
182	155.817	492.173	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
183	156.220	482.568	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
184	156.924	482.750	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
185	160.594	487.617	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
186	154.744	481.512	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
187	154.889	481.308	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
188	155.592	481.827	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
189	151.010	488.321	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
190	151.024	486.444	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
191	151.215	488.463	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
192	151.291	487.907	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
193	151.307	486.032	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
194	151.496	488.048	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
195	151.590	487.481	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
196	151.882	487.076	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
197	152.089	487.219	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
198	152.404	486.804	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
199	152.496	486.246	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
200	152.703	486.386	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
201	152.779	485.834	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
202	152.941	487.817	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
203	152.983	485.976	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
204	153.231	487.410	0,0 VESTAS V52 850 52.0 IO...Yes	VESTAS	V52-850	850	52,0	70,0	624	26,0	
205	167.111	489.551	0,0 VESTAS V66 1750 66.0 I...No	VESTAS	V66-1.750	1.750	66,0	67,0	792	21,3	
206	167.368	489.800	0,0 VESTAS V66 1750 66.0 I...No	VESTAS	V66-1.750	1.750	66,0	67,0	792	21,3	
207	167.626	490.044	0,0 VESTAS V66 1750 66.0 I...No	VESTAS	V66-1.750	1.750	66,0	67,0	792	21,3	
208	167.883	490.292	0,0 VESTAS V66 1750 66.0 I...No	VESTAS	V66-1.750	1.750	66,0	67,0	792	21,3	
209	168.143	490.536	0,0 VESTAS V66 1750 66.0 I...No	VESTAS	V66-1.750	1.750	66,0	67,0	792	21,3	
210	168.400	490.784	0,0 VESTAS V66 1750 66.0 I...No	VESTAS	V66-1.750	1.750	66,0	67,0	792	21,3	
211	151.462	480.761	0,0 VESTAS V80-2.0MW 200...Yes	VESTAS	V80-2.0MW-2.000	2.000	80,0	68,0	960	16,7	
212	165.852	488.427	0,0 ENERCON E-82 E3 3000 ...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
213	166.220	488.239	0,0 ENERCON E-82 E3 3000 ...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
214	166.602	488.106	0,0 ENERCON E-82 E3 3000 ...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
215	167.004	488.029	0,0 ENERCON E-82 E3 3000 ...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
216	167.589	488.020	0,0 ENERCON E-82 E3 3000 ...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
217	168.032	488.088	0,0 ENERCON E-82 E3 3000 ...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
218	168.453	488.222	0,0 ENERCON E-82 E3 3000 ...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
219	168.855	488.412	0,0 ENERCON E-82 E3 3000 ...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
220	169.215	488.669	0,0 ENERCON E-82 E3 3000 ...Yes	ENERCON	E-82 E3-3.000	3.000	82,0	108,4	984	17,5	
221	165.652	489.851	0,0 ENERCON E-70 E4 2000 ...No	ENERCON	E-70 E4-2.000	2.000	71,0	70,0	852	20,0	
222	165.874	490.077	0,0 ENERCON E-70 E4 2000 ...No	ENERCON	E-70 E4-2.000	2.000	71,0	70,0	852	20,0	
223	165.402	489.335	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200	900	52,0	55,0	624	22,4	
224	164.828	489.846	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200	900	52,0	55,0	624	22,4	
225	164.268	490.359	0,0 NEG MICON NM52/900 9...No	NEG MICON	NM52/900-900/200	900	52,0	55,0	624	22,4	
226	163.188	490.274	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
227	163.372	490.106	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
228	163.559	489.940	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
229	163.743	489.772	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
230	163.932	489.606	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	

To be continued on next page...

Project:
715027 SS

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29-9-2016 16:41/3.0.654

SHADOW - Main Result

Calculation: SS Bestand totaal dubbeldraai - referentiewoningen

...continued from previous page

X (east)	Y (north)	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
				Valid	Manufact.					Calculation distance [m]	RPM
231	164.118	489.439	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
232	164.303	489.272	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
233	164.491	489.105	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
234	164.675	488.938	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
235	164.862	488.772	0,0 NEG MICON NM1000/54 ...No	NEG MICON	NM1000/54-1.000/250	1.000	54,0	55,0	648	21,0	
236	158.078	481.403	0,0 REpower 3.4M104 3400 ...No	REpower	3.4M104-3.400	3.400	104,0	98,0	1.248	13,8	
237	158.240	481.027	0,0 REpower 3.4M104 3400 ...No	REpower	3.4M104-3.400	3.400	104,0	98,0	1.248	13,8	
238	163.576	486.486	0,0 VESTAS V47 660 47.0 IO...No	VESTAS	V47-660	660	47,0	55,0	564	28,5	
239	152.326	482.225	0,0 VESTAS V80-2.0MW 200...Yes	VESTAS	V80-2.0MW-2.000	2.000	80,0	68,0	960	16,7	
240	151.676	481.024	0,0 VESTAS V80-2.0MW 200...Yes	VESTAS	V80-2.0MW-2.000	2.000	80,0	68,0	960	16,7	
241	151.882	481.295	0,0 VESTAS V80-2.0MW 200...Yes	VESTAS	V80-2.0MW-2.000	2.000	80,0	68,0	960	16,7	
242	152.068	481.580	0,0 VESTAS V80-2.0MW 200...Yes	VESTAS	V80-2.0MW-2.000	2.000	80,0	68,0	960	16,7	
243	152.219	481.895	0,0 VESTAS V80-2.0MW 200...Yes	VESTAS	V80-2.0MW-2.000	2.000	80,0	68,0	960	16,7	
244	152.390	482.579	0,0 VESTAS V80-2.0MW 200...Yes	VESTAS	V80-2.0MW-2.000	2.000	80,0	68,0	960	16,7	
245	152.406	482.909	0,0 VESTAS V80-2.0MW 200...Yes	VESTAS	V80-2.0MW-2.000	2.000	80,0	68,0	960	16,7	
246	152.309	483.577	0,0 VESTAS V80-2.0MW 200...Yes	VESTAS	V80-2.0MW-2.000	2.000	80,0	68,0	960	16,7	
247	152.399	483.249	0,0 VESTAS V80-2.0MW 200...Yes	VESTAS	V80-2.0MW-2.000	2.000	80,0	68,0	960	16,7	

Shadow receptor-Input

No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
	[m]	[m]	[m]	[m]	[m]	[m]	[°]	[°]	
A	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
C	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
D	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
E	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
F	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
G	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
H	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
I	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
J	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
K	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
L	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
M	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
N	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
O	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
P	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Q	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
R	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
S	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
T	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
U	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
V	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
W	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
X	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Y	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Z	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AA	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AB	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AC	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AD	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AE	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AF	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AG	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AH	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AI	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AJ	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AK	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AL	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AM	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AN	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"

To be continued on next page...



Project:
715027 SS

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29-9-2016 16:41/3.0.654

SHADOW - Main Result

Calculation: SS Bestaand totaal dubbeldraai - referentiewoningen

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No.	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[°]	[°]	
AO	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AP	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AQ	149.533	486.385	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AR	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AS	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AT	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AU	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AV	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AW	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AX	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AY	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
AZ	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BA	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BB	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BC	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BD	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BE	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BF	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BG	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
BH	161.366	486.618	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

No.	Shadow, worst case		Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
A	193:56	216	1:27	38:24
B	0:00	0	0:00	0:00
C	113:37	137	1:12	19:34
D	113:18	126	1:08	18:38
E	140:14	146	1:15	34:34
F	328:36	253	2:20	63:08
G	221:30	243	1:50	45:55
H	285:54	241	2:04	52:32
I	352:30	319	1:41	75:56
J	397:55	280	2:18	89:19
K	0:00	0	0:00	0:00
L	351:07	223	2:55	77:18
M	78:09	136	1:04	16:01
N	135:53	199	0:57	27:14
O	0:00	0	0:00	0:00
P	128:17	192	0:55	25:37
Q	61:11	112	0:44	9:16
R	0:00	0	0:00	0:00
S	48:23	100	0:45	9:35
T	169:23	180	1:13	27:33
U	71:23	117	0:48	10:54
V	0:00	0	0:00	0:00
W	80:32	92	1:05	18:14
X	0:00	0	0:00	0:00
Y	129:02	145	1:26	22:41
Z	326:21	197	2:21	69:09
AA	264:07	205	2:06	52:47
AB	73:53	86	0:59	11:09
AC	23:54	75	0:26	3:24
AD	8:53	50	0:18	2:06
AE	49:44	71	0:56	9:15
AF	66:32	116	0:54	12:56
AG	119:42	94	1:36	27:54
AH	0:00	0	0:00	0:00
AI	140:55	222	1:07	26:55
AJ	11:42	56	0:23	2:36

To be continued on next page...

windPRO 3.0.654 by EMD International A/S, Tel. +45 96 35 44 44, www.emd.dk, windpro@emd.dk

30-9-2016 11:11 / 6



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715027 SS

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Calculated:
29-9-2016 16:41/3.0.654

SHADOW - Main Result

Calculation: SS Bestaand totaal dubbeldraai - referentiewoningen

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No.	Shadow, worst case			Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
AK	110:34	151	1:06	21:33
AL	0:00	0	0:00	0:00
AM	99:42	157	0:55	17:08
AN	107:11	155	0:55	16:01
AO	155:41	187	1:09	25:03
AP	0:00	0	0:00	0:00
AQ	0:00	0	0:00	0:00
AR	0:00	0	0:00	0:00
AS	167:13	260	0:57	32:57
AT	216:22	305	1:16	40:35
AU	136:12	198	0:57	27:05
AV	0:00	0	0:00	0:00
AW	173:32	224	1:08	32:24
AX	126:34	205	1:03	25:34
AY	319:25	225	2:05	70:41
AZ	93:35	174	0:48	21:14
BA	97:06	189	1:05	22:12
BB	237:04	292	1:17	47:03
BC	23:36	94	0:27	5:22
BD	41:39	65	0:51	8:02
BE	59:14	96	0:50	8:33
BF	263:07	275	1:57	46:32
BG	195:03	159	1:54	42:40
BH	61:38	132	0:44	10:47

Total amount of flickering on the shadow receptors caused by each WTG
No. Name

No.	Name	Worst case [h/year]	Expected [h/year]
1	LAGERWEY 80 18.0 !OI! hub: 34,0 m (TOT: 43,0 m) (1)	43:46	9:56
2	LAGERWEY 80 18.0 !OI! hub: 34,0 m (TOT: 43,0 m) (2)	60:28	9:34
3	LAGERWEY 80 18.0 !OI! hub: 34,0 m (TOT: 43,0 m) (3)	0:00	0:00
4	LAGERWEY 80 18.0 !OI! hub: 34,0 m (TOT: 43,0 m) (4)	80:32	18:14
5	LAGERWEY 80 18.0 !OI! hub: 40,0 m (TOT: 49,0 m) (5)	0:00	0:00
6	NEG MICON NM 48/600 600-150 48.0 !OI! hub: 55,0 m (TOT: 79,0 m) (6)	0:00	0:00
7	NEG MICON NM48/750 750-200 48.2 !OI! hub: 45,0 m (TOT: 69,1 m) (7)	0:00	0:00
8	NEG MICON NM48/750 750-200 48.2 !OI! hub: 55,0 m (TOT: 79,1 m) (8)	0:00	0:00
9	NEG MICON NM52/900 900-200 52.0 !OI! hub: 35,0 m (TOT: 61,0 m) (9)	0:00	0:00
10	NEG MICON NM52/900 900-200 52.0 !OI! hub: 35,0 m (TOT: 61,0 m) (10)	100:55	18:01
11	NEG MICON NM52/900 900-200 52.0 !OI! hub: 35,0 m (TOT: 61,0 m) (11)	0:00	0:00
12	NEG MICON NM52/900 900-200 52.0 !OI! hub: 35,0 m (TOT: 61,0 m) (12)	0:00	0:00
13	NEG MICON NM52/900 900-200 52.0 !OI! hub: 55,0 m (TOT: 81,0 m) (13)	0:00	0:00
14	NEG MICON NM52/900 900-200 52.0 !OI! hub: 55,0 m (TOT: 81,0 m) (14)	15:27	3:51
15	NEG MICON NM52/900 900-200 52.0 !OI! hub: 55,0 m (TOT: 81,0 m) (15)	0:00	0:00
16	NEG MICON NM52/900 900-200 52.0 !OI! hub: 55,0 m (TOT: 81,0 m) (16)	0:00	0:00
17	NEG MICON NM52/900 900-200 52.0 !OI! hub: 55,0 m (TOT: 81,0 m) (17)	0:00	0:00
18	NEG MICON NM52/900 900-200 52.0 !OI! hub: 55,0 m (TOT: 81,0 m) (18)	54:00	7:43
19	NEG MICON NM52/900 900-200 52.0 !OI! hub: 55,0 m (TOT: 81,0 m) (19)	86:23	15:22
20	NEG MICON NM52/900 900-200 52.0 !OI! hub: 55,0 m (TOT: 81,0 m) (20)	83:03	18:23
21	NEG MICON NM52/900 900-200 52.0 !OI! hub: 55,0 m (TOT: 81,0 m) (21)	109:39	17:04
22	NEG MICON NM52/900 900-200 52.0 !OI! hub: 70,0 m (TOT: 96,0 m) (22)	186:09	38:31
23	NEG MICON NM54 Power Trim 950-200 54.5 !OI! hub: 55,0 m (TOT: 82,3 m) (23)	0:00	0:00
24	NEG MICON NM54 Power Trim 950-200 54.5 !OI! hub: 55,0 m (TOT: 82,3 m) (24)	0:00	0:00
25	NEG MICON NM54 Power Trim 950-200 54.5 !OI! hub: 55,0 m (TOT: 82,3 m) (25)	0:00	0:00
26	NEG MICON NM54 Power Trim 950-200 54.5 !OI! hub: 55,0 m (TOT: 82,3 m) (26)	0:00	0:00
27	NEG MICON NM54 Power Trim 950-200 54.5 !OI! hub: 55,0 m (TOT: 82,3 m) (27)	0:00	0:00
28	NEG MICON NM54 Power Trim 950-200 54.5 !OI! hub: 55,0 m (TOT: 82,3 m) (28)	0:00	0:00
29	NEG MICON NM54 Power Trim 950-200 54.5 !OI! hub: 55,0 m (TOT: 82,3 m) (29)	0:00	0:00
30	NEG MICON NM54 Power Trim 950-200 54.5 !OI! hub: 55,0 m (TOT: 82,3 m) (30)	0:00	0:00
31	NEG MICON NM54 Power Trim 950-200 54.5 !OI! hub: 55,0 m (TOT: 82,3 m) (31)	0:00	0:00
32	NEG MICON NM54 Power Trim 950-200 54.5 !OI! hub: 55,0 m (TOT: 82,3 m) (32)	0:00	0:00
33	NEG MICON NM54 Power Trim 950-200 54.5 !OI! hub: 55,0 m (TOT: 82,3 m) (33)	0:00	0:00
34	NEG MICON NM54 Power Trim 950-200 54.5 !OI! hub: 55,0 m (TOT: 82,3 m) (34)	0:00	0:00

To be continued on next page...



Project:
715027 SS

Licensed user:
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0031742489940
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Calculated:
29-9-2016 16:41/3.0.654

SHADOW - Main Result

Calculation: SS Bestaand totaal dubbeldraai - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
35	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (35)	0:00	0:00
36	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (36)	0:00	0:00
37	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (37)	105:45	19:18
38	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (38)	0:00	0:00
39	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (39)	0:00	0:00
40	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (40)	12:22	1:38
41	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (41)	40:47	6:53
42	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (42)	0:00	0:00
43	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (43)	50:19	10:12
44	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (44)	24:56	5:48
45	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (45)	0:00	0:00
46	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (46)	5:14	1:16
47	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 55,0 m (TOT: 82,3 m) (47)	4:59	0:51
48	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (48)	113:18	18:38
49	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (49)	0:00	0:00
50	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (50)	0:00	0:00
51	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (51)	38:02	9:02
52	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (52)	0:00	0:00
53	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (53)	0:00	0:00
54	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (54)	0:00	0:00
55	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (55)	0:00	0:00
56	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (56)	146:33	21:24
57	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (57)	66:38	9:44
58	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (58)	33:04	7:25
59	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (59)	0:00	0:00
60	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (60)	0:00	0:00
61	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (61)	48:52	11:44
62	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (62)	0:00	0:00
63	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (63)	0:00	0:00
64	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (64)	0:00	0:00
65	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (65)	0:00	0:00
66	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (66)	0:00	0:00
67	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (67)	0:00	0:00
68	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (68)	122:08	24:12
69	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (69)	0:00	0:00
70	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (70)	0:00	0:00
71	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (71)	0:00	0:00
72	NEG MICON NMS4 Power Trim 950-200 54.5 IO! hub: 70,0 m (TOT: 97,3 m) (72)	0:00	0:00
73	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (73)	46:56	7:53
74	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (74)	269:20	57:34
75	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 55,0 m (TOT: 82,0 m) (75)	27:22	5:24
76	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (76)	274:45	62:42
77	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (77)	13:19	3:12
78	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (78)	46:44	7:17
79	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (79)	169:15	30:35
80	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (80)	135:52	30:31
81	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (81)	0:00	0:00
82	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (82)	11:15	1:48
83	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (83)	0:00	0:00
84	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (84)	17:16	4:01
85	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (85)	12:39	1:35
86	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (86)	0:00	0:00
87	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (87)	0:00	0:00
88	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (88)	0:00	0:00
89	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (89)	0:00	0:00
90	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (90)	0:00	0:00
91	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (91)	28:36	5:07
92	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (92)	0:00	0:00
93	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (93)	0:00	0:00
94	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (94)	0:00	0:00
95	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (95)	15:01	3:10
96	NEG MICON NM1000/54 1000-250 54.0 IO! hub: 70,0 m (TOT: 97,0 m) (96)	0:00	0:00
97	ORDTANK 500 41.0 IO! hub: 52,0 m (TOT: 72,5 m) (97)	0:00	0:00
98	NEG MICON NMS2/900 900-200 52.0 IO! hub: 40,0 m (TOT: 66,0 m) (98)	298:14	46:06
99	NEG MICON NMS2/900 900-200 52.0 IO! hub: 40,0 m (TOT: 66,0 m) (99)	219:12	49:08

To be continued on next page...

windPRO 3.0.654 by EMD International A/S, Tel. +45 96 35 44 44, www.emd.dk, windpro@emd.dk

30-9-2016 11:11 / 8



Project:
715027 SS

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Calculated:
29-9-2016 16:41/3.0.654

SHADOW - Main Result

Calculation: SS Bestaand totaal dubbeldraai - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
100	VESTAS V47 660 47.0 !OI hub: 38,5 m (TOT: 62,0 m) (100)	0:00	0:00
101	VESTAS V47 660 47.0 !OI hub: 55,0 m (TOT: 78,5 m) (101)	0:00	0:00
102	VESTAS V47 660 47.0 !OI hub: 55,0 m (TOT: 78,5 m) (102)	0:00	0:00
103	VESTAS V47 660 47.0 !OI hub: 55,0 m (TOT: 78,5 m) (103)	114:56	25:23
104	VESTAS V52 850 52.0 !OI hub: 35,0 m (TOT: 61,0 m) (104)	20:00	4:01
105	VESTAS V52 850 52.0 !OI hub: 35,0 m (TOT: 61,0 m) (105)	0:00	0:00
106	VESTAS V52 850 52.0 !OI hub: 35,0 m (TOT: 61,0 m) (106)	315:31	60:51
107	VESTAS V52 850 52.0 !OI hub: 35,0 m (TOT: 61,0 m) (107)	1:39	0:25
108	VESTAS V52 850 52.0 !OI hub: 35,0 m (TOT: 61,0 m) (108)	0:00	0:00
109	VESTAS V52 850 52.0 !OI hub: 35,0 m (TOT: 61,0 m) (109)	0:00	0:00
110	VESTAS V52 850 52.0 !OI hub: 35,0 m (TOT: 61,0 m) (110)	0:00	0:00
111	VESTAS V52 850 52.0 !OI hub: 35,0 m (TOT: 61,0 m) (111)	0:00	0:00
112	VESTAS V52 850 52.0 !OI hub: 35,0 m (TOT: 61,0 m) (112)	0:00	0:00
113	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (113)	0:00	0:00
114	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (114)	0:00	0:00
115	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (115)	0:00	0:00
116	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (116)	0:00	0:00
117	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (117)	0:00	0:00
118	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (118)	0:00	0:00
119	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (119)	34:56	7:47
120	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (120)	0:00	0:00
121	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (121)	13:27	1:43
122	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (122)	0:00	0:00
123	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (123)	0:00	0:00
124	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (124)	0:00	0:00
125	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (125)	0:00	0:00
126	VESTAS V52 850 52.0 !OI hub: 36,5 m (TOT: 62,5 m) (126)	0:00	0:00
127	VESTAS V52 850 52.0 !OI hub: 40,0 m (TOT: 66,0 m) (127)	48:02	8:50
128	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (128)	68:09	9:58
129	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (129)	33:51	8:52
130	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (130)	140:14	34:34
131	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (131)	361:09	79:01
132	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (132)	9:55	2:35
133	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (133)	0:00	0:00
134	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (134)	137:07	28:15
135	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (135)	17:27	4:05
136	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (136)	153:12	21:19
137	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (137)	110:15	20:58
138	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (138)	0:00	0:00
139	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (139)	0:00	0:00
140	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (140)	78:30	17:25
141	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (141)	0:00	0:00
142	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (142)	55:59	7:22
143	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (143)	65:11	11:29
144	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (144)	0:00	0:00
145	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (145)	632:59	125:33
146	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (146)	54:28	10:29
147	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (147)	0:00	0:00
148	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (148)	0:00	0:00
149	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (149)	0:00	0:00
150	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (150)	0:00	0:00
151	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (151)	95:54	23:34
152	VESTAS V52 850 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (152)	95:31	22:34
153	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (153)	113:37	19:34
154	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (154)	290:54	61:21
155	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (155)	0:00	0:00
156	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (156)	0:00	0:00
157	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (157)	0:00	0:00
158	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (158)	0:00	0:00
159	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (159)	0:00	0:00
160	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (160)	0:00	0:00
161	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (161)	0:00	0:00
162	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (162)	0:00	0:00
163	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (163)	0:00	0:00
164	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (164)	0:00	0:00

To be continued on next page...



Project:
715027 SS

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Calculated:
29-9-2016 16:41/3.0.654

SHADOW - Main Result

Calculation: SS Bestaand totaal dubbeldraai - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
165	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (165)	0:00	0:00
166	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (166)	0:00	0:00
167	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (167)	0:00	0:00
168	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (168)	0:00	0:00
169	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (169)	0:00	0:00
170	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (170)	49:44	9:15
171	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (171)	0:00	0:00
172	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (172)	0:00	0:00
173	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (173)	119:42	27:54
174	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (174)	0:00	0:00
175	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (175)	0:00	0:00
176	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (176)	0:00	0:00
177	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (177)	63:03	11:03
178	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (178)	0:00	0:00
179	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (179)	17:47	4:25
180	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (180)	0:00	0:00
181	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (181)	0:00	0:00
182	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (182)	0:00	0:00
183	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (183)	16:25	3:33
184	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (184)	48:34	12:30
185	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (185)	0:00	0:00
186	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (186)	0:00	0:00
187	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (187)	0:00	0:00
188	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (188)	0:00	0:00
189	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (189)	0:00	0:00
190	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (190)	0:00	0:00
191	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (191)	0:00	0:00
192	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (192)	0:00	0:00
193	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (193)	59:14	8:33
194	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (194)	0:00	0:00
195	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (195)	0:00	0:00
196	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (196)	0:00	0:00
197	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (197)	0:00	0:00
198	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (198)	0:00	0:00
199	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (199)	0:00	0:00
200	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (200)	0:00	0:00
201	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (201)	0:00	0:00
202	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (202)	0:00	0:00
203	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (203)	0:00	0:00
204	VESTAS V52 850 52.0 !OI hub: 70,0 m (TOT: 96,0 m) (204)	41:39	8:02
205	VESTAS V66 1750 66.0 !OI hub: 67,0 m (TOT: 100,0 m) (205)	0:00	0:00
206	VESTAS V66 1750 66.0 !OI hub: 67,0 m (TOT: 100,0 m) (212)	0:00	0:00
207	VESTAS V66 1750 66.0 !OI hub: 67,0 m (TOT: 100,0 m) (213)	0:00	0:00
208	VESTAS V66 1750 66.0 !OI hub: 67,0 m (TOT: 100,0 m) (214)	0:00	0:00
209	VESTAS V66 1750 66.0 !OI hub: 67,0 m (TOT: 100,0 m) (215)	0:00	0:00
210	VESTAS V66 1750 66.0 !OI hub: 67,0 m (TOT: 100,0 m) (216)	0:00	0:00
211	VESTAS V80-2.0MW 2000 80.0 !OI hub: 68,0 m (TOT: 108,0 m) (217)	3:52	0:53
212	ENERCON E-82 E3 3000 82.0 !OI hub: 108,4 m (TOT: 149,4 m) (218)	0:00	0:00
213	ENERCON E-82 E3 3000 82.0 !OI hub: 108,4 m (TOT: 149,4 m) (219)	0:00	0:00
214	ENERCON E-82 E3 3000 82.0 !OI hub: 108,4 m (TOT: 149,4 m) (220)	0:00	0:00
215	ENERCON E-82 E3 3000 82.0 !OI hub: 108,4 m (TOT: 149,4 m) (221)	0:00	0:00
216	ENERCON E-82 E3 3000 82.0 !OI hub: 108,4 m (TOT: 149,4 m) (222)	0:00	0:00
217	ENERCON E-82 E3 3000 82.0 !OI hub: 108,4 m (TOT: 149,4 m) (223)	0:00	0:00
218	ENERCON E-82 E3 3000 82.0 !OI hub: 108,4 m (TOT: 149,4 m) (224)	0:00	0:00
219	ENERCON E-82 E3 3000 82.0 !OI hub: 108,4 m (TOT: 149,4 m) (225)	0:00	0:00
220	ENERCON E-82 E3 3000 82.0 !OI hub: 108,4 m (TOT: 149,4 m) (226)	0:00	0:00
221	ENERCON E-70 E4 2000 71.0 !OI hub: 70,0 m (TOT: 105,5 m) (227)	0:00	0:00
222	ENERCON E-70 E4 2000 71.0 !OI hub: 70,0 m (TOT: 105,5 m) (228)	0:00	0:00
223	NEG MICON NM52/900 900-200 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (229)	0:00	0:00
224	NEG MICON NM52/900 900-200 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (230)	0:00	0:00
225	NEG MICON NM52/900 900-200 52.0 !OI hub: 55,0 m (TOT: 81,0 m) (231)	0:00	0:00
226	NEG MICON NM1000/54 1000-250 54.0 !OI hub: 55,0 m (TOT: 82,0 m) (232)	0:00	0:00
227	NEG MICON NM1000/54 1000-250 54.0 !OI hub: 55,0 m (TOT: 82,0 m) (233)	0:00	0:00
228	NEG MICON NM1000/54 1000-250 54.0 !OI hub: 55,0 m (TOT: 82,0 m) (234)	0:00	0:00
229	NEG MICON NM1000/54 1000-250 54.0 !OI hub: 55,0 m (TOT: 82,0 m) (235)	0:00	0:00

To be continued on next page...

windPRO 3.0.654 by EMD International A/S, Tel. +45 96 35 44 44, www.emd.dk, windpro@emd.dk

30-9-2016 11:11 / 10



Project:
715027 SS

Licensed user:
Pondera Consult B.V.
Welbergweg 49
NL-7556 PE Hengelo
0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
29-9-2016 16:41/3.0.654

SHADOW - Main Result

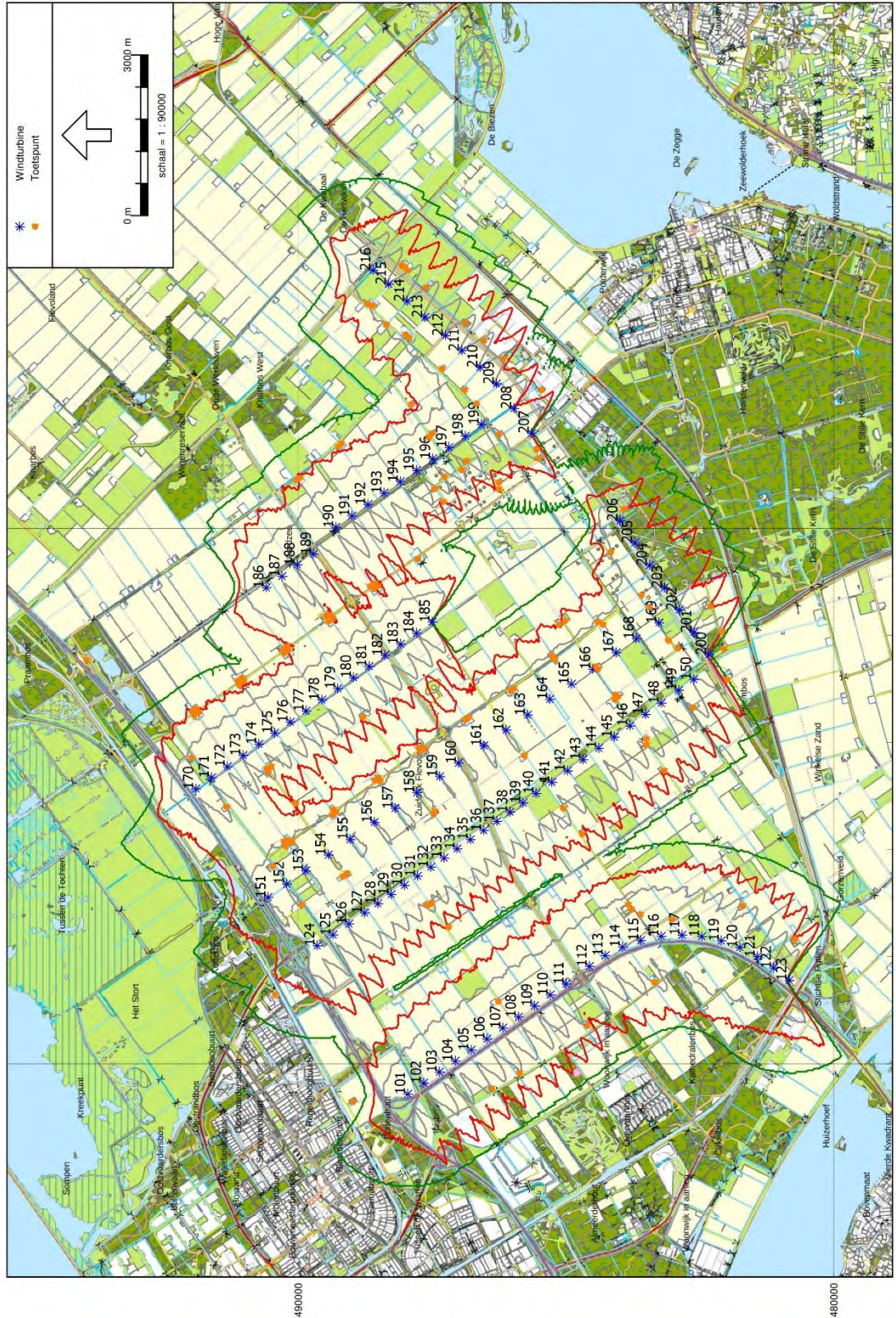
Calculation: SS Bestaand totaal dubbeldraai - referentiewoningen

...continued from previous page
No. Name

No.	Name	Worst case [h/year]	Expected [h/year]
230	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (236)	0:00	0:00
231	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (237)	0:00	0:00
232	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (238)	0:00	0:00
233	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (239)	0:00	0:00
234	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (240)	0:00	0:00
235	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (241)	0:00	0:00
236	REpower 3.4M104 3400 104.0 !O! hub: 98,0 m (TOT: 150,0 m) (242)	18:58	2:24
237	REpower 3.4M104 3400 104.0 !O! hub: 98,0 m (TOT: 150,0 m) (243)	0:00	0:00
238	VESTAS V47 660 47.0 !O! hub: 55,0 m (TOT: 78,5 m) (244)	0:00	0:00
239	VESTAS V80-2.0MW 2000 80.0 !O! hub: 68,0 m (TOT: 108,0 m) (245)	0:00	0:00
240	VESTAS V80-2.0MW 2000 80.0 !O! hub: 68,0 m (TOT: 108,0 m) (246)	19:44	4:29
241	VESTAS V80-2.0MW 2000 80.0 !O! hub: 68,0 m (TOT: 108,0 m) (247)	0:00	0:00
242	VESTAS V80-2.0MW 2000 80.0 !O! hub: 68,0 m (TOT: 108,0 m) (248)	3:12	0:40
243	VESTAS V80-2.0MW 2000 80.0 !O! hub: 68,0 m (TOT: 108,0 m) (249)	8:30	1:55
244	VESTAS V80-2.0MW 2000 80.0 !O! hub: 68,0 m (TOT: 108,0 m) (250)	40:43	6:04
245	VESTAS V80-2.0MW 2000 80.0 !O! hub: 68,0 m (TOT: 108,0 m) (251)	69:51	15:19
246	VESTAS V80-2.0MW 2000 80.0 !O! hub: 68,0 m (TOT: 108,0 m) (252)	33:26	7:42
247	VESTAS V80-2.0MW 2000 80.0 !O! hub: 68,0 m (TOT: 108,0 m) (253)	35:32	5:42

BIJLAGE 59 ALT 1A - SLAGSCHADUWCONTOUREN

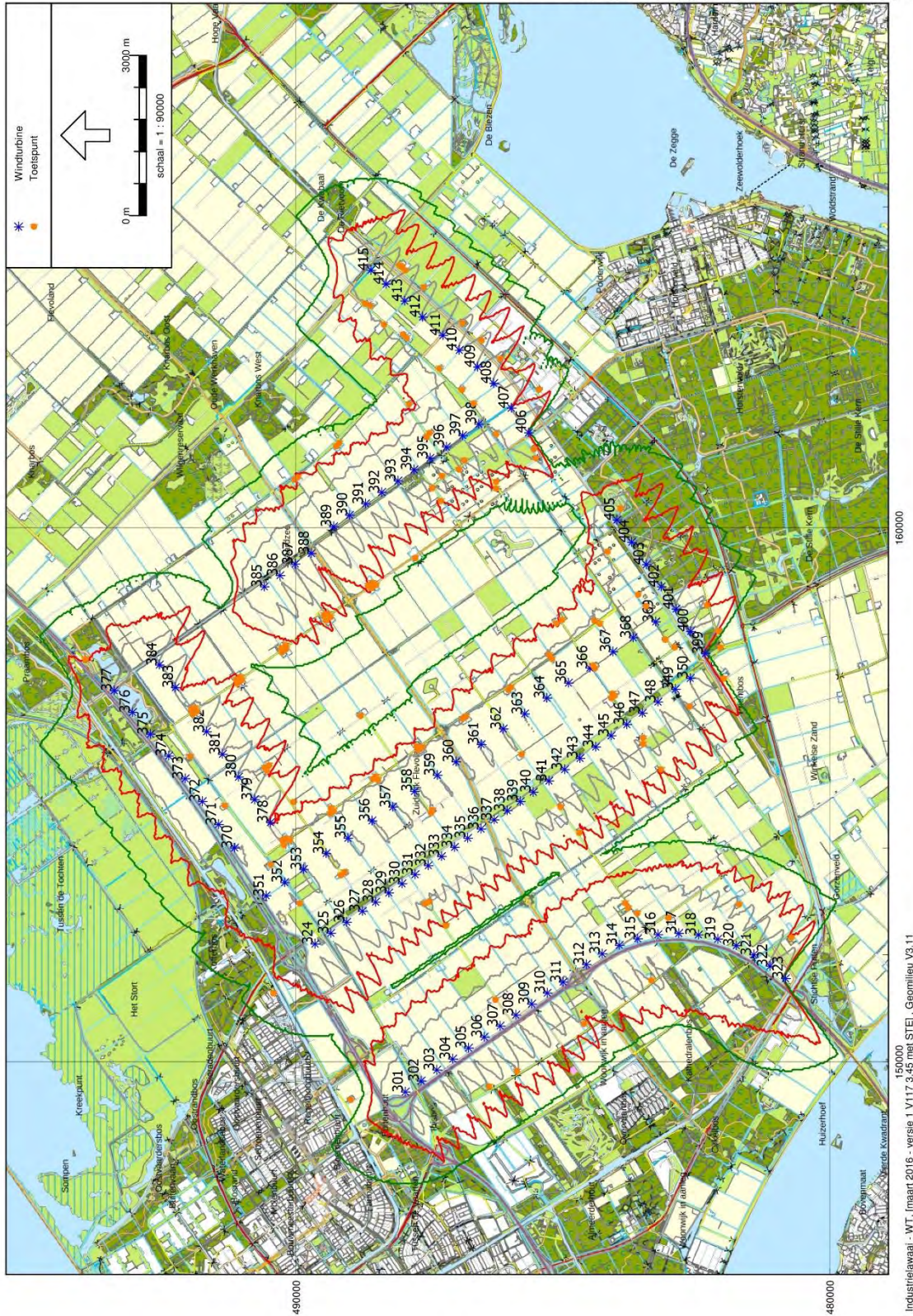
Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



Industrielaar - WT, (maart 2016 - versie 1 V117 3.45 met STE), Geomilieu V3.11

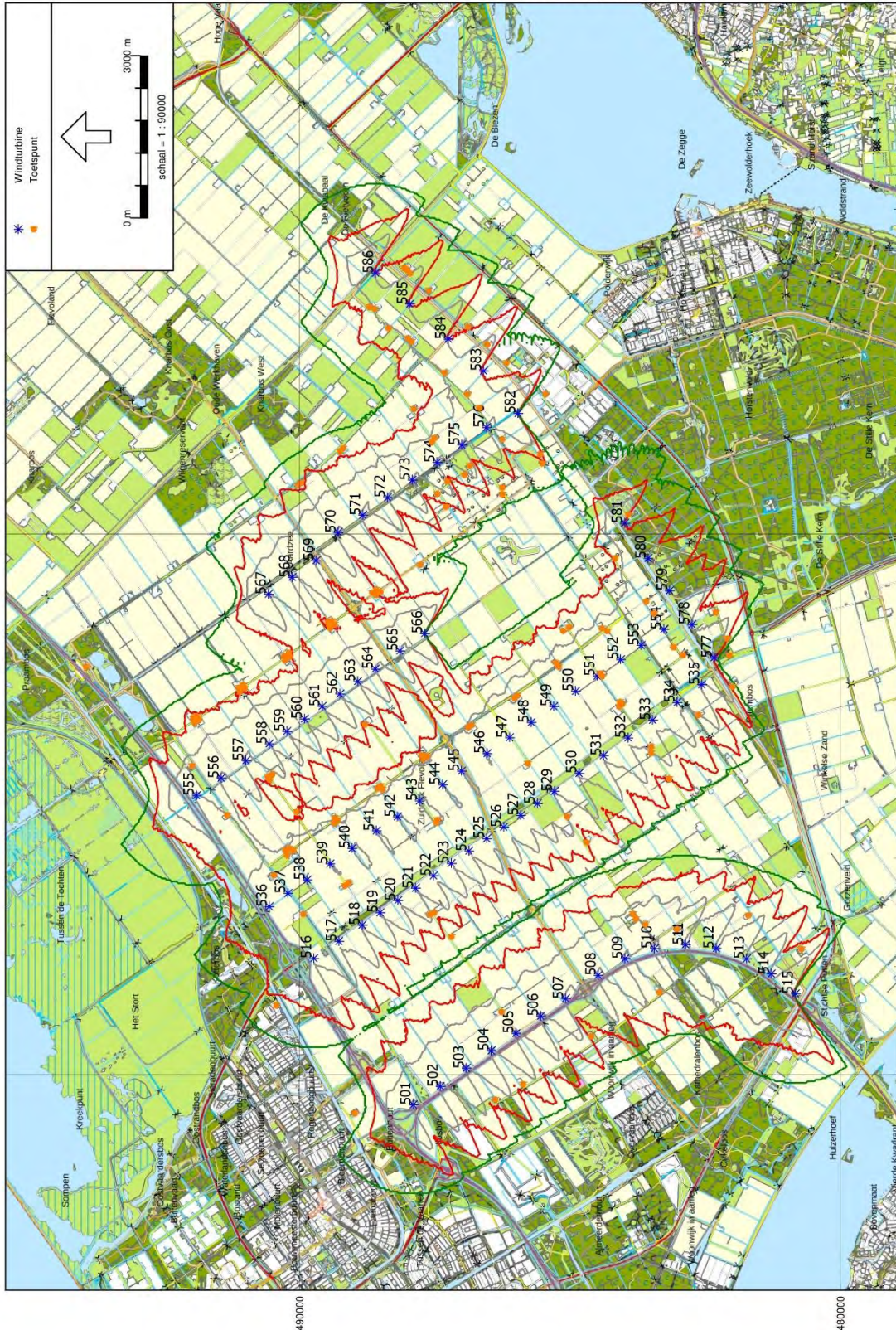
BIJLAGE 60 ALT 1B - SLAGSCHADUWCONTOUREN

Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



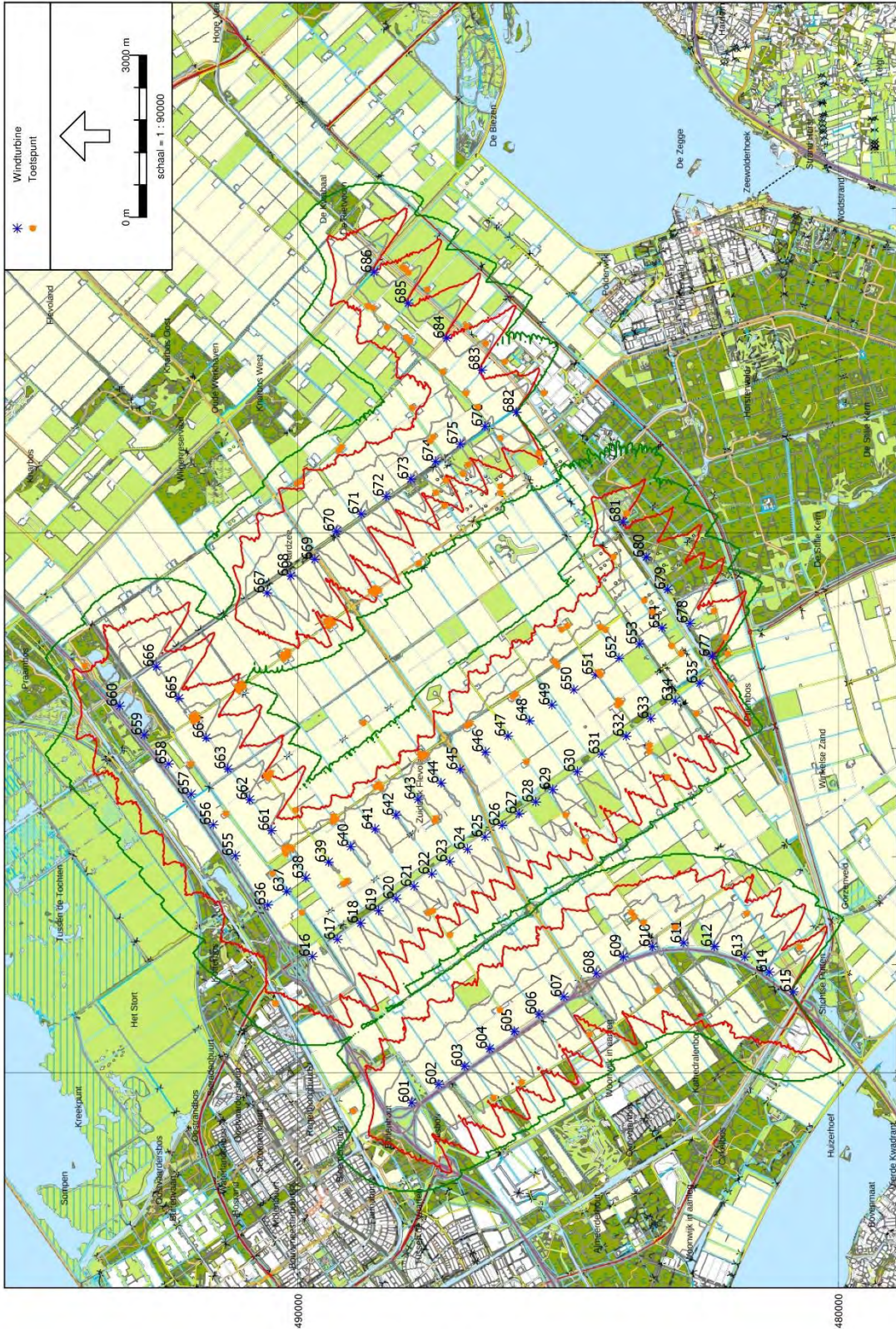
BIJLAGE 61 ALT 2A - SLAGSCHADUWCONTOUREN

Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



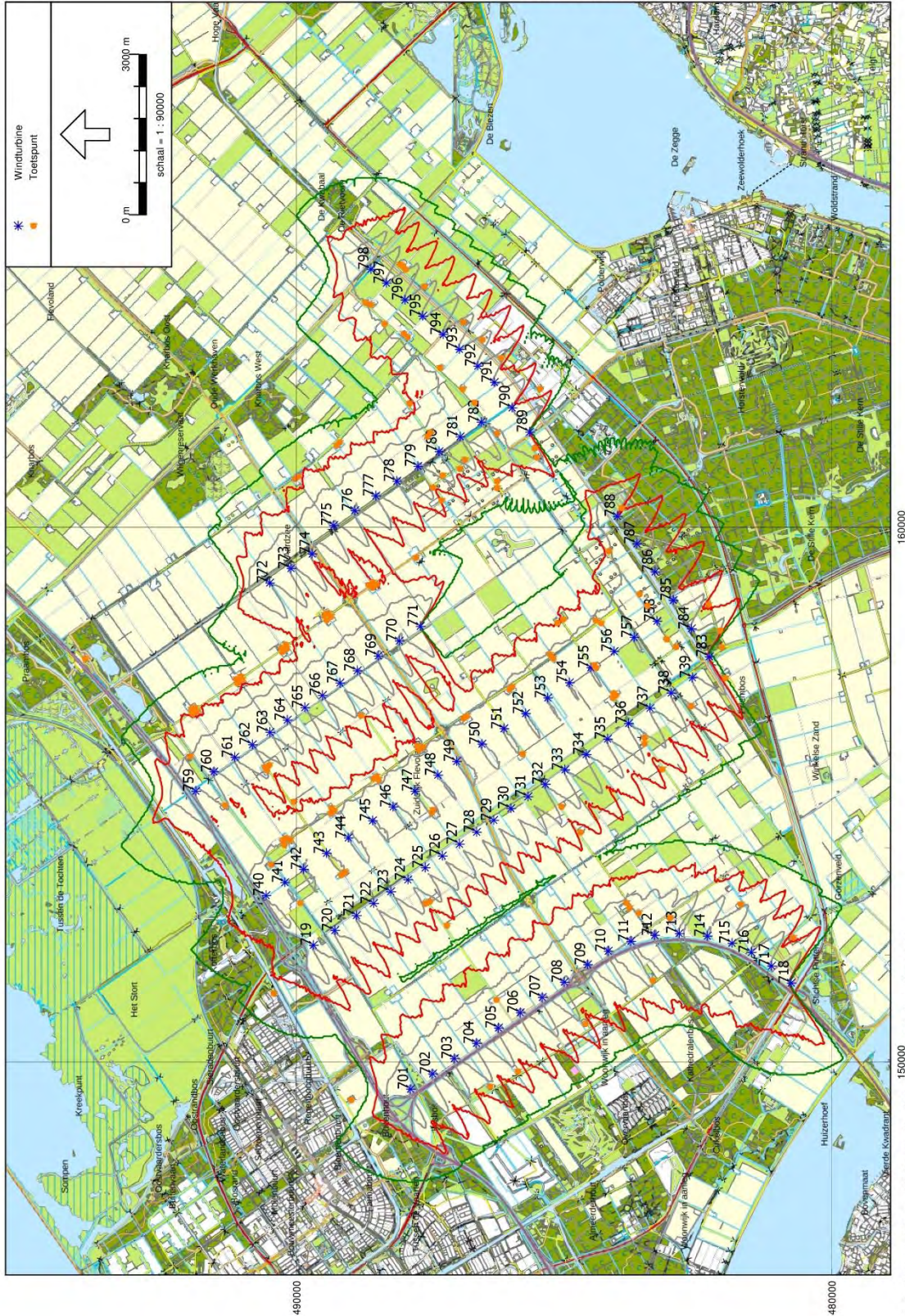
BIJLAGE 62 ALT 2B - SLAGSCHADUWCONTOUREN

Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



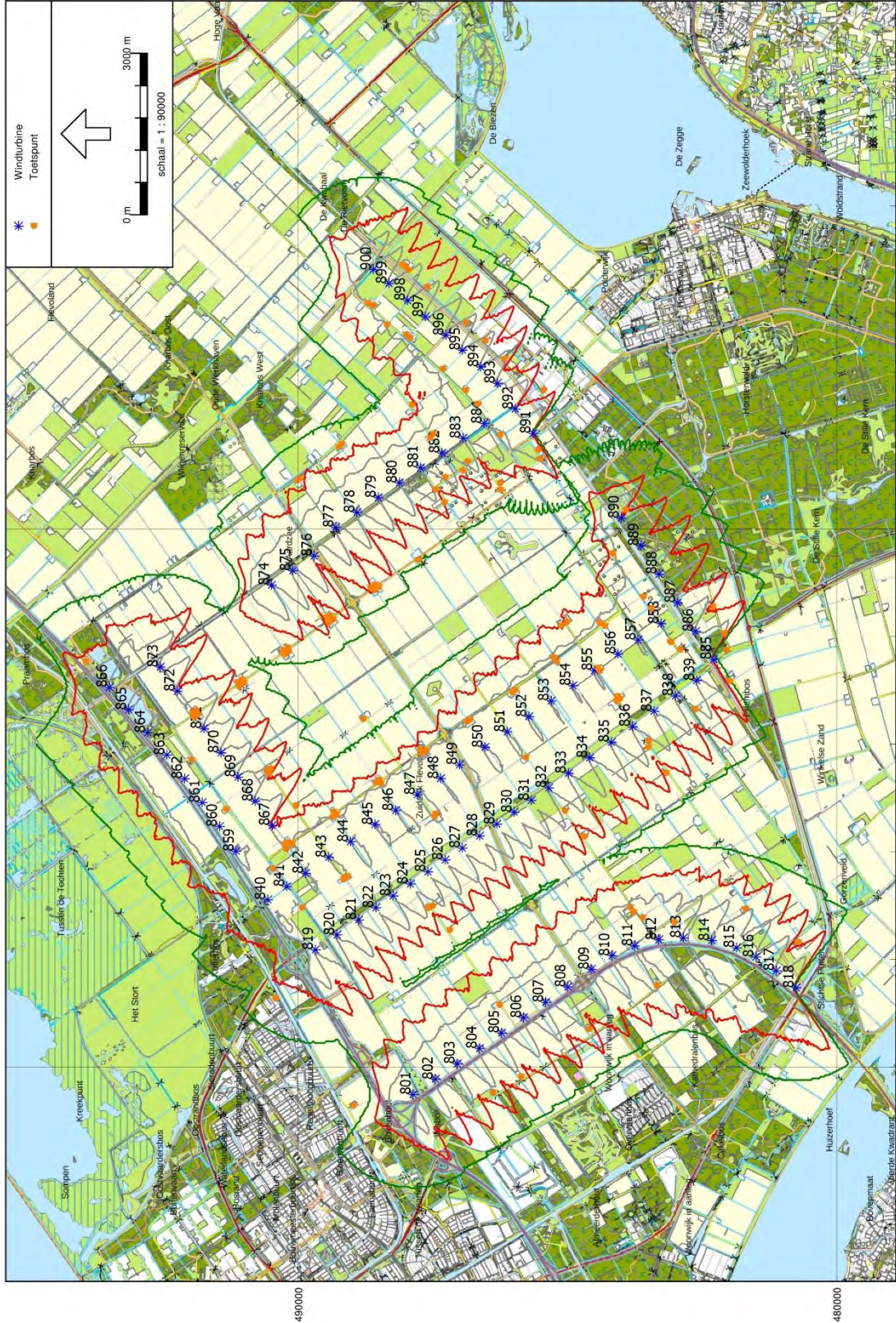
BIJLAGE 63 ALT 3A - SLAGSCHADUWCONTOUREN

Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



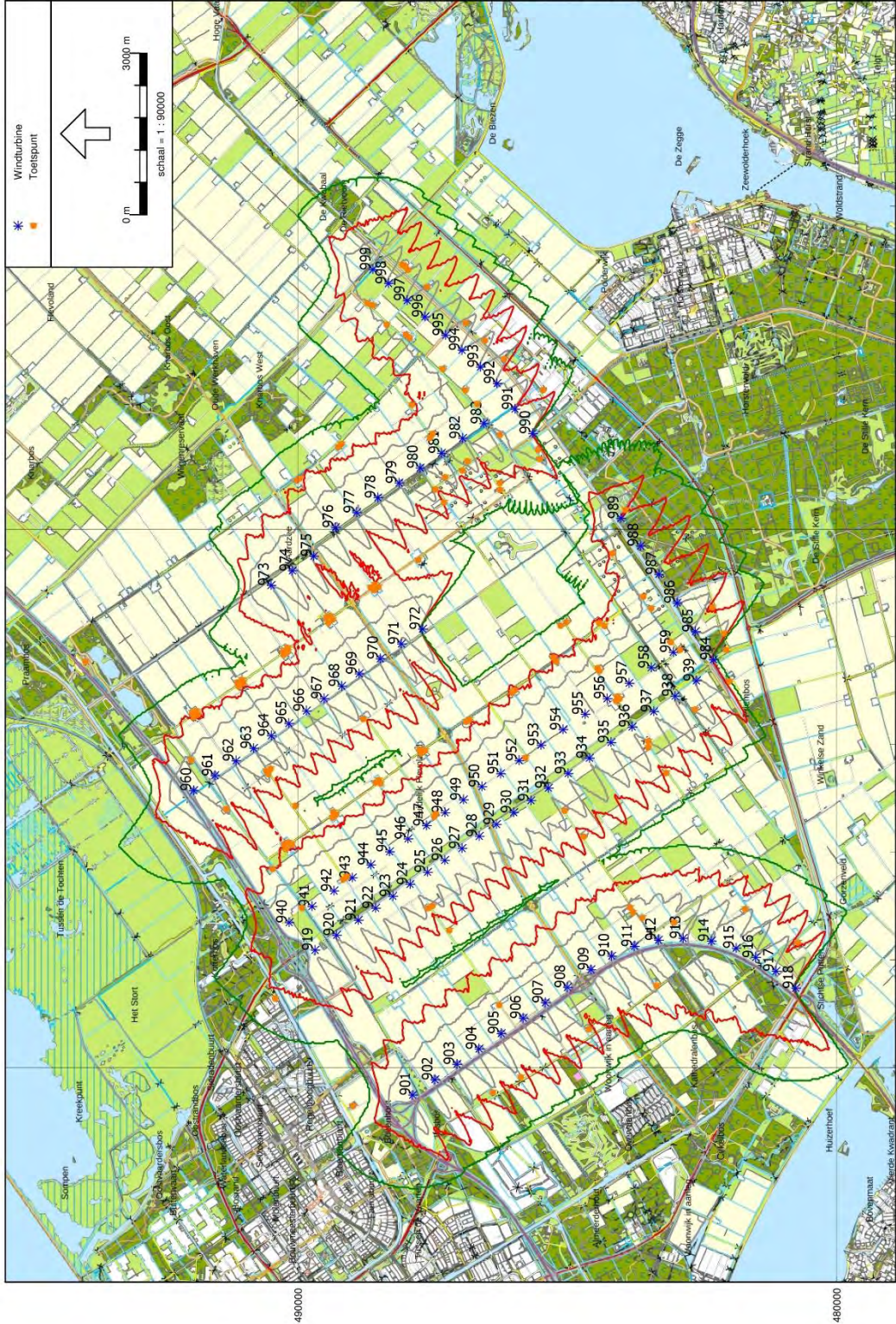
BIJLAGE 64 ALT 3B - SLAGSCHADUWCONTOUREN

Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



BIJLAGE 65 ALT 3C - SLAGSCHADUWCONTOUREN

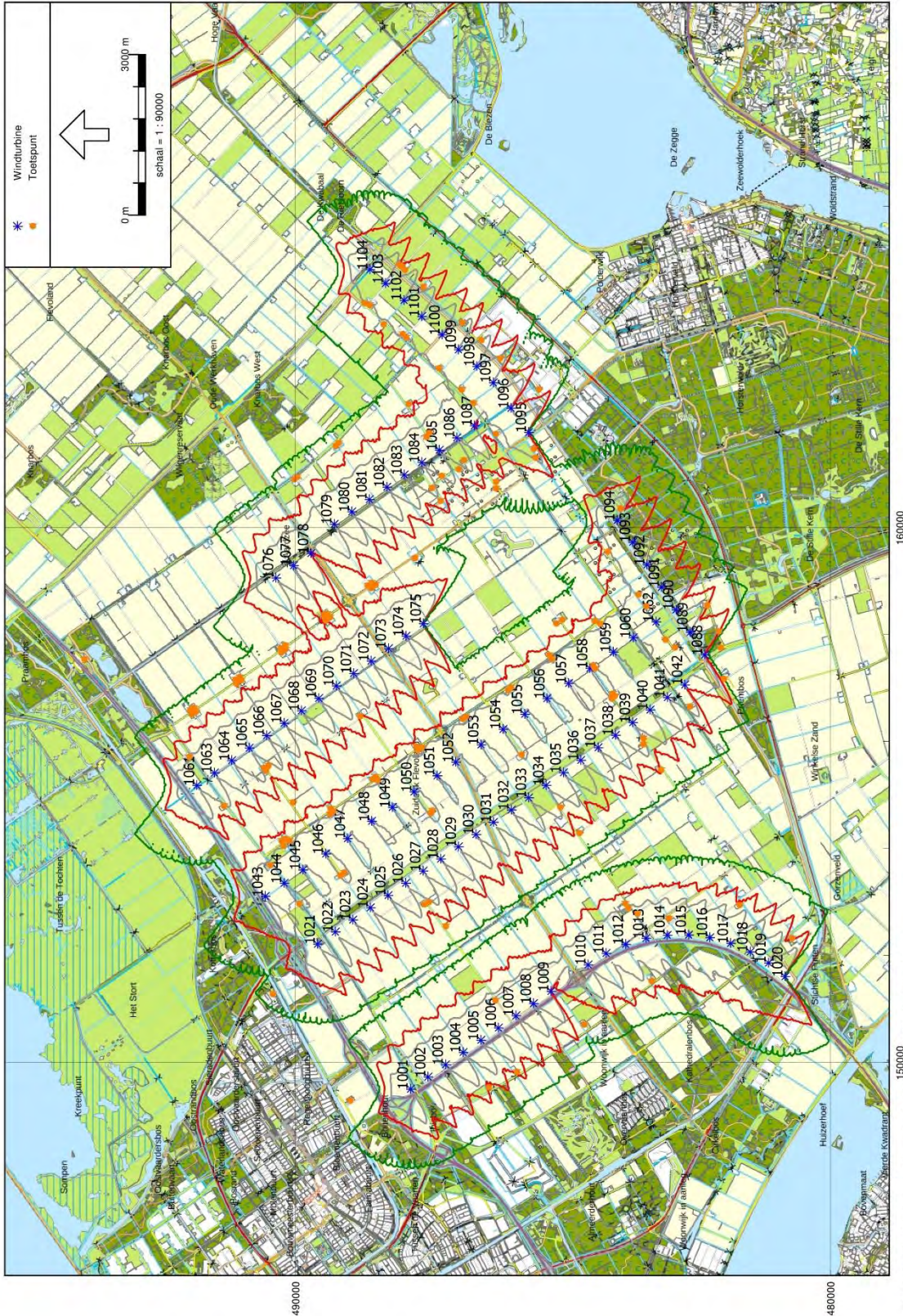
Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



150000
160000
Industrielewaai - WT, [maart 2016 - versie 1 V117.3.45 (mai STE)], Geonilieu V3.11

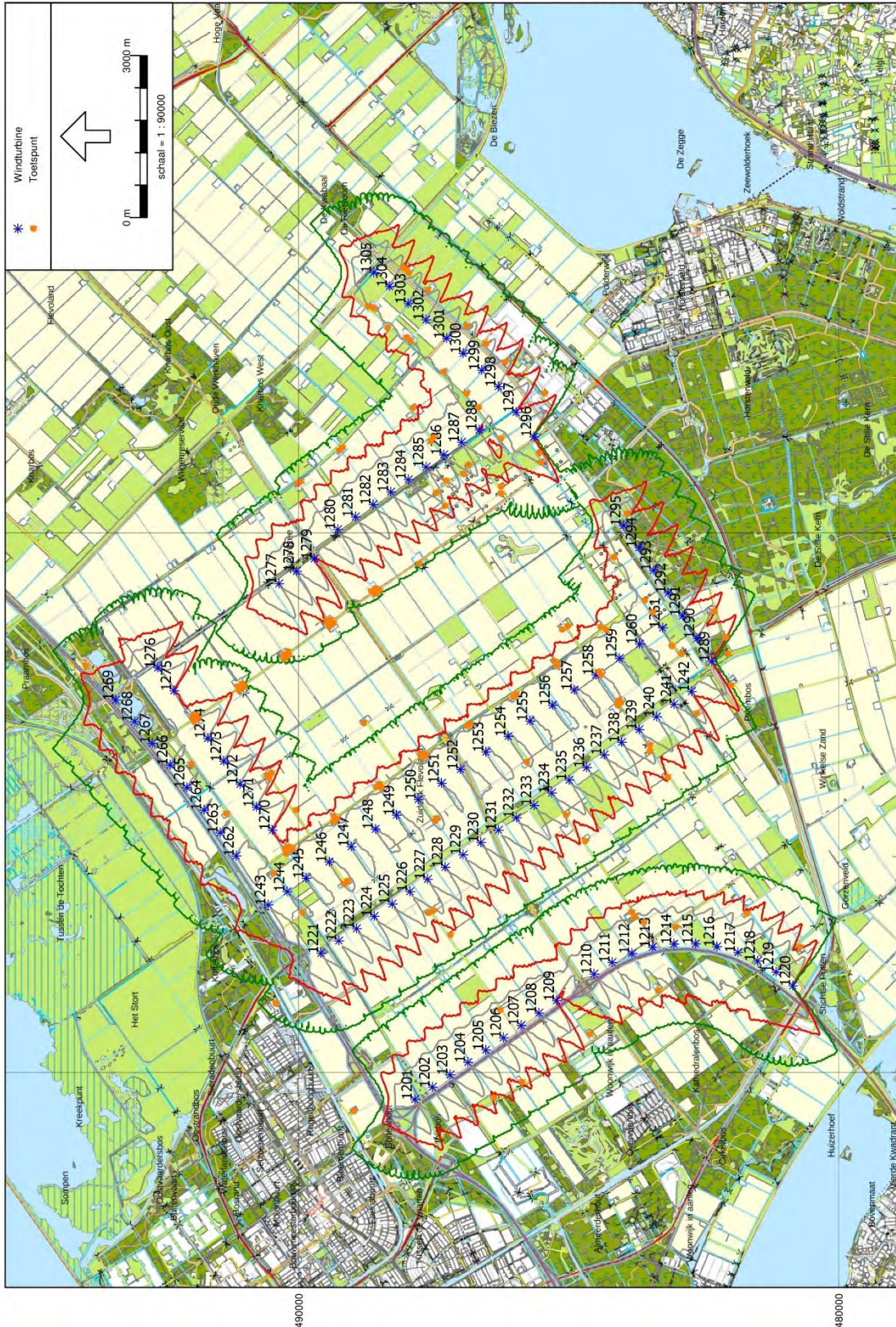
BIJLAGE 66 ALT 4A - SLAGSCHADUWCONTOUREN

Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



BIJLAGE 67 ALT 4B - SLAGSCHADUWCONTOUREN

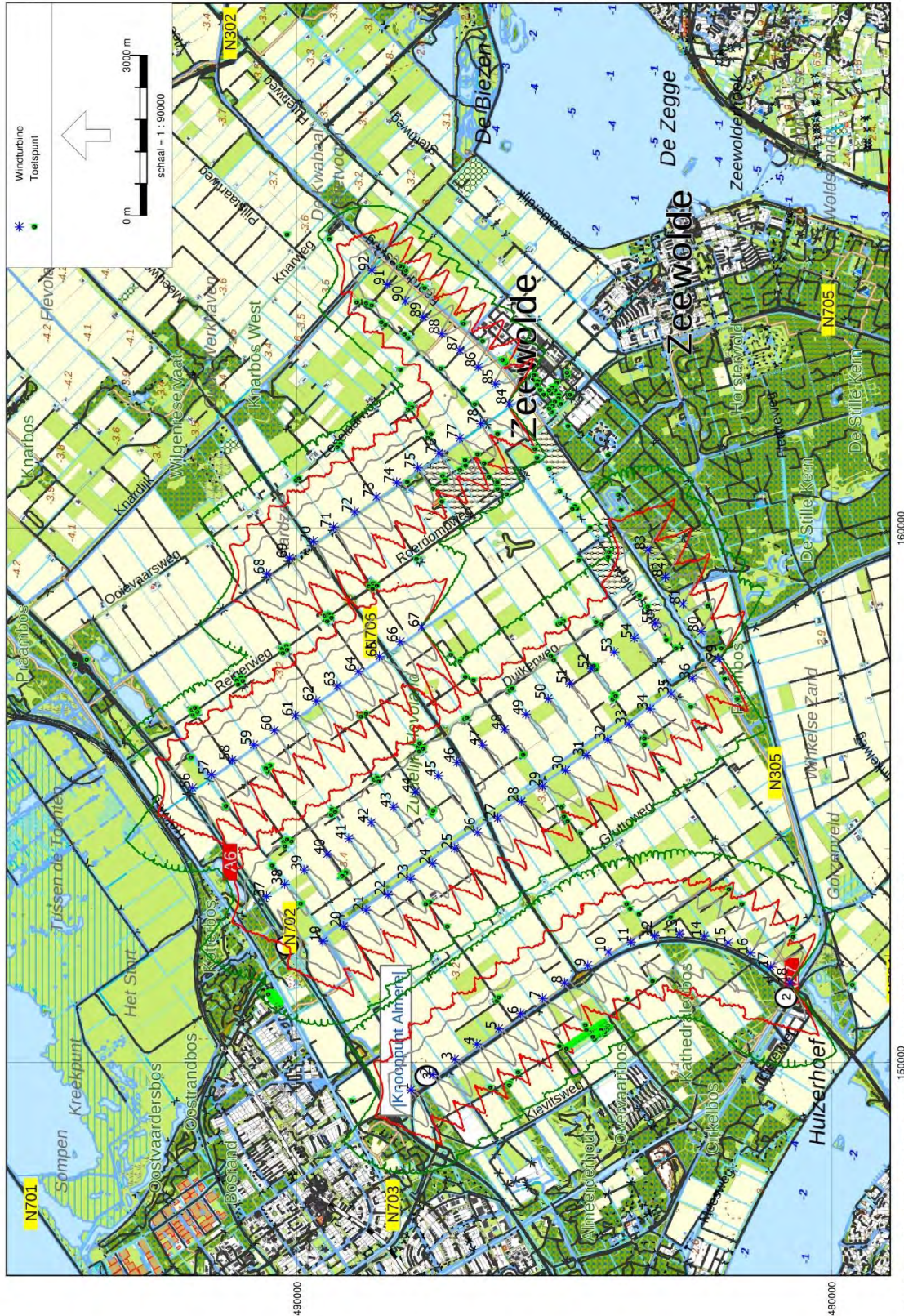
Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



BIJLAGE 68 VKA - SLAGSCHADUWCONTOUREN

VKA

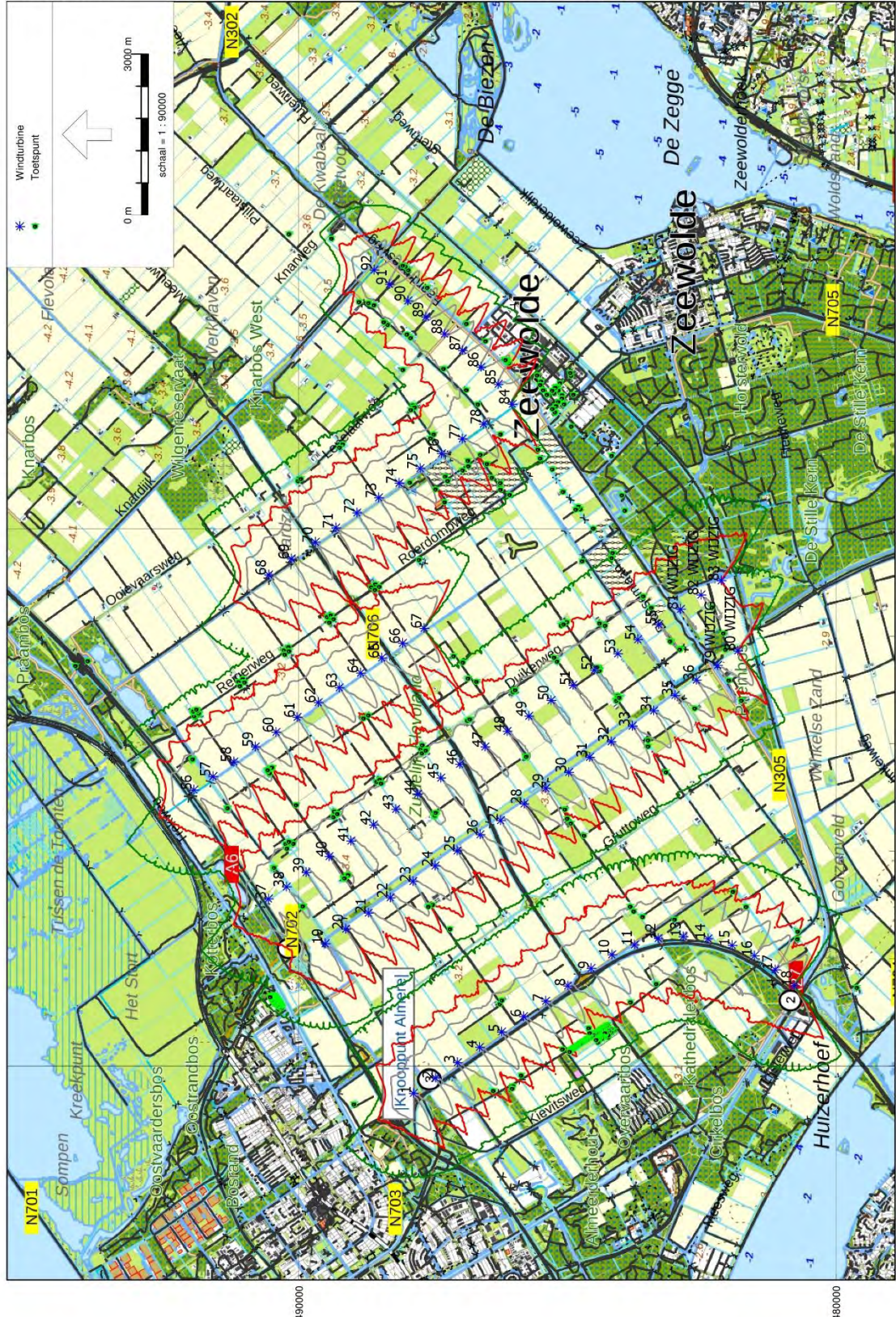
Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



BIJLAGE 69 VKA TERUGVALOPTIE - SLAGSCHADUWCONTOUREN

VKA terugvaloptie

Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar

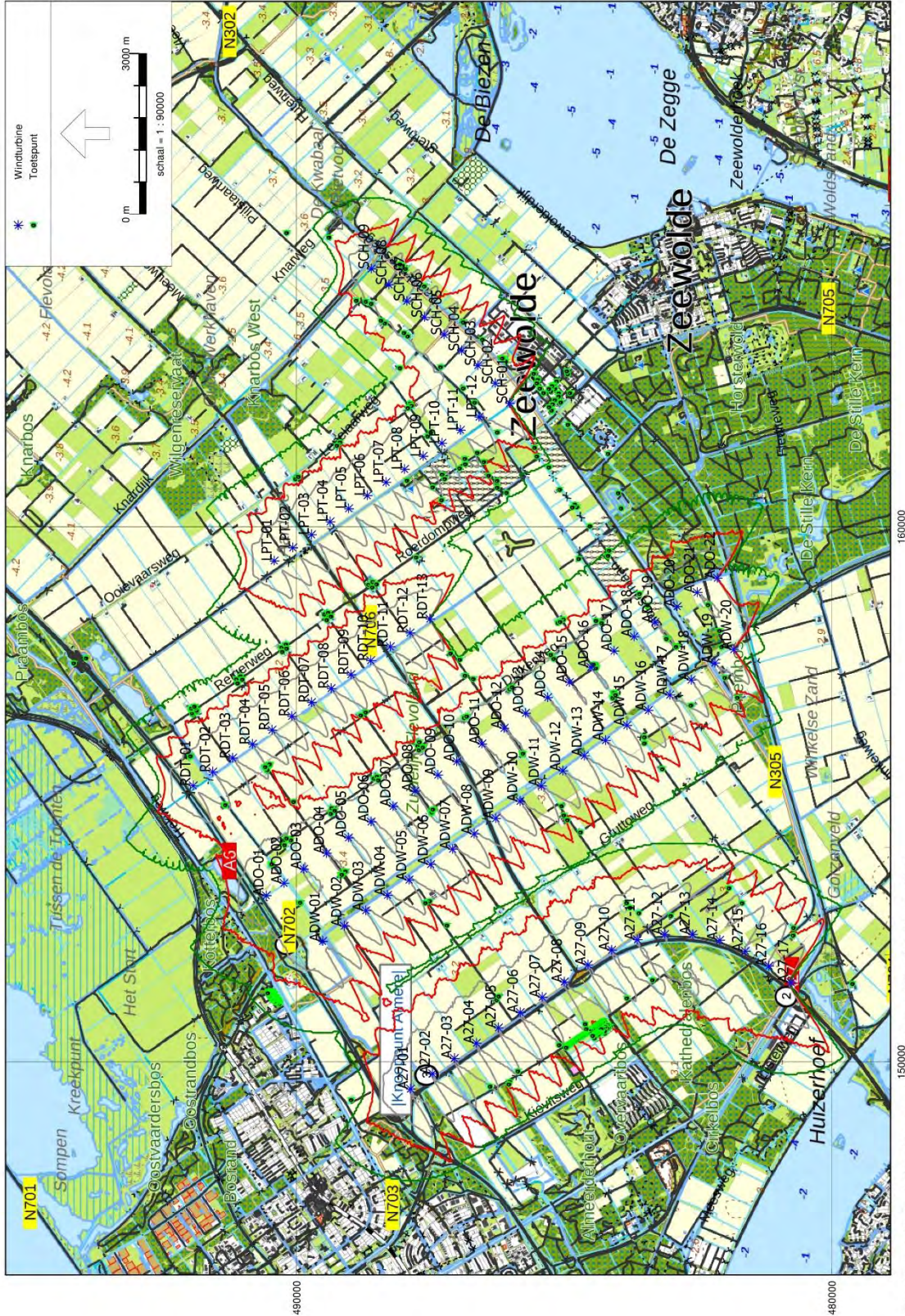


150000
160000
Industrielaan - WT, [maart 2016 - Kopie van versie 1.V117 3.45 met STE - VKA], Geomilieu V4.00

BIJLAGE 70 VKA-HOOG - SLAGSCHADUWCONTOUREN

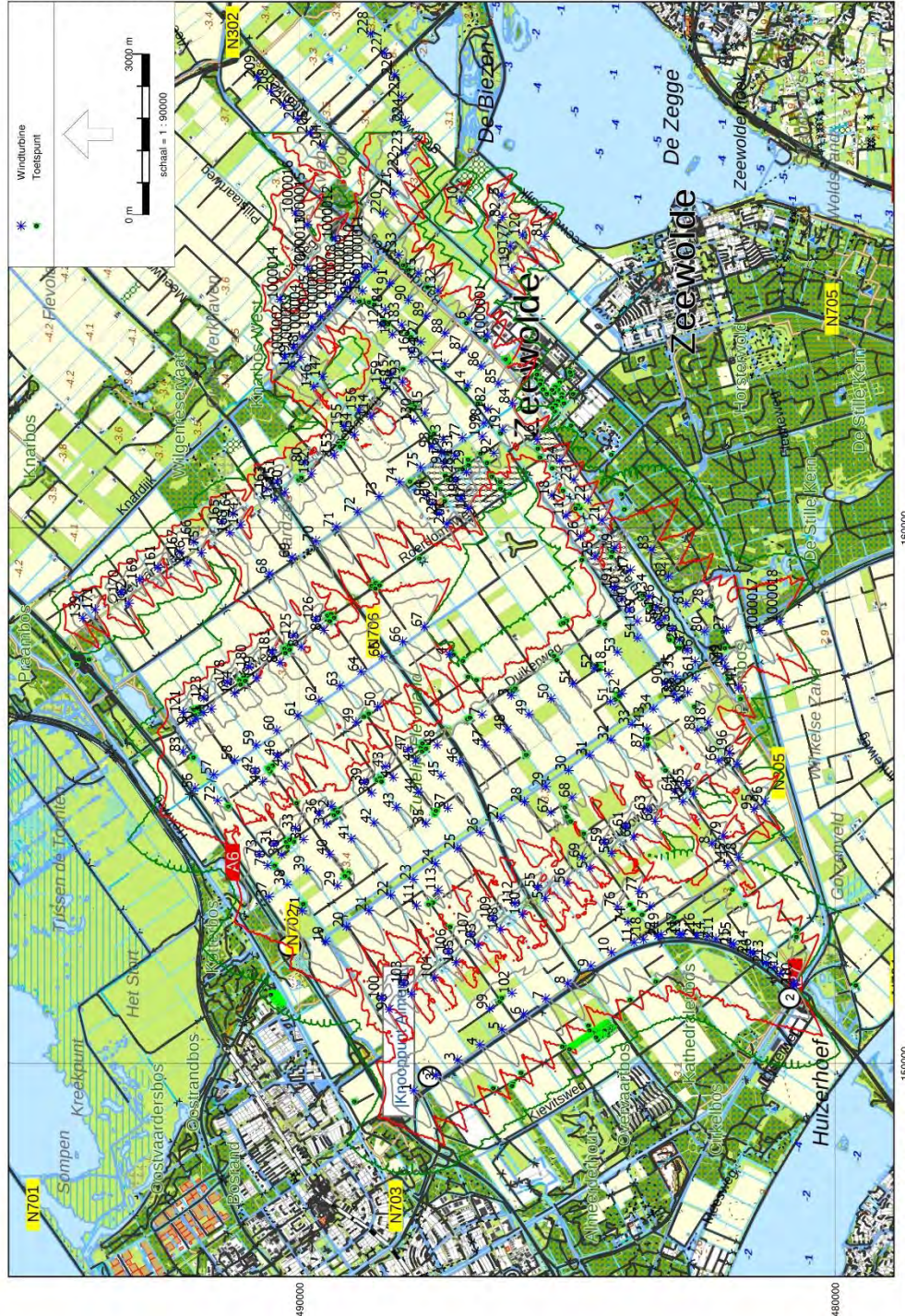
VKA-hoog

Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



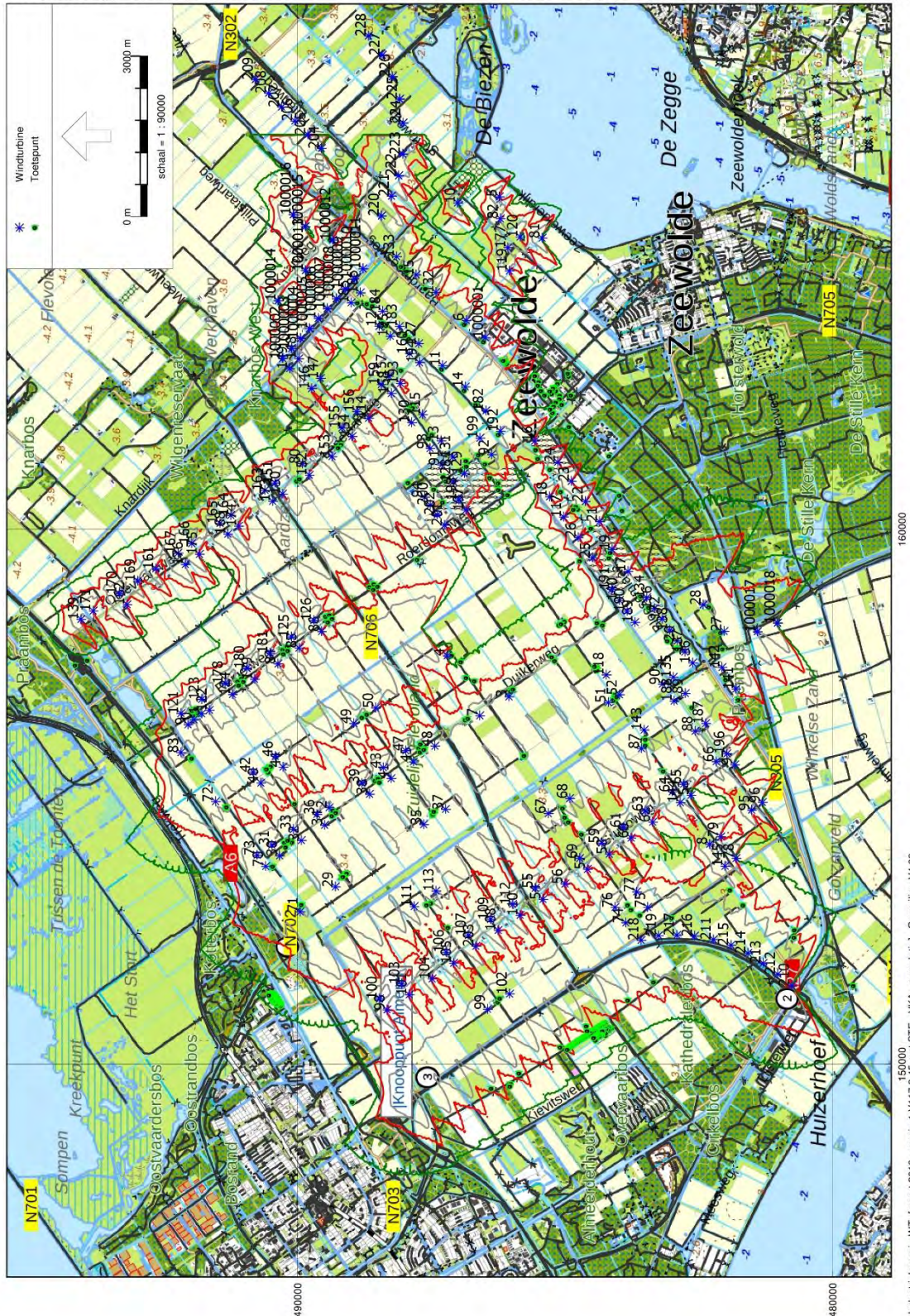
BIJLAGE 71 VKA – SLAGSCHADUWCONTOUREN CUMULATIEF DUBBELDRAAIERPERIODE

VKA cumulatie dubbeldraai Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



BIJLAGE 72 VKA TERUGVALOPTIE – SLAGSCHADUWCONTOUREN CUMULATIEF DOUBBELDRAAI

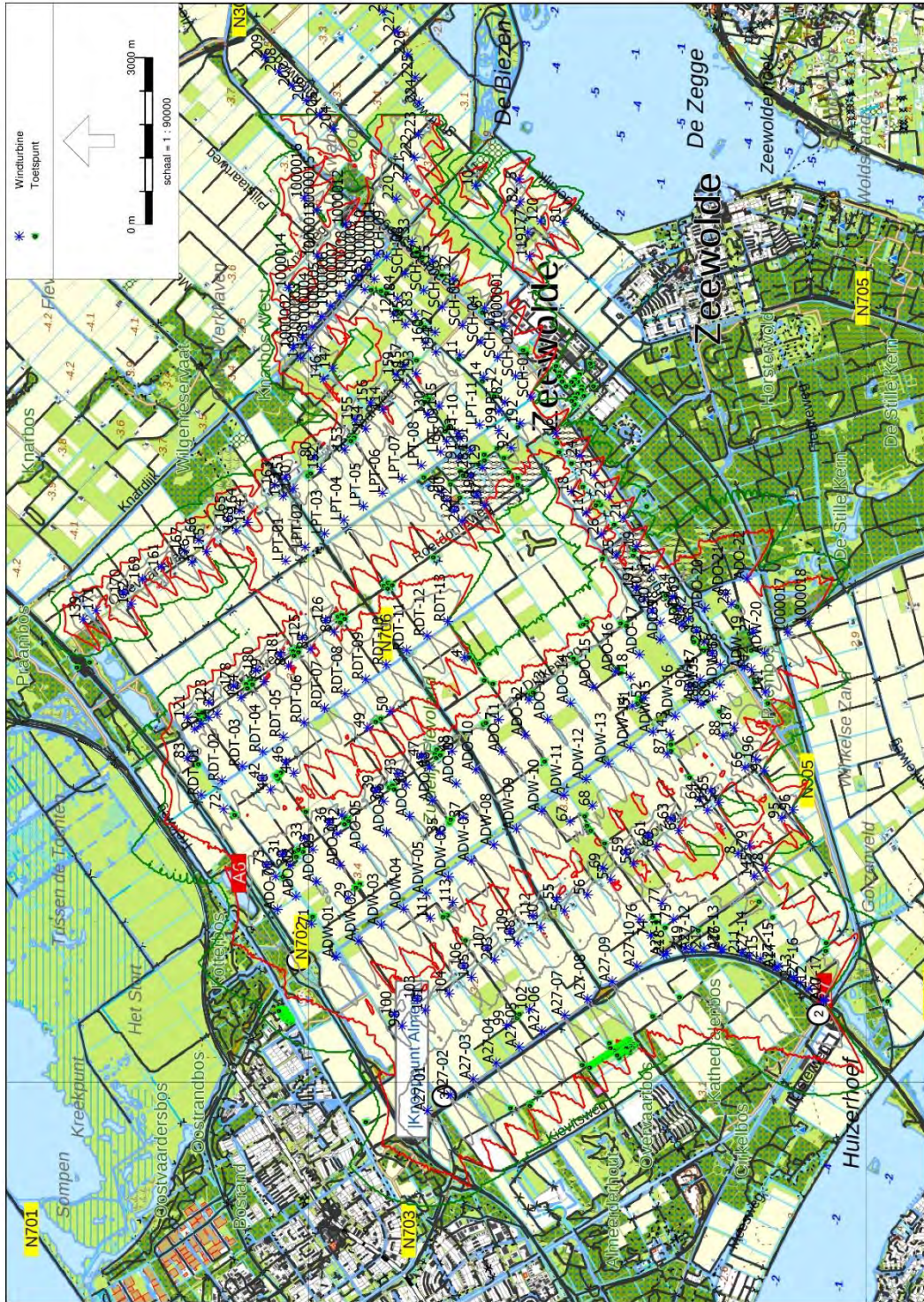
VKA terugvaloptie cumulatief dubbeldraai Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



BIJLAGE 73 VKA-HOOG – SLAGSCHADUWCONTOUREN CUMULATIEF DUBBELDRAAI

VKA-hoog cumulatief dubbeldraai

Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



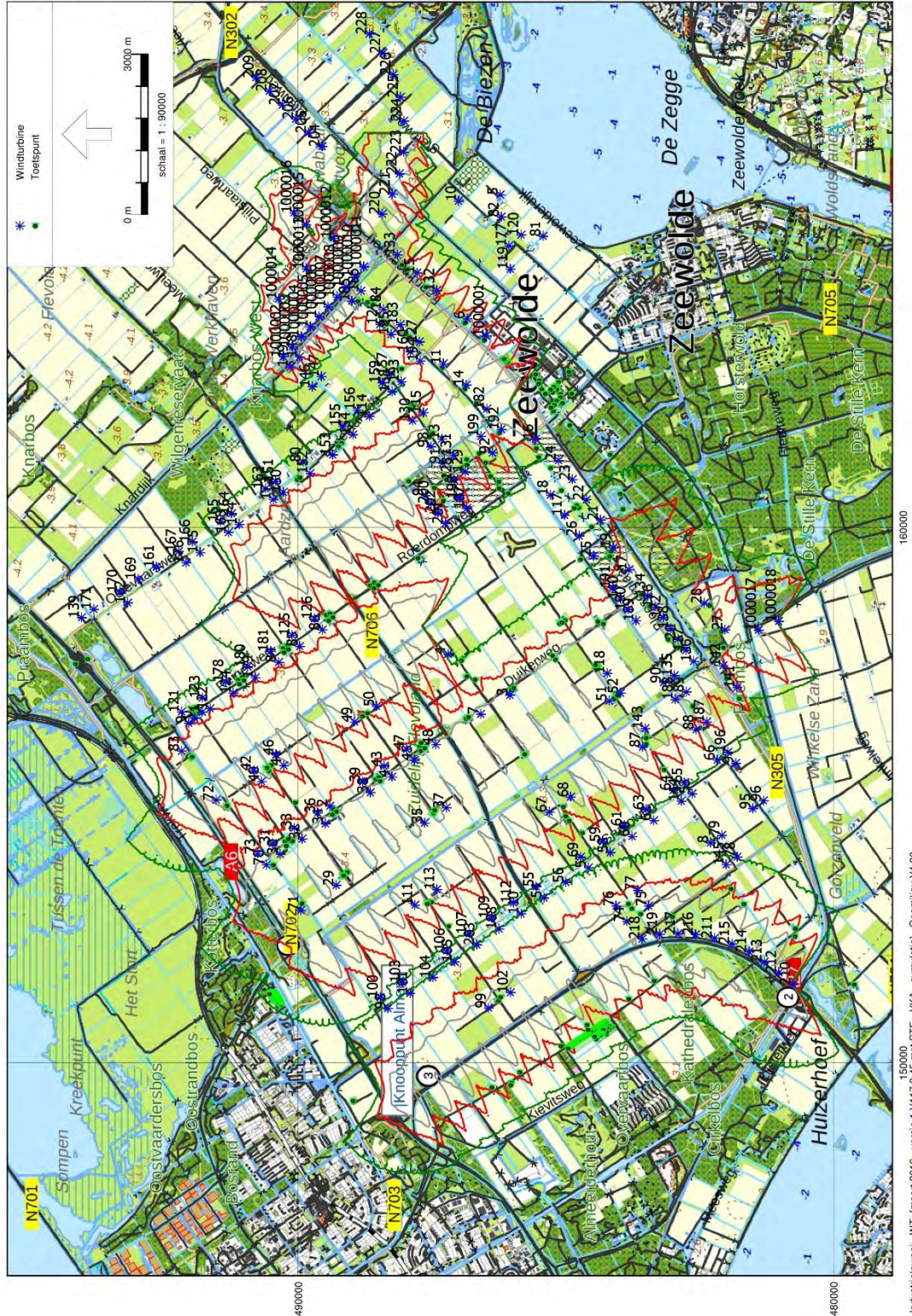
480000

480000

150000
160000
Industrielaawaai - WT, (maart 2016 - versie 1 V117 3,45 met STE - VKA - cumulatief) | Geomilieu V4.00

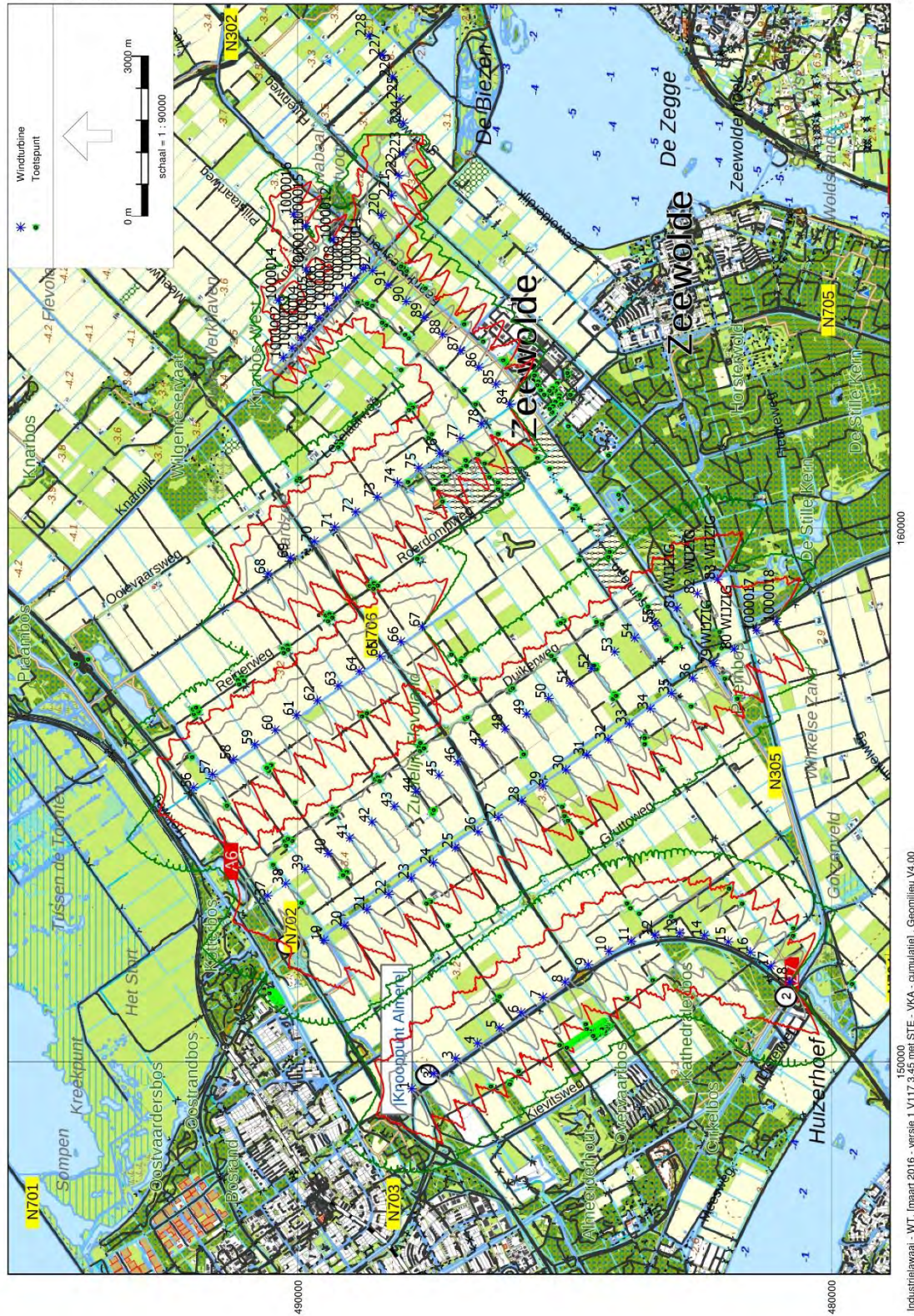
BIJLAGE 74 VKA – SLAGSCHADUWCONTOUREN CUMULATIEF NA DUBBELDRAAIERPERIODE

VKA cumulatief toekomst Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



BIJLAGE 75 VKA TERUGVALOPTIE – SLAGSCHADUWCONTOUREN CUMULATIEF NA DUBBELDRAAIPERIODE

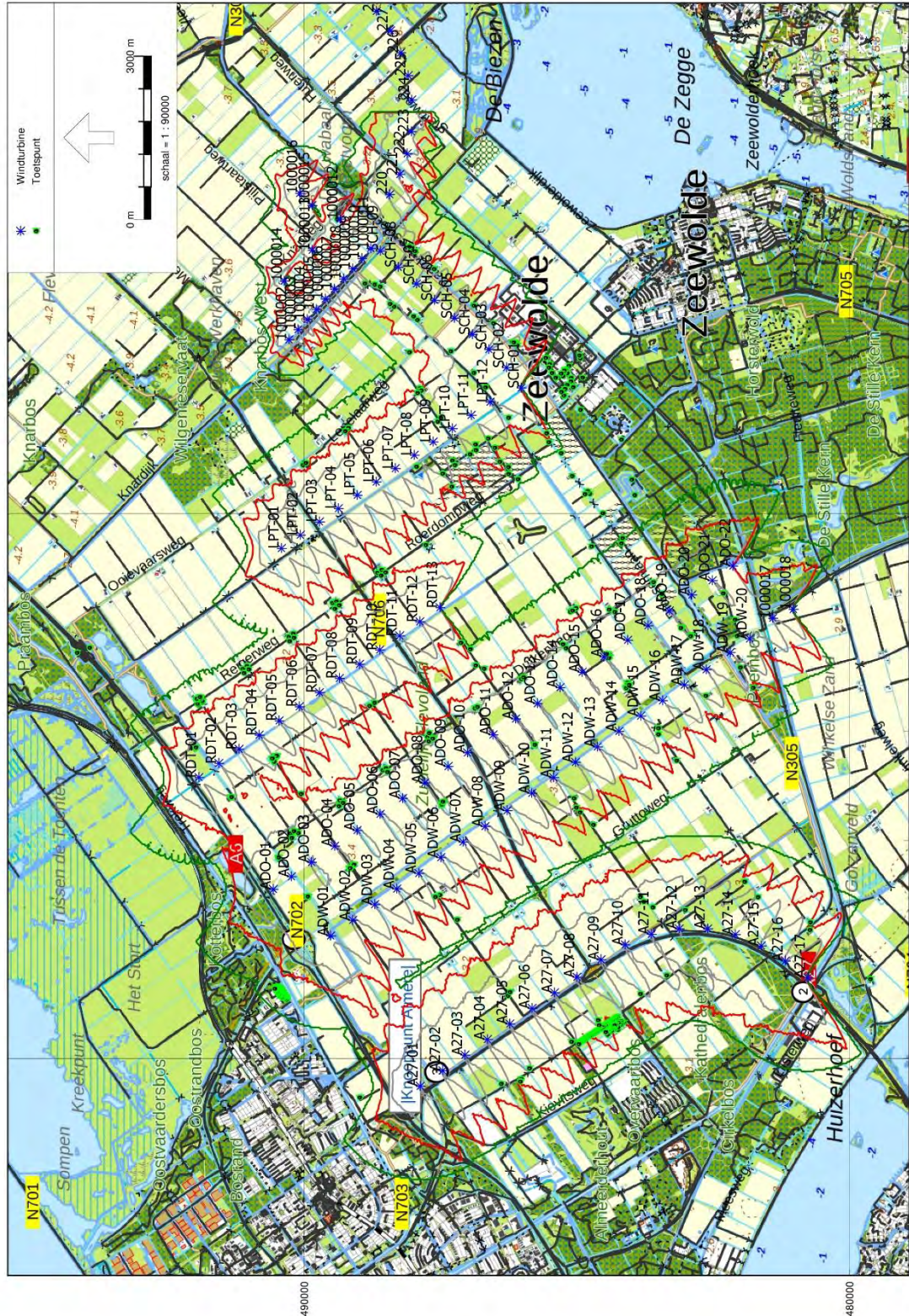
VKA terugvaloptie cumulatief toekomst Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



BIJLAGE 76 VKA-HOOG – SLAGSCHADUWCONTOUREN CUMULATIEF NA DUBBELDRAAIPERIODE

VKA-hoog cumulatief toekomst

Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



BIJLAGE 3B – NOTITIE GELUID
TRANSFORMATORSTATION



GELUIDZONERING TRANSFORMATORSTATION

WINDPARK ZEEWOLDE

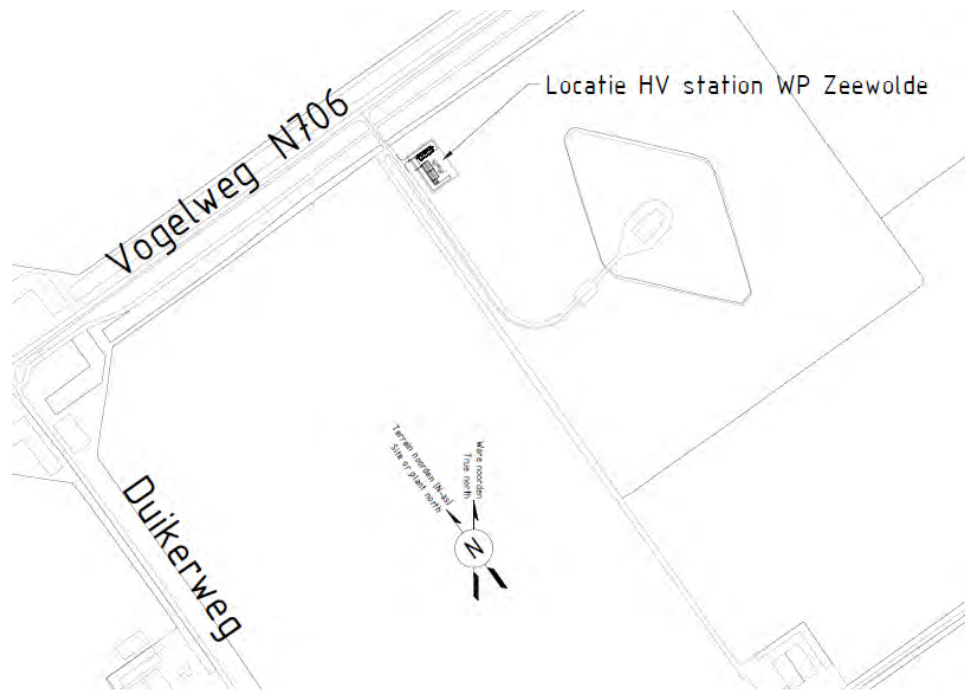
Datum	29 september 2016
Van	D.F. Oude Lansink
Betreft	Geluidzonering transformatorstation Windpark Zeewolde
Projectnummer	715027

Inleiding

Nabij de Middengolfzender Flevoland zal ten behoeve van de realisatie van het windpark Zeewolde een transformatorstation worden gebouwd. In het transformatorstation wordt de opgewekte elektriciteit van de windturbines (33 kV) getransformeerd naar een hoger spanningsniveau (150 kV) waardoor aansluiting op het elektriciteitsnet mogelijk wordt.

Het transformatorstation betreft een open station met twee 150/33kV-transformatoren welke worden opgesteld in de buitenlucht. De transformatoren zullen tevens aan drie zijden worden omgeven door 6 meter hoge scherfmuren. De exacte locatie van de transformatoren op het terrein en de locatie, hoogte en oriëntatie van de scherfmuren kunnen variëren afhankelijk van de detailplanning in de toekomst.

Figuur 1: Locatie transformatorstation WP Zeewolde



Normering

Omdat het transformatorstation een elektrisch vermogen heeft van meer dan 200 MVA geldt er een geluidzoneringsplicht conform het Inrichtingen- en vergunningenbesluit milieubeheer in het kader van de Wet geluidhinder. Het terrein waarop het transformatorstation wordt gerealiseerd dient daarom in het ruimtelijk plan te worden aangemerkt als een gezoneerd industrieterrein. Rondom dit terrein dient vervolgens, conform artikel 40 van de Wet geluidhinder (Wgh) een zone te worden vastgesteld waarbuiten de geluidbelasting vanwege dat terrein de waarde van 50 dB(A) niet mag overschrijden. Geluid van transformatoren is mogelijk tonaal, waarvoor een straf toeslag van 5 dB dient te worden opgeteld bij de geluidbelasting. In het navolgende wordt hier worst-case vanuit gegaan.

Uitgangspunten berekening

Voor de transformatoren is uitgegaan van een uitsnede van het rekenmodel met dezelfde invoergegevens als dat voor de berekeningen van de geluidbelasting door windturbines (zie geluidrapporten bij de MER en de vergunningaanvraag voor windpark Zeewolde). De berekeningen zijn uitgevoerd conform de rekenmethode industrielawaai in het rekenpakket Geomilieu versie V4.00.

De transformatoren zijn ingevoerd als twee puntbronnen met een basis-geluidemissie van 87 dB(A) als worst-case aanname, beide met een bedrijfsduur van 100% gedurende het gehele etmaal. Het hele terrein rondom de puntbronnen is akoestisch reflecterend ingevoerd (B=0,0) evenals de wegen en wateren en andere

terreinen. De standaardbodemabsorptie is ingesteld op $B = 0,9$ (absorberend, wegens onverharde gebieden).

Als worst-case wordt aangenomen dat door de reflectie van de schermuren de geluidemissie met 3 dB toeneemt hetgeen overeenkomt met een verdubbeling van het geluid bij 100% reflectie door de scherfmuren. Omdat de oriëntatie en afmetingen van de scherfmuren nog kunnen variëren, wordt er hier bij de bepaling van de zone vanuit gegaan dat deze toename in alle richtingen plaatsvindt (in model door beide geluidbronnen met 3 dB te verhogen).

Op grond van de Handleiding Meten en Rekenen Industrielawaai dient bij een hoorbaar tonaal karakter een straffactor van 5 dB(A) te worden toegepast. Daarom zijn de geluidbronemissies nog eens met een extra 5 dB verhoogd om deze mogelijk noodzakelijke straftoeslag te verdisconteren.

In Bijlage 1 staan de invoergegevens van het rekenmodel weergegeven. In bijlage 2 staan de rekenresultaten weergegeven.

Rekenresultaten en geluidzone

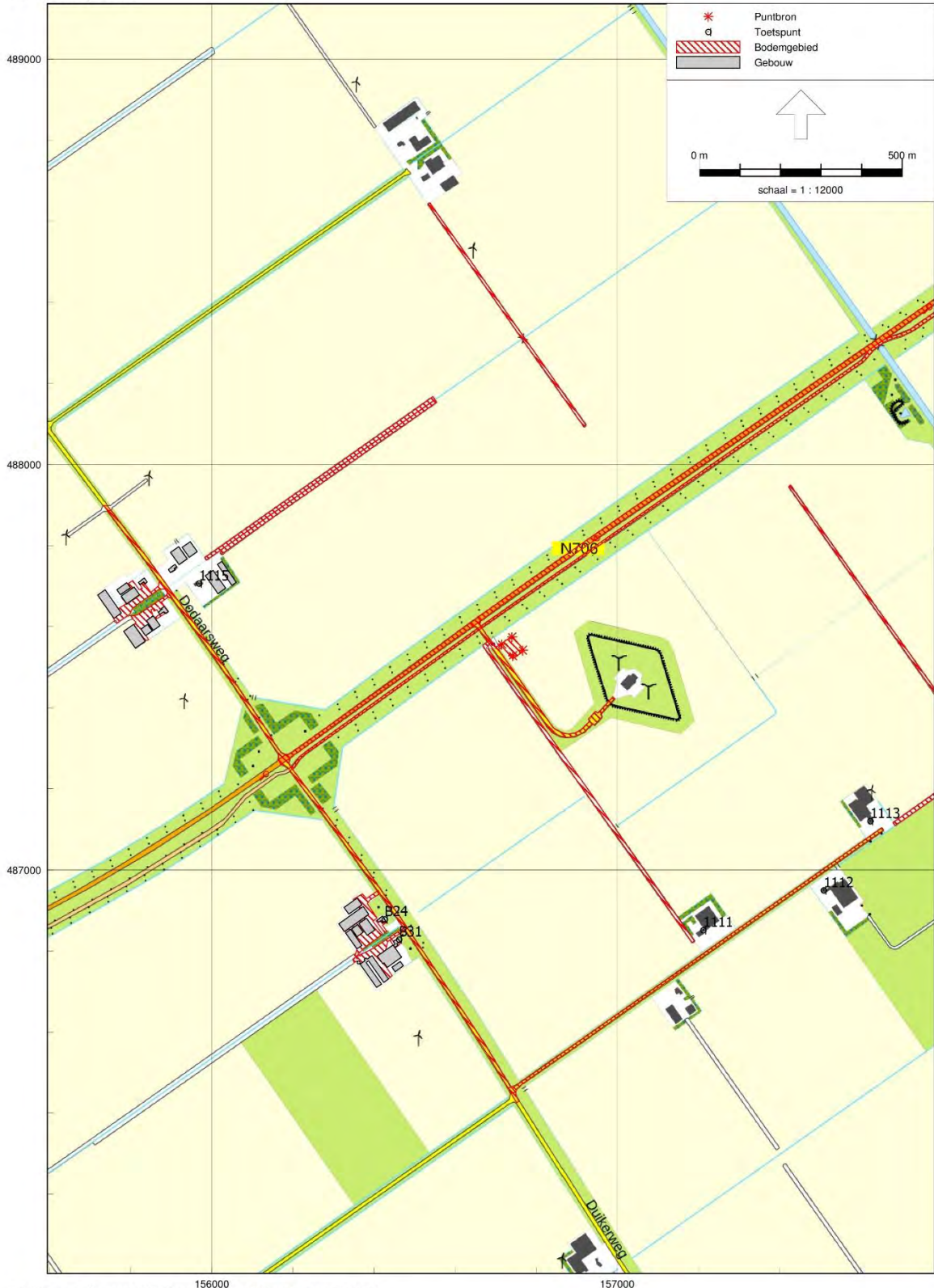
Ter plaatse van de dichtstbijgelegen geluidgevoelige bestemmingen veroorzaakt het transformatorstation een geluidbelasting van maximaal 34 dB(A) etmaalwaarde. Daarmee wordt ruim voldaan aan de voorkeursgrenswaarde van 40 dB(A) etmaalwaarde welke in een stil landbouwgebied conform de voorkeursgrenswaarden/richtwaarden uit tabel 4 van de Handleiding Industrielawaai en vergunningverlening. Hierbij is de straffactor van 5 dB(A) wegens tonaliteit zoals eerder genoemd reeds in de geluidbron verdisconteerd.

De 50 dB(A) contouren op grond van bovengenoemde aannames zijn berekend voor de puntbronnen op de vier hoeken van het terrein. Om deze contouren is een omhullende 50 dB(A) contour bepaald. Deze is weergegeven in Bijlage 3. De omhullende contour is geschikt om de geluidzonerings voor het transformatorstation in het inpassingsplan vast te leggen.

Bijlage 1: invoergegevens berekening

Transformator
3 aug 2016, 13:54

Pondera Consult



Industrielaawai - IL, [maart 2016 - Transformator - geluidzone], Geomilieu V4.00



Rekenraster

Id	Omschr.	X	Y	Hoogte	Maaiveld	DeltaX	DeltaY	X-aantal	Y-aantal
1	rekeningrid	156422,24	488337,67	5,00	0,00	10	10	209	190

Rekenpunten (woningen)

Naam	Omschr.	X	Y	Hoogte
B24	Duikerweg 2	156425,94	486878,52	5,00
B31	Duikerweg 6	156461,12	486828,52	5,00
1111	Duikerweg 5	157211,00	486852,00	5,00
1112	Duikerweg 13	157508,00	486950,00	5,00
1113	Duikerweg 9	157623,00	487121,00	5,00
1115	Dodaarsweg 53	155968,00	487707,00	5,00

Bodemgebieden

Naam	Omschr.	X-1	Y-1	Bf
41	terreinverharding	156416,38	486882,36	0,00
42	terreinverharding	156447,80	486823,51	0,00
43	terreinverharding	156409,93	486949,35	0,00
44	terreinverharding	156351,29	486771,70	0,00
45	terreinverharding	155871,17	487715,43	0,00
46	terreinverharding	155800,25	487626,16	0,00
B100	hard terrein trafostation	156715,01	487559,03	0,00
regionale	Dodaarsweg Vogelweg	156192,35	487274,90	0,00
lokale weg		156669,83	487589,82	0,00
regionale	Vogelweg	156197,05	487280,30	0,00
regionale	Vogelweg	156662,35	487614,01	0,00
lokale weg		156686,68	487567,51	0,00
lokale weg		156664,89	487596,77	0,00
lokale weg	Dodaarsweg	155845,02	487763,43	0,00
lokale weg		156662,53	487600,27	0,00
lokale weg		156192,35	487251,56	0,00
lokale weg	Duikerweg	156748,89	486452,39	0,00
lokale weg	Duikerweg	156757,56	486429,69	0,00
lokale weg	Duikerweg	156737,00	486464,98	0,00
lokale weg	Duikerweg	157655,40	487097,95	0,00
overig		156769,89	488313,09	0,00
overig		157909,78	487268,12	0,00
overig		156553,81	488153,52	0,00
overig		156664,89	487596,77	0,00
overig		156550,00	488159,54	0,00
lokale weg		156706,73	487542,12	0,00
overig		157186,81	486822,90	0,00
regionale	Vogelweg	158604,31	488974,09	0,00
overig		156202,57	487251,99	0,00
lokale weg	Dodaarsweg	155742,91	487897,73	0,00
lokale weg		156992,83	487421,95	0,00
lokale weg	Duikerweg	156198,00	487248,66	0,00

Gebouwen

Naam	Omschr.	X-1	Y-1	hoogte	maaiveld	Bf
50100000	N	156000,00	487736,78	8,77	0,00	0,80
50100000	N	156049,48	487701,94	7,25	0,00	0,80
50100000	N	156362,37	486867,56	8,67	0,00	0,80
50100000	N	156344,43	486854,19	8,51	0,00	0,80
50100000	N	156373,31	486909,68	8,04	0,00	0,80
50100000	N	155833,49	487720,10	8,82	0,00	0,80
50100000	N	155892,90	487740,77	8,75	0,00	0,80
50100000	N	155898,10	487783,24	8,65	0,00	0,80
50100000	N	155946,62	487809,46	9,39	0,00	0,80
50100000	N	155776,62	487675,50	8,76	0,00	0,80
50100000	N	155882,85	487650,07	7,65	0,00	0,80
50100000	N	155853,01	487589,25	9,56	0,00	0,80
50100000	N	155758,47	487620,50	6,80	0,00	0,80
50100000	N	155872,21	487602,63	9,48	0,00	0,80