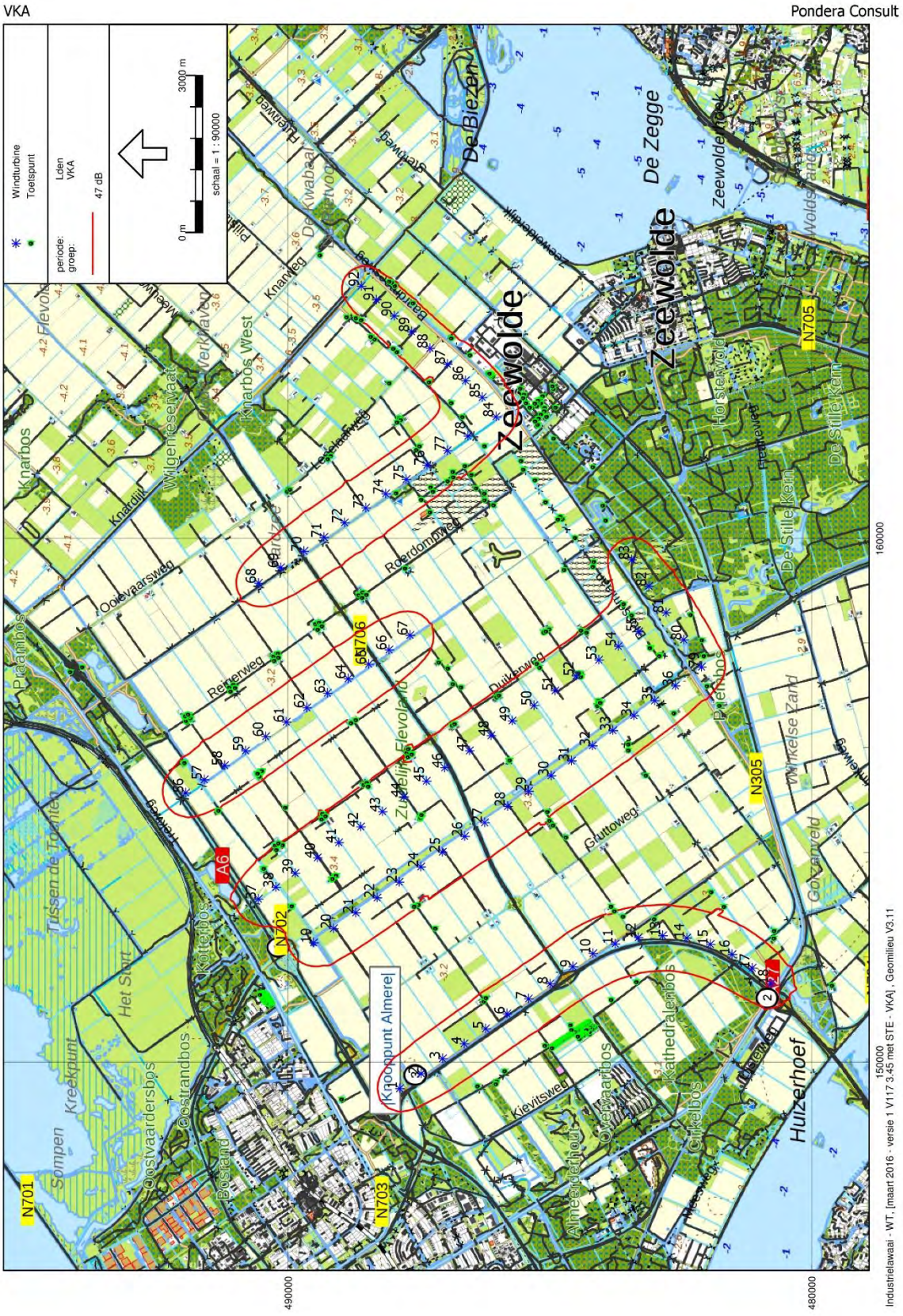
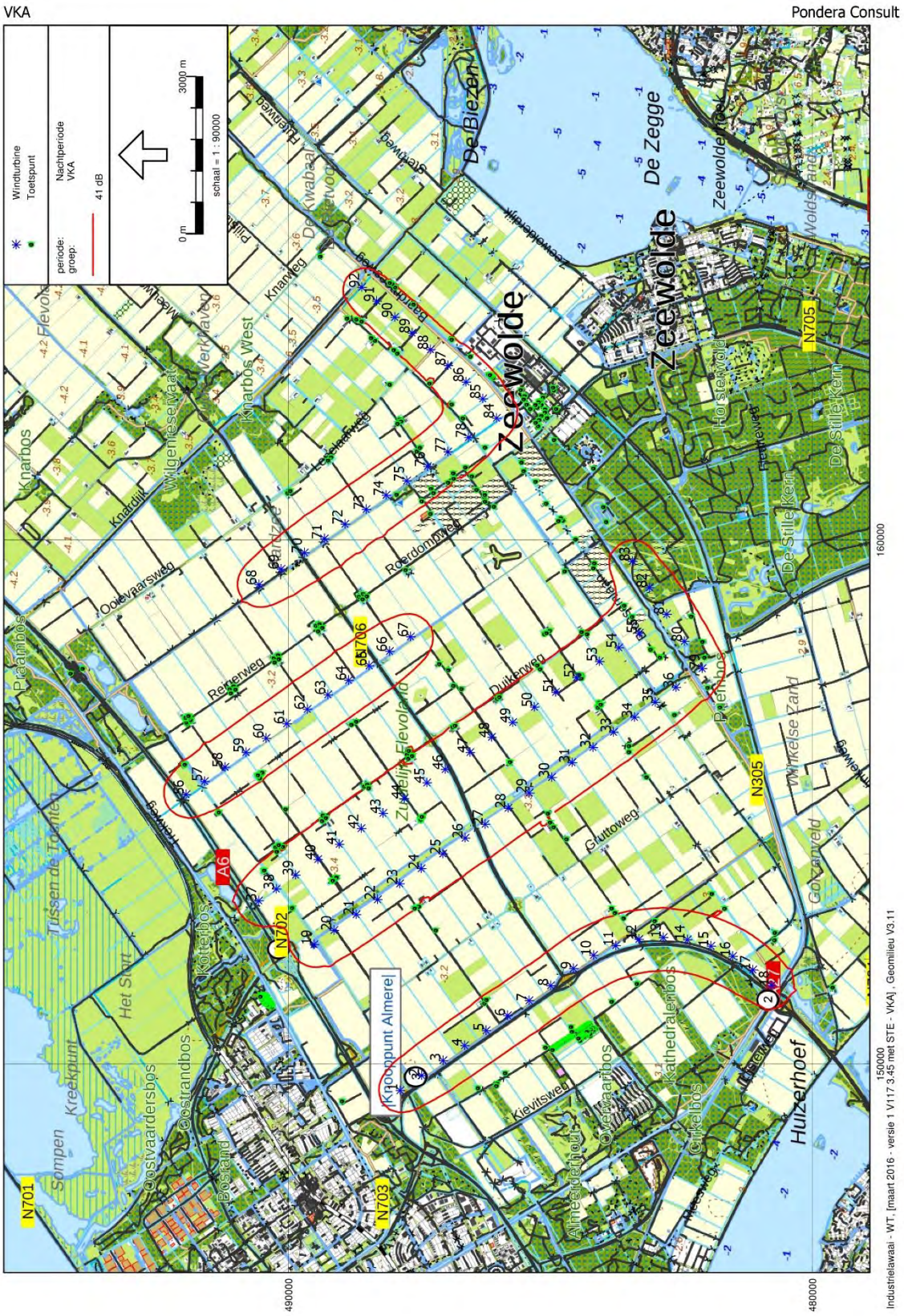
MER WINDPARK ZEEWOLDE

BIJLAGEN DEEL 2

BIJLAGE 38 VKA - GELUIDCONTOUR L_{DEN}



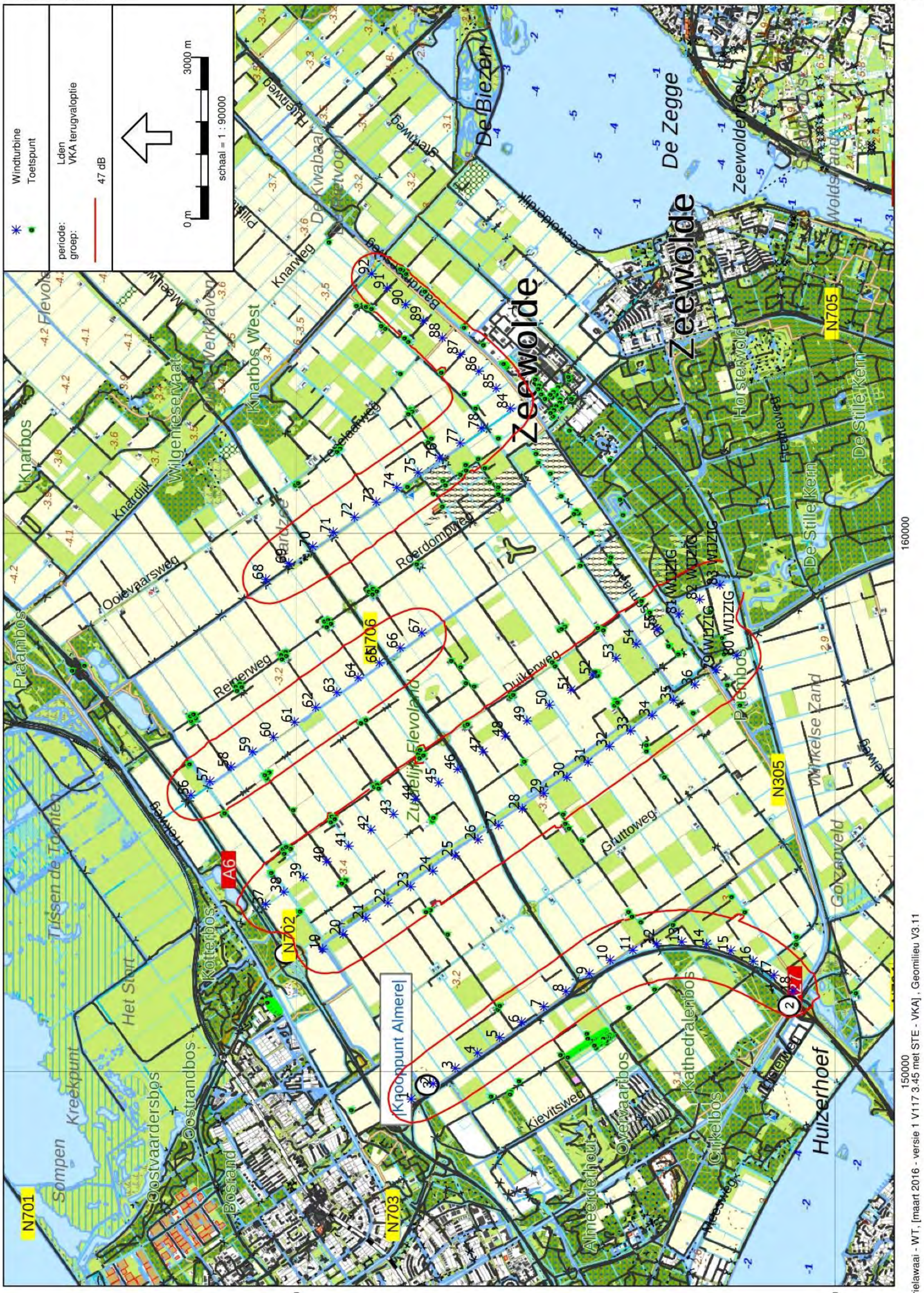
BIJLAGE 39 VKA - GELUIDCONTOUR L_{NIGHT}



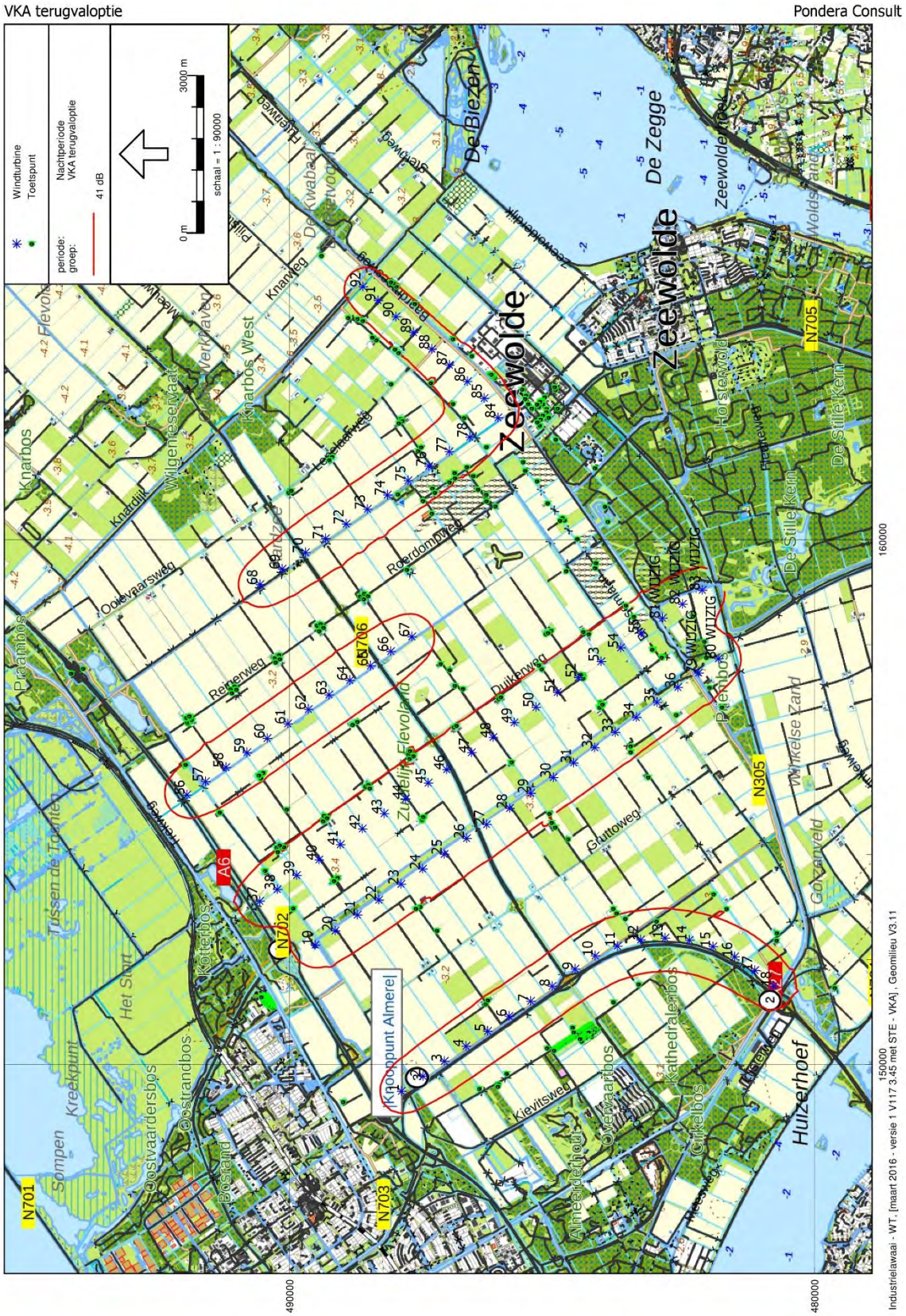
BIJLAGE 40 VKA TERUGVALOPTIE- GELUIDCONTOUR L_{DEN}

VKA terugvaloptie

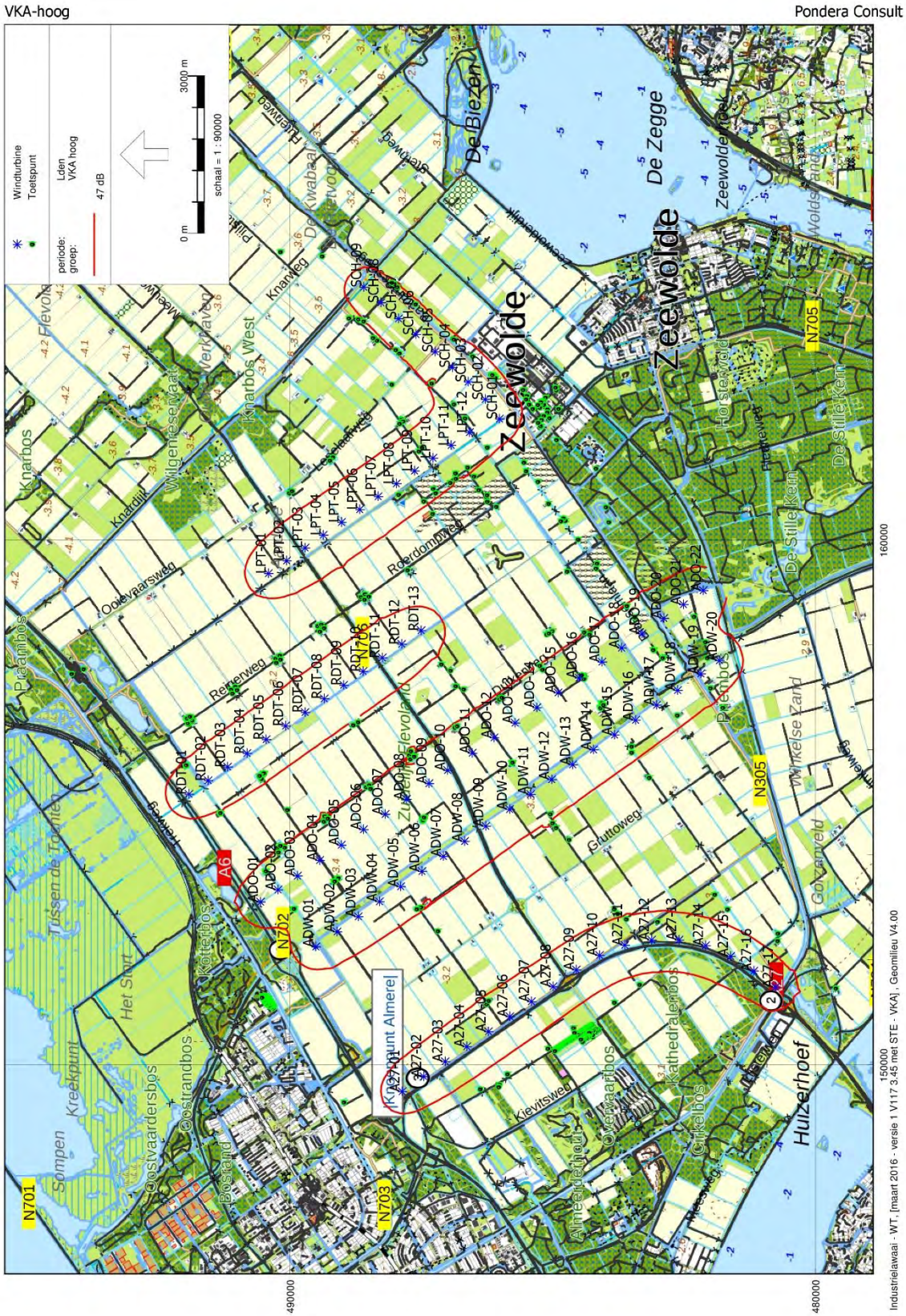
Pondera Consult



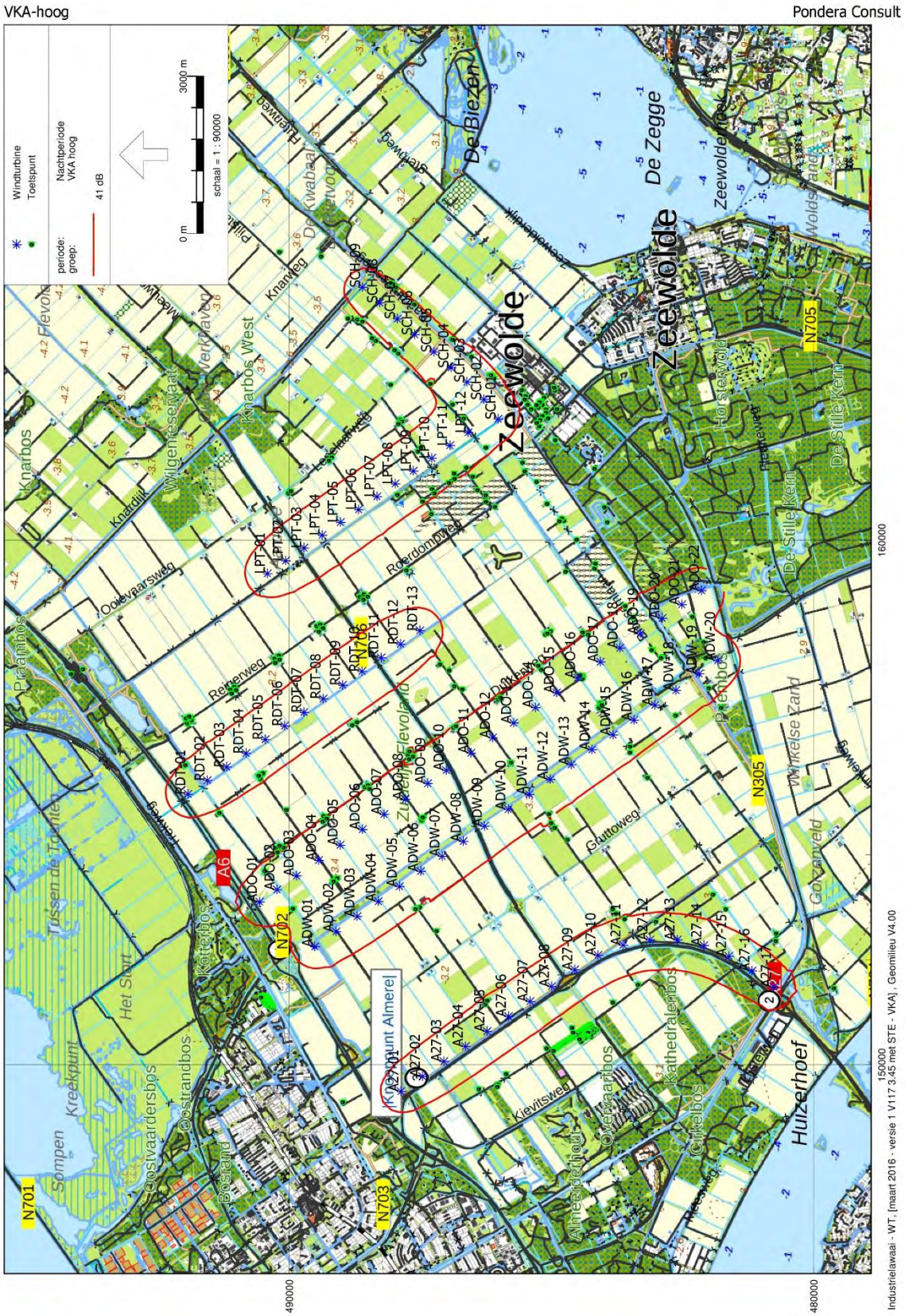
BIJLAGE 41 VKA TERUGVALOPTIE- GELUIDCONTOUR L_{NIGHT}



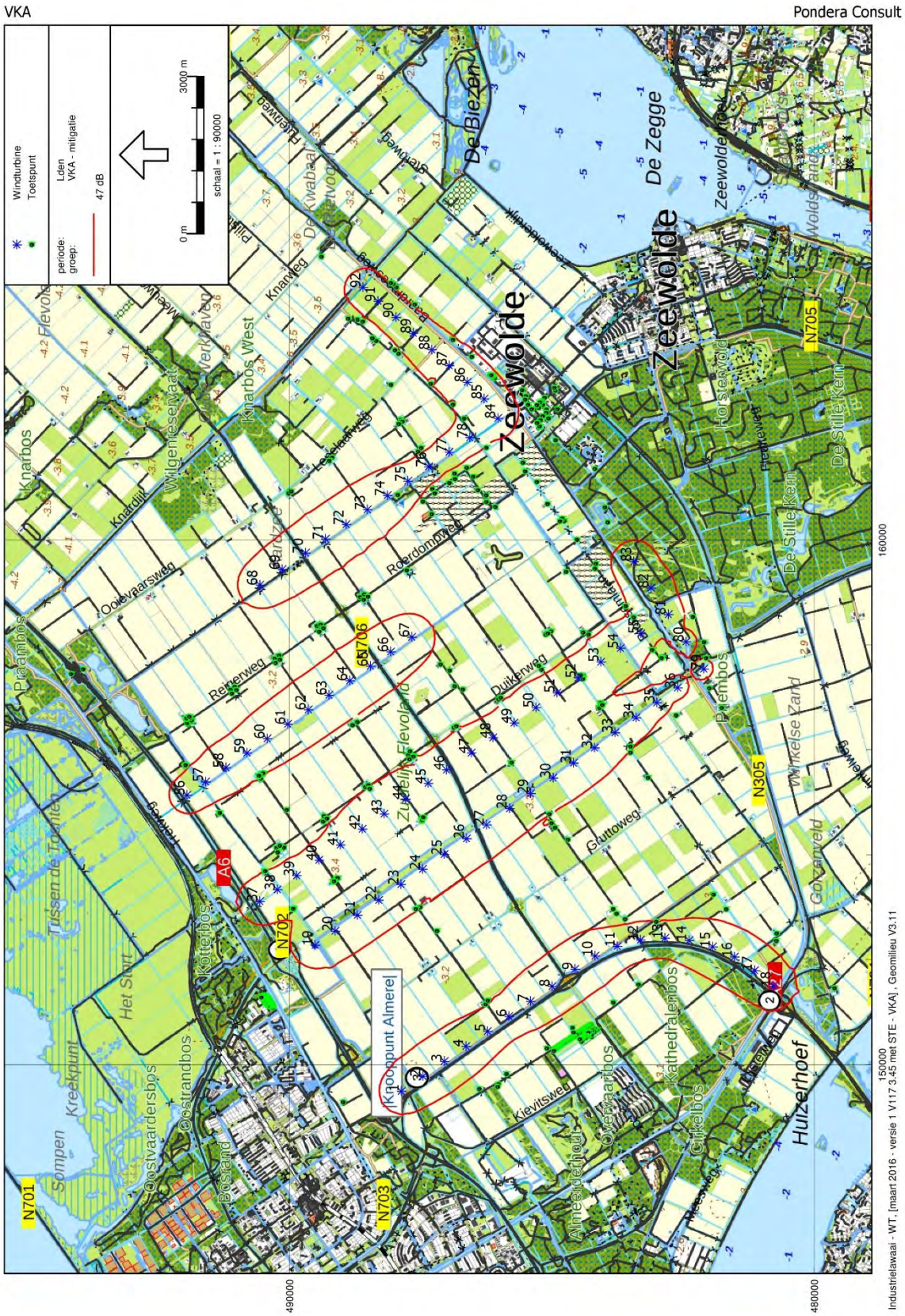
BIJLAGE 42 VKA-HOOG - GELUIDCONTOUR L_{DEN}



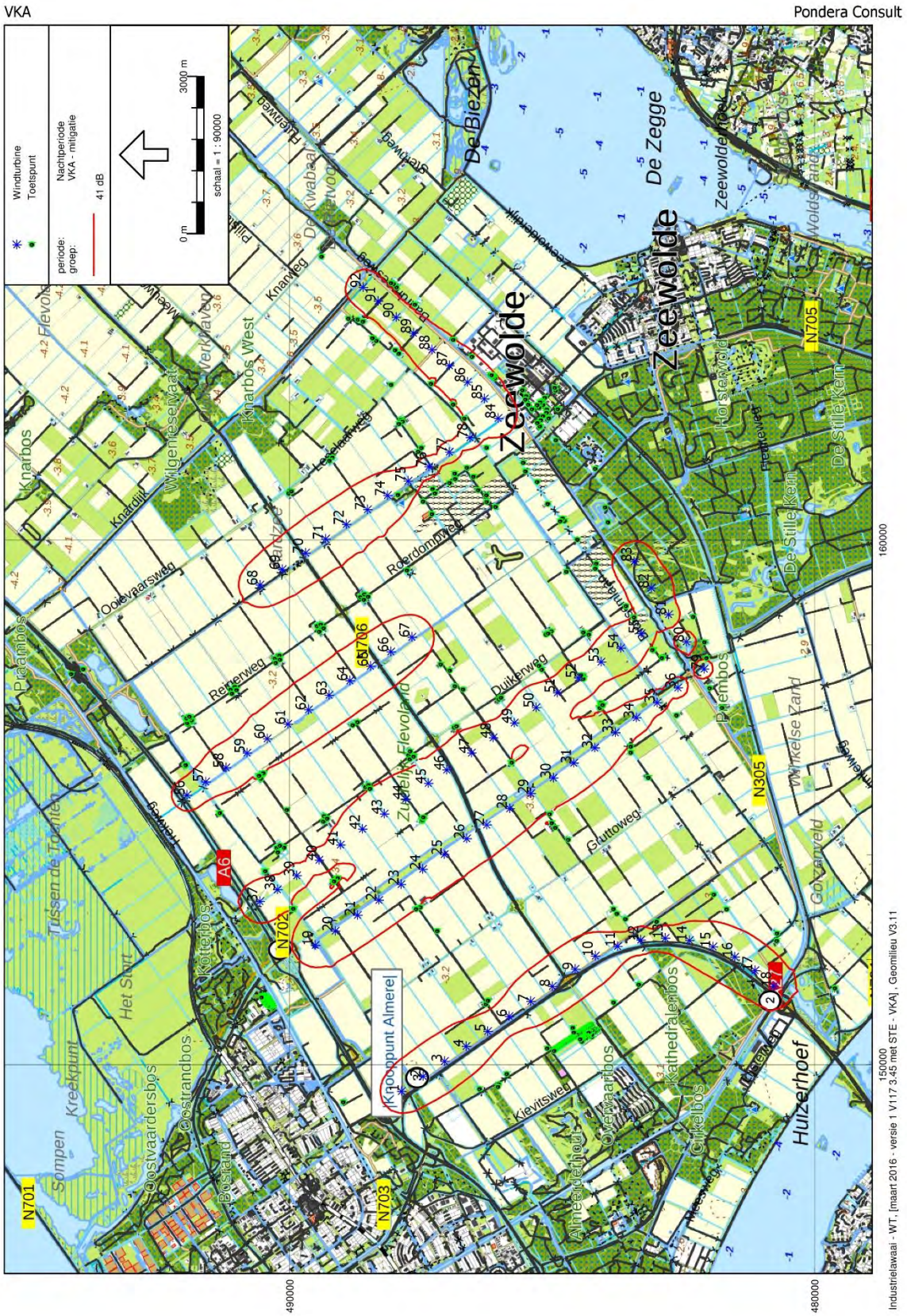
BIJLAGE 43 VKA-HOOG - GELUIDCONTOUR L_{NIGHT}



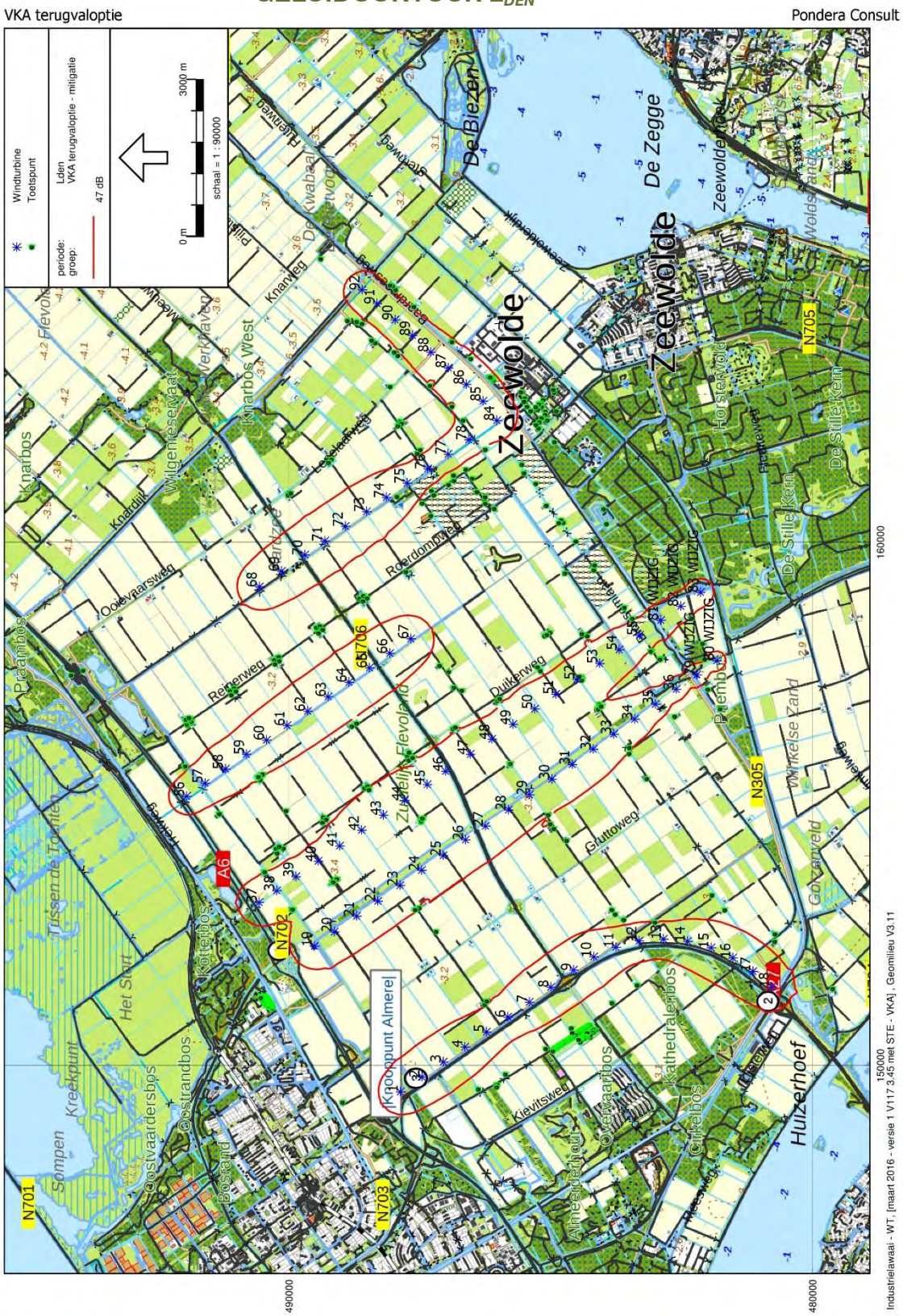
BIJLAGE 44 VKA GEMITIGEERD- GELUIDCONTOUR L_{DEN}



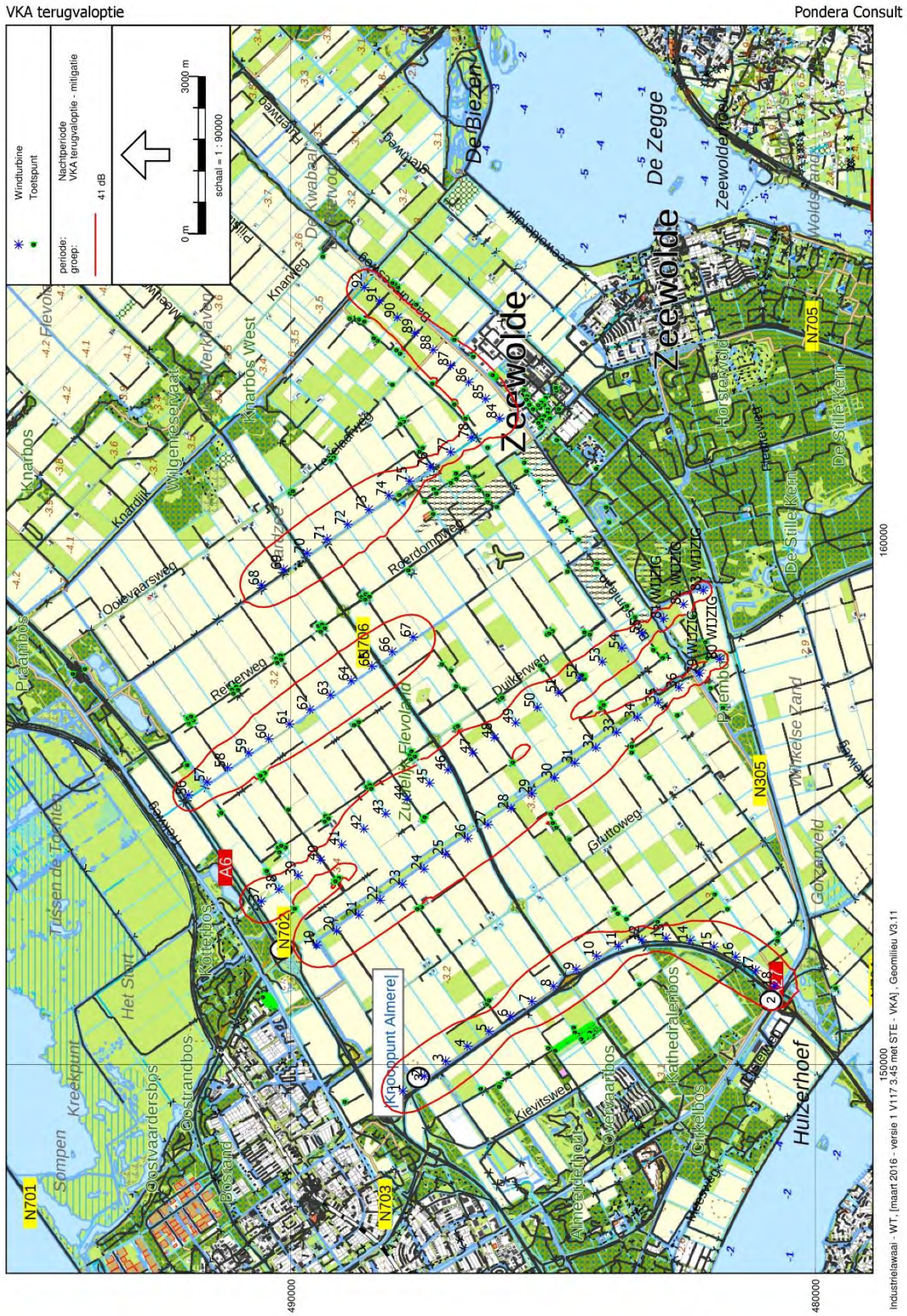
BIJLAGE 45 VKA GEMITIGEERD- GELUIDCONTOUR L_{NIGHT}



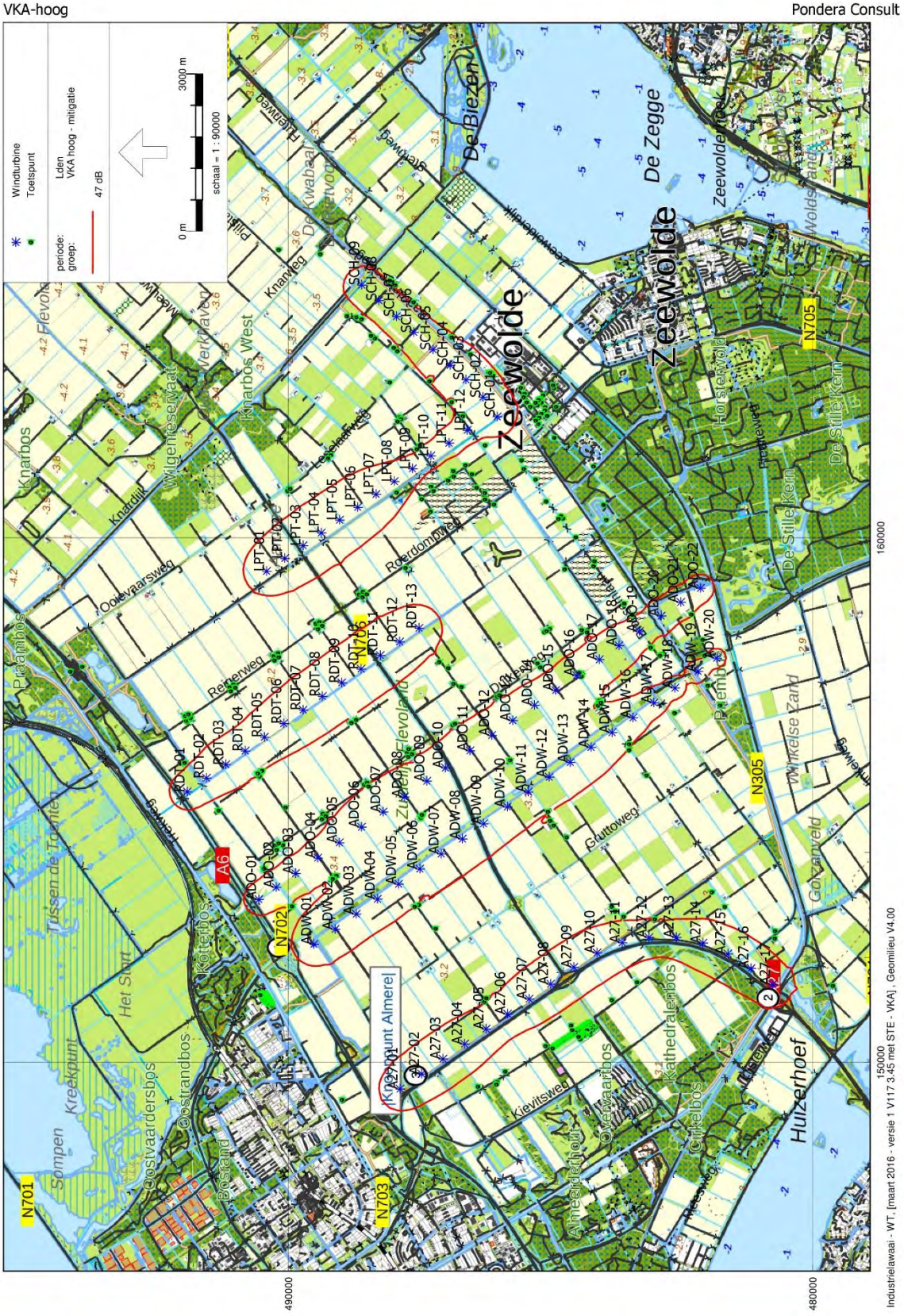
BIJLAGE 46 VKA TERUGVALOPTIE GEMITIGEERD-GELUIDCONTOUR L_{DEN}



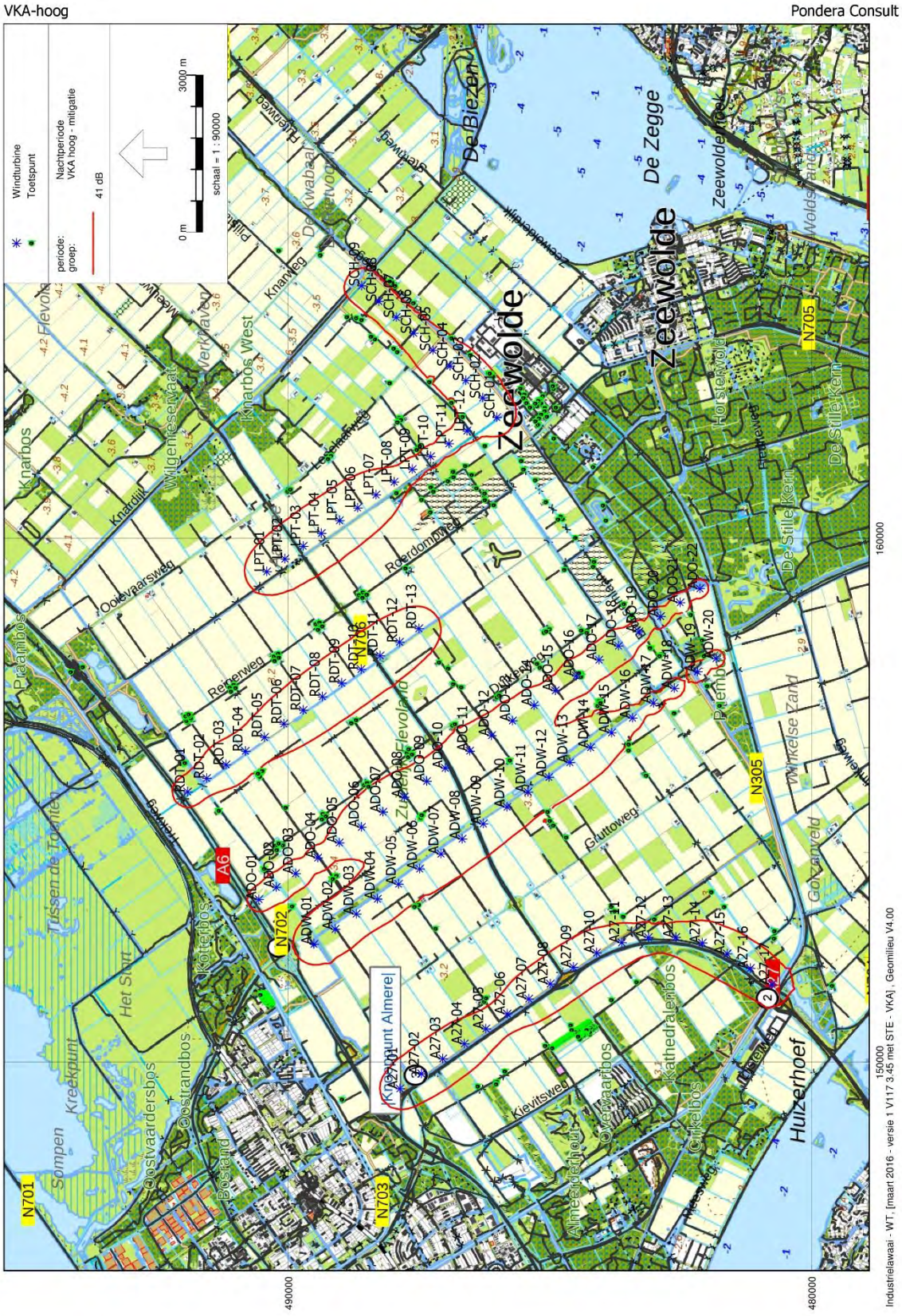
BIJLAGE 47 VKA TERUGVALOPTIE GEMITIGEERD-GELUIDCONTOUR L_{NIGHT}



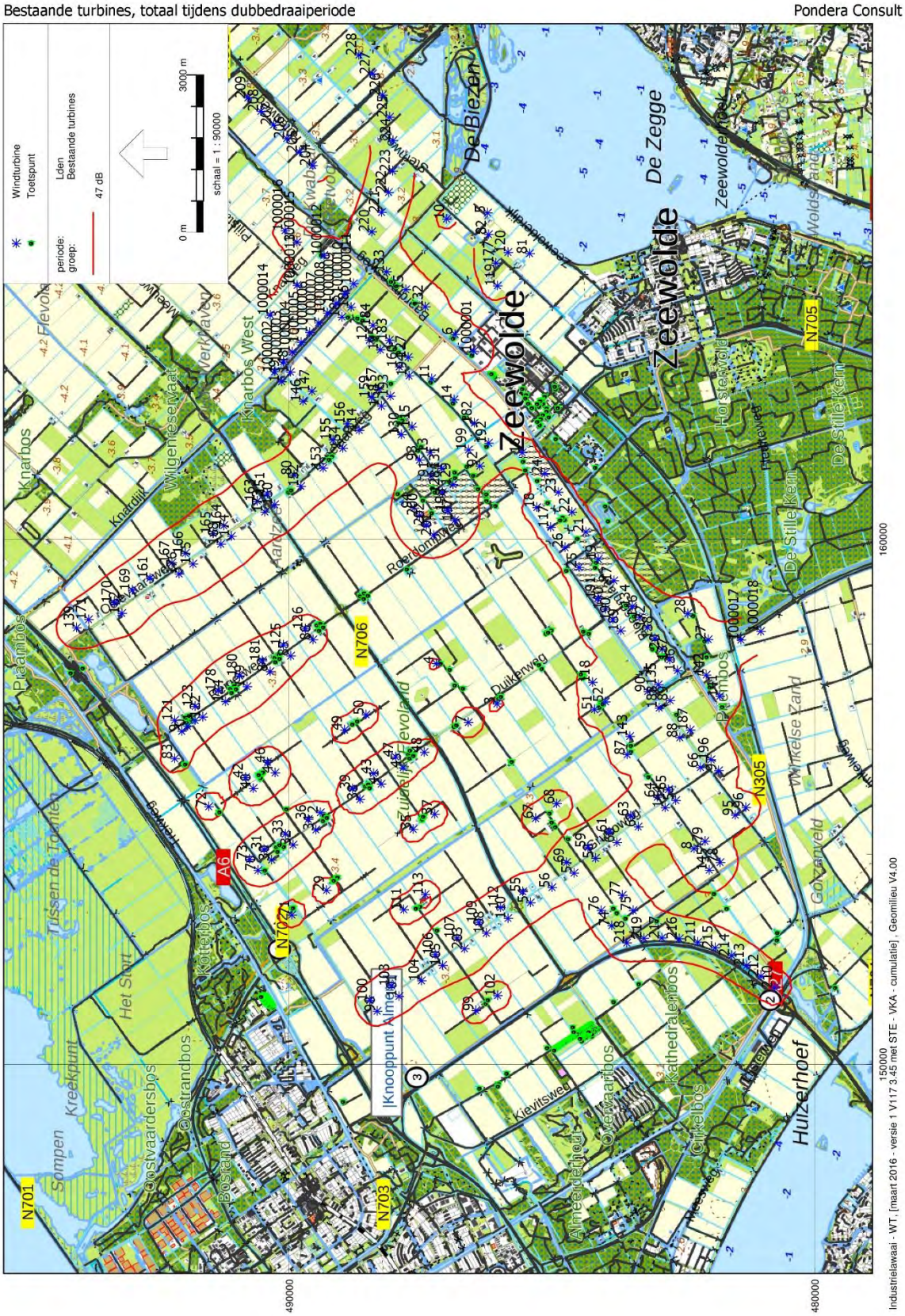
BIJLAGE 48 VKA-HOOG GEMITIGEERD- GELUIDCONTOUR L_{DEN}



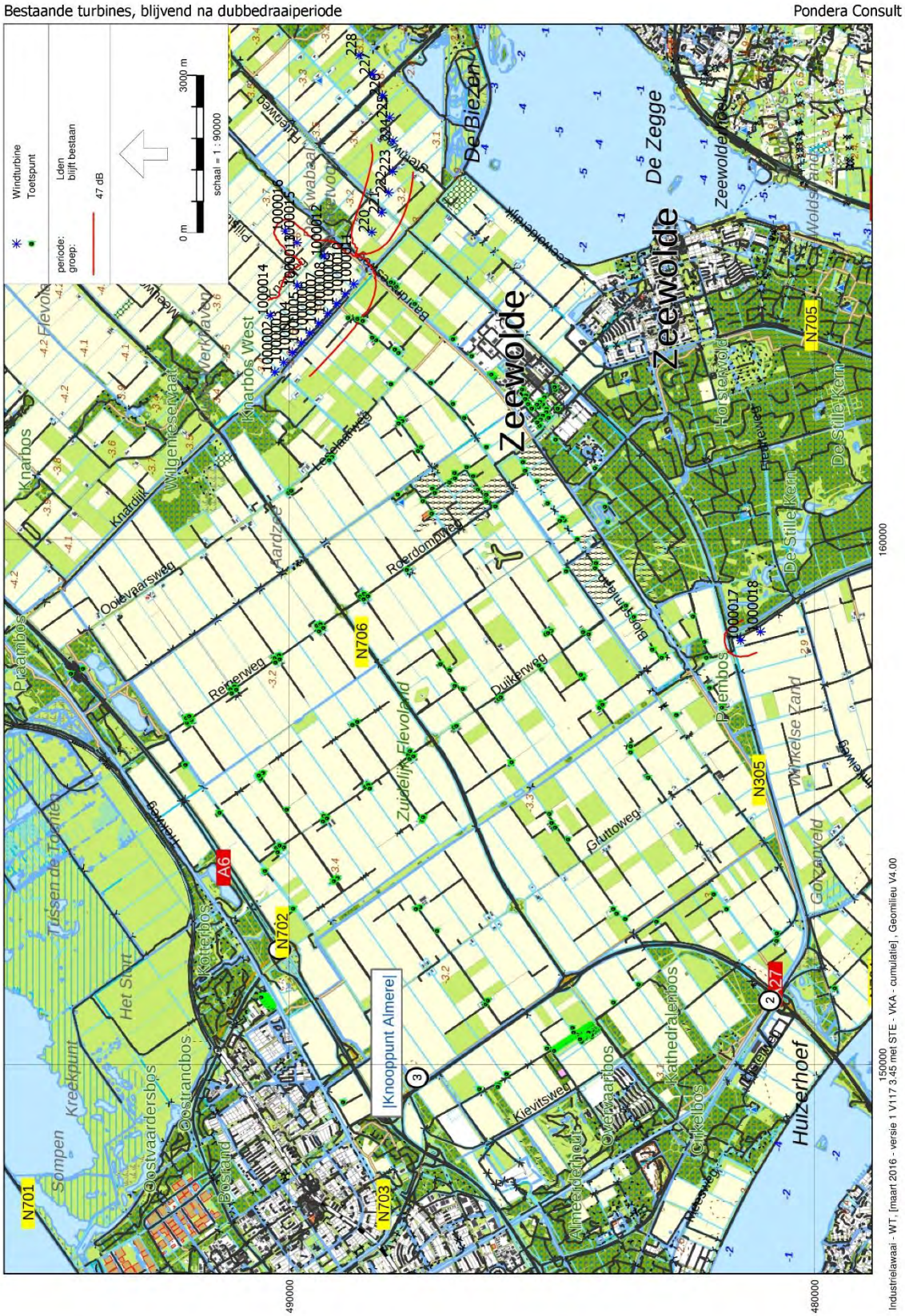
BIJLAGE 49 VKA-HOOG GEMITIGEERD- GELUIDCONTOUR L_{NIGHT}



BIJLAGE 50 BESTAAND DUBBELDRAAI- GELUIDCONTOUR L_{DEN}

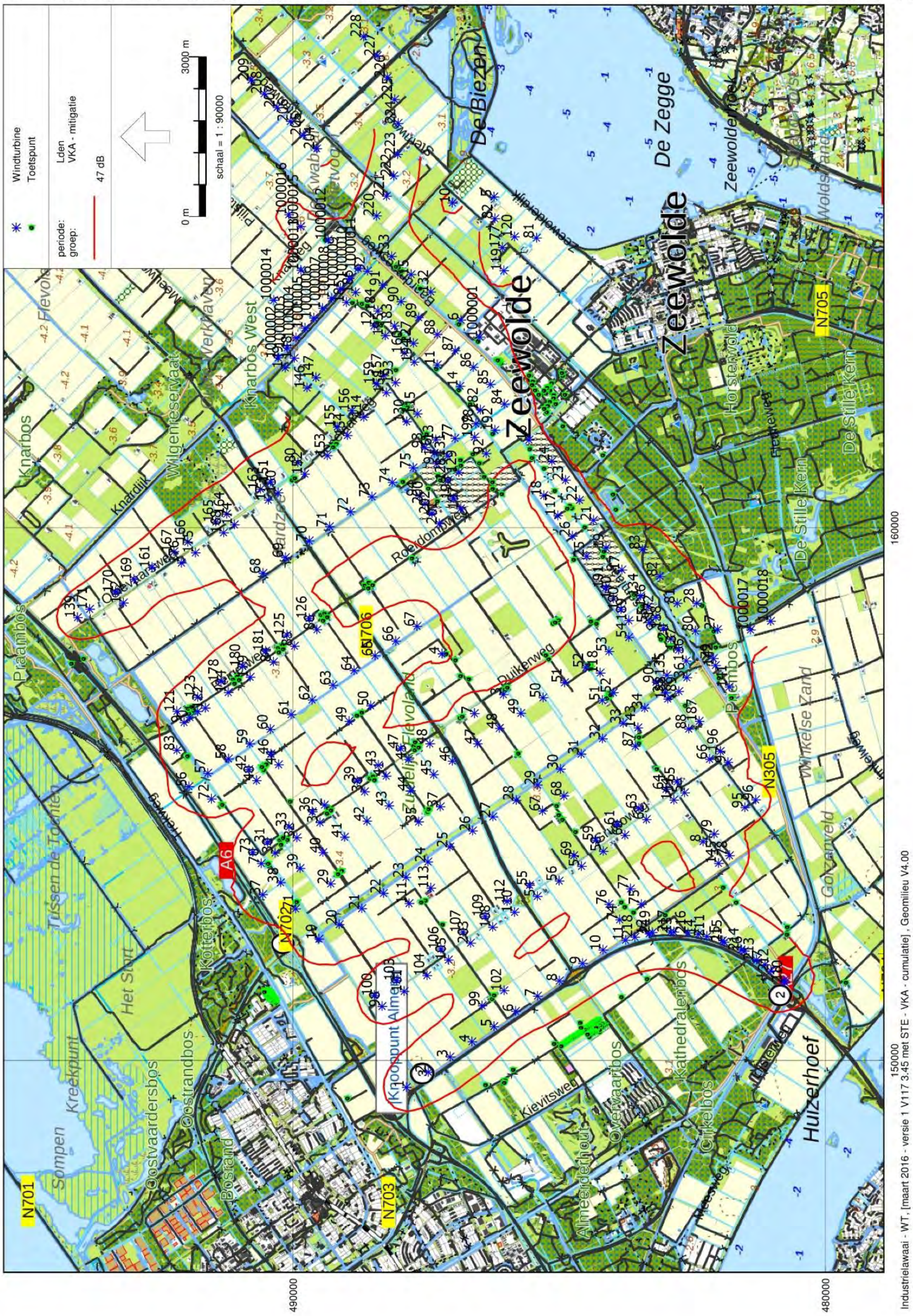


BIJLAGE 51 BESTAAND BLIJVEND- GELUIDCONTOUR L_{DEN}

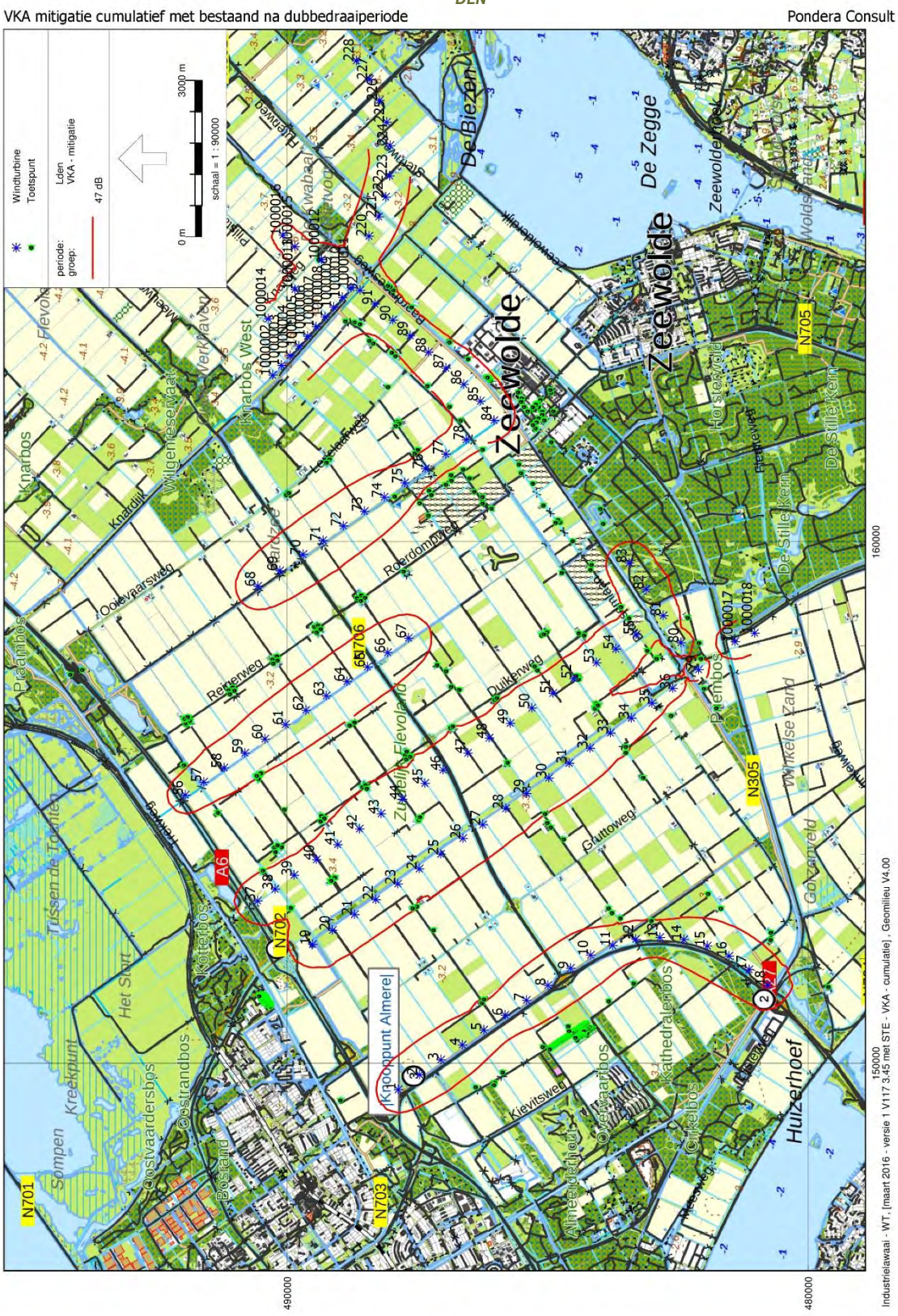


BIJLAGE 52 VKA- GEMITIGEERD-CUMU-DUBBELDRAAI GELUIDCONTOUR L_{DEN}

VKA mitigatie cumulatief met bestaand tijdens dubbedraaiperiode Pondera Consult

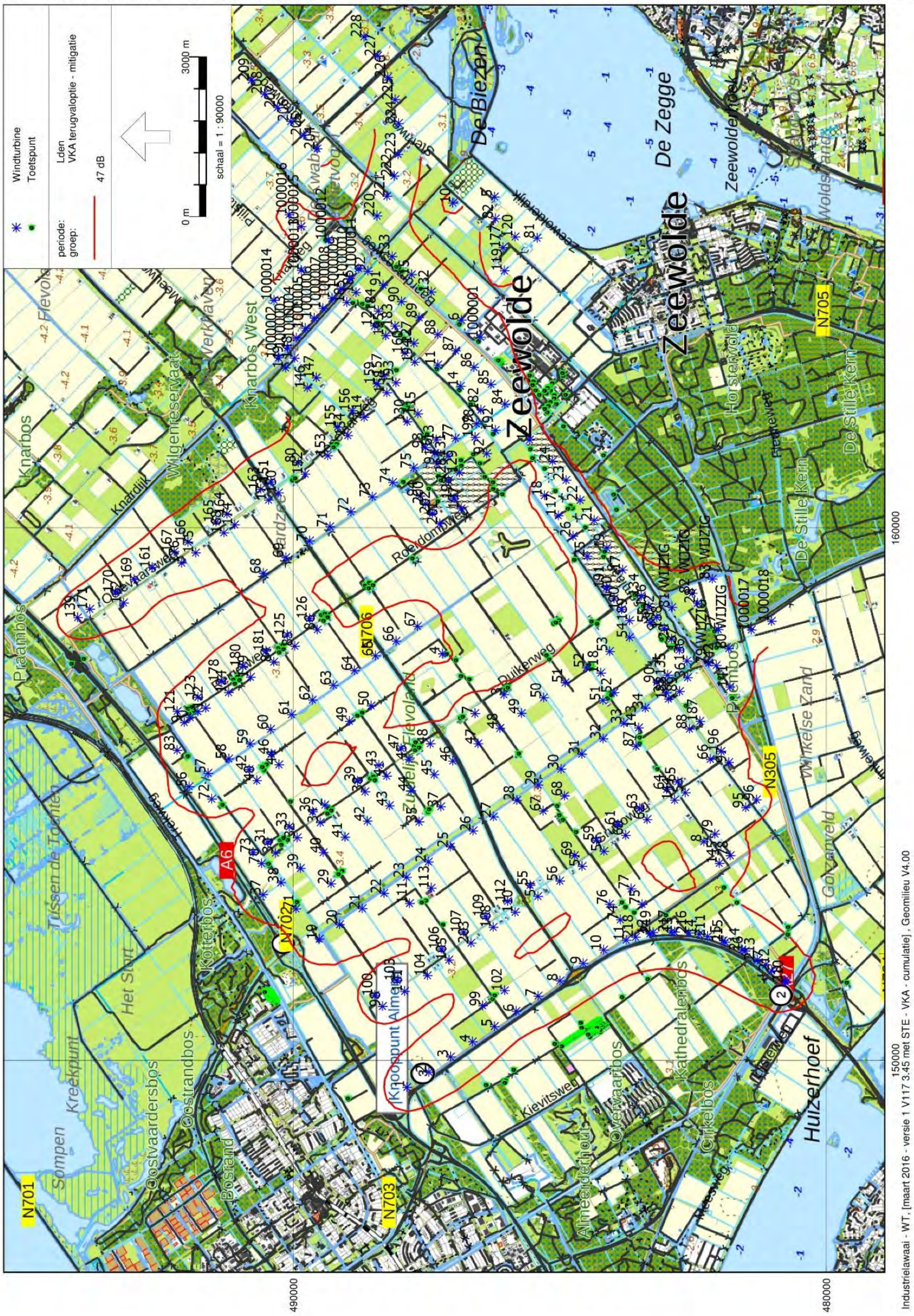


BIJLAGE 53 VKA- GEMITIGEERD-CUMU-NA DUBBELDRAAI GELUIDCONTOUR L_{DEN}

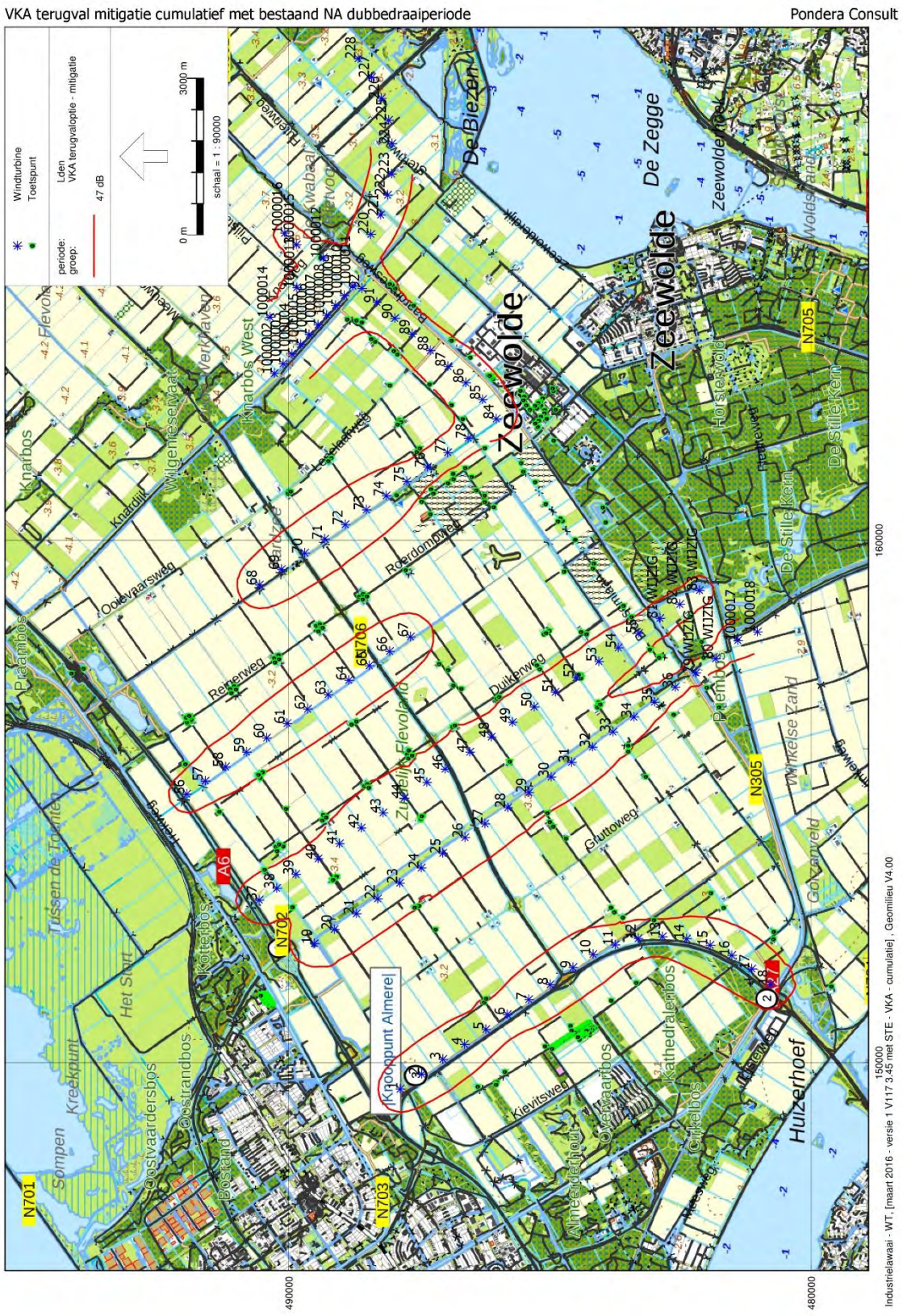


BIJLAGE 54 VKA TERUGVAL- GEMITIGEERD-CUMU-DUBBELDRAAI GELUIDCONTOUR L_{DEN}

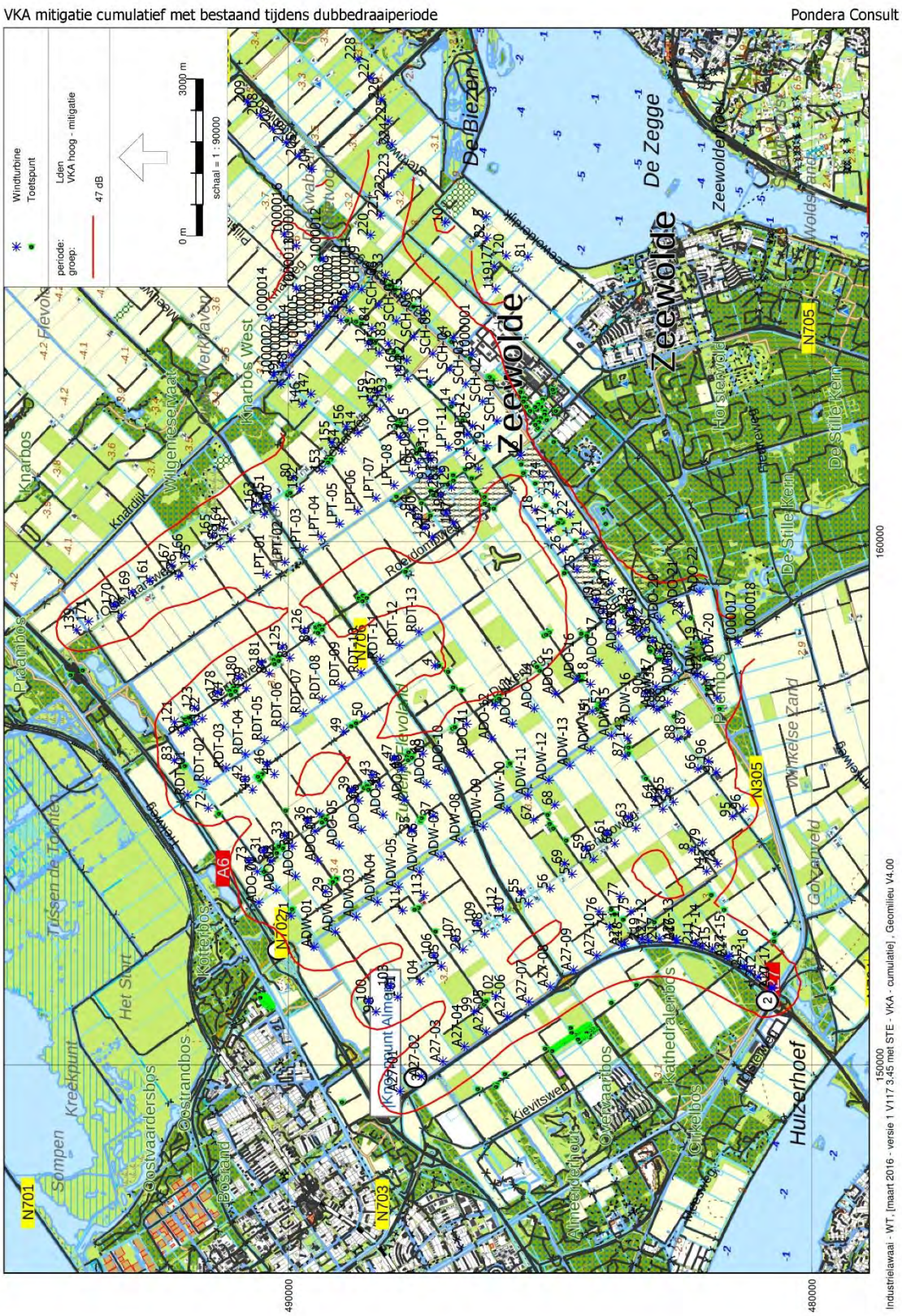
VKA mitigatie cumulatief met bestaand tijdens dubbedraaiperiode | Pondera Consult



BIJLAGE 55 VKA TERUGVAL- GEMITIGEERD-CUMU-NA DUBBELDRAAI GELUIDCONTOUR L_{DEN}

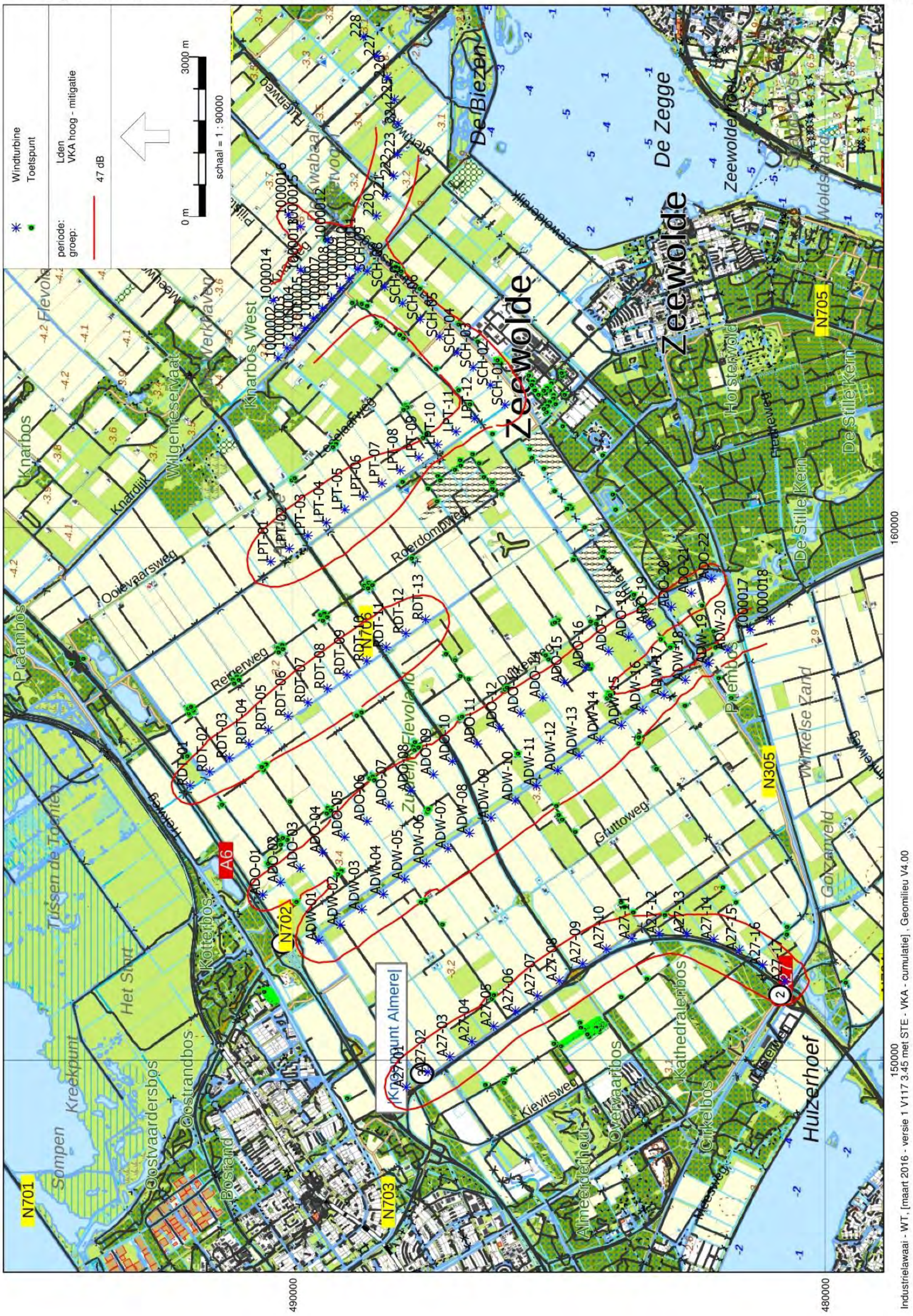


BIJLAGE 56 VKA-HOOG - GEMITIGEERD-CUMU-DUBBELDRAAI GELUIDCONTOUR L_{DEN}



BIJLAGE 57 VKA-HOOG - GEMITIGEERD-CUMU-NA DUBBELDRAAI GELUIDCONTOUR L_{DEN}

VKA mitigatie cumulatief met bestaand NA dubbedraaiperiode Pondera Consult



BIJLAGE 58 REKENMODEL EN RESULTATEN SLAGSCHADUW

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 18:24/3.0.654

SHADOW - Main Result

Calculation: SS alt 1a - 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

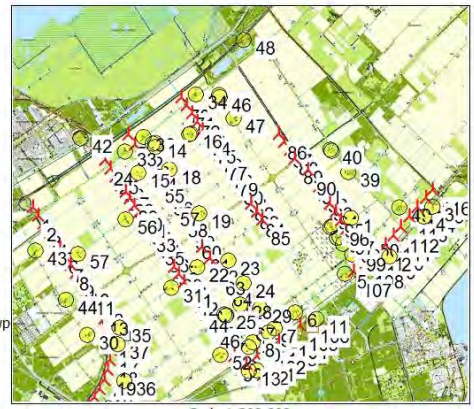
Operational time

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 Shadow receptor

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 [RPM]
1	149.433	487.948	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
2	149.639	487.653	-7,3	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
3	149.844	487.357	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
4	150.050	487.062	-6,1	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
5	150.255	486.766	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
6	150.461	486.471	-7,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
7	150.667	486.175	-6,2	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
8	150.872	485.880	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
9	151.078	485.584	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
10	151.283	485.289	-5,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
11	151.489	484.993	-5,2	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
12	151.817	484.559	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
13	152.020	484.261	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
14	152.182	483.940	-6,1	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
15	152.301	483.600	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
16	152.379	483.218	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
17	152.403	482.829	-4,2	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
18	152.374	482.460	-5,4	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
19	152.296	482.098	-7,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
20	152.171	481.750	-5,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
21	152.000	481.422	-5,1	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
22	151.788	481.119	-3,3	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
23	151.557	480.829	-5,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
24	152.202	489.640	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
25	152.407	489.344	-5,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
26	152.612	489.048	-4,4	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
27	152.817	488.752	-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	152.988	488.505	-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
29	153.159	488.259	-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
30	153.330	488.012	-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	153.501	487.766	-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
32	153.672	487.519	-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
33	153.842	487.273	-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
34	154.013	487.026	-5,1	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
35	154.184	486.779	-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
36	154.355	486.533	-5,1	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
37	154.526	486.286	-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
38	154.700	486.042	-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

To be continued on next page...

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 18:24/3.0.654

SHADOW - Main Result

Calculation: SS alt 1a - referentiewoningen

...continued from previous page

	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 [RPM]
39	154.871	485.795	-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
40	155.045	485.551	-5,6	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
41	155.256	485.259	-7,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
42	155.467	484.968	-6,3	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
43	155.678	484.676	-5,9	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
44	155.889	484.385	-4,5	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
45	156.101	484.093	-5,9	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
46	156.312	483.802	-5,6	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
47	156.523	483.510	-5,2	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
48	156.734	483.218	-5,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
49	156.974	482.889	-6,9	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
50	157.176	482.610	-5,6	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
51	153.108	490.557	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
52	153.353	490.208	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
53	153.601	489.855	-5,6	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
54	153.899	489.431	-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
55	154.185	489.023	-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
56	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
57	154.768	488.184	-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
58	155.059	487.779	-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
59	155.360	487.352	-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
60	155.614	487.001	-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
61	155.938	486.529	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
62	156.229	486.114	-5,7	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
63	156.512	485.712	-5,5	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
64	156.804	485.296	-6,3	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
65	157.087	484.894	-7,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
66	157.369	484.492	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
67	157.674	484.059	-6,4	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
68	157.937	483.684	-5,4	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
69	158.236	483.259	-5,6	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
70	155.135	491.904	-6,1	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
71	155.342	491.610	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
72	155.550	491.316	-5,2	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
73	155.758	491.022	-4,3	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
74	155.966	490.728	-5,6	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
75	156.173	490.434	-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
76	156.381	490.140	-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
77	156.588	489.846	-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	156.796	489.552	-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
79	157.003	489.258	-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
80	157.211	488.963	-5,7	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
81	157.419	488.669	-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
82	157.626	488.375	-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
83	157.834	488.081	-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
84	158.042	487.787	-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
85	158.249	487.493	-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
86	158.890	490.590	-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
87	159.097	490.296	-4,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
88	159.315	490.009	-5,2	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
89	159.516	489.711	-4,8	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
90	160.019	489.291	-5,2	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
91	160.231	488.995	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
92	160.443	488.692	-4,8	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
93	160.656	488.390	-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
94	160.869	488.087	-5,8	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
95	161.082	487.784	-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
96	161.298	487.484	-4,3	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
97	161.507	487.179	-4,8	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
98	161.720	486.876	-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
99	161.935	486.575	-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
100	157.639	482.328	-2,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
101	158.057	482.602	-6,4	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
102	158.473	482.879	-1,5	VESTAS V117-3.3 GridS..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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0031742489940
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Calculated:
29-9-2016 18:24/3.0.654

SHADOW - Main Result

Calculation: SS alt 1a - referentiewoningen

...continued from previous page

					WTG type							Shadow data	
	X (east)	Y (north)	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
103	158.890	483.156	-2,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
104	159.306	483.433	-5,6	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
105	159.722	483.710	-3,6	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
106	160.139	483.987	-2,6	LAGERWEY L100-2.5M...	Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1.200	15,2
107	161.774	485.640	-4,0	LAGERWEY L100-2.5M...	Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1.200	15,2
108	162.233	485.964	-5,1	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
109	162.697	486.292	-4,1	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
110	163.003	486.596	-4,5	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
111	163.316	486.941	-5,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
112	163.593	487.245	-4,9	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
113	163.936	487.625	-5,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
114	164.239	487.959	-5,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
115	164.554	488.306	-4,5	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
116	164.813	488.592	-4,8	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1

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]	[°]	[°]	
1	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
2	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
3	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
4	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
5	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
6	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
7	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
8	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
9	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
10	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
11	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
12	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
13	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
14	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
15	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
16	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
17	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
18	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
19	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
20	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
21	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
22	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
23	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
24	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
25	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
26	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
27	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
28	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
29	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
30	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
31	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
32	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
33	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
34	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
35	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
36	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
37	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
38	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
39	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
40	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
41	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
42	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
43	149.533	486.385	-2,3	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 18:24/3.0.654

SHADOW - Main Result

Calculation: SS alt 1a - 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]	[°]	[°]	
44	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
45	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
46	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
47	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
48	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
49	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
50	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
51	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
52	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
53	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
54	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
55	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
56	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
57	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
58	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
59	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
60	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 hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
1	249:11	302	1:11	49:30
2	109:12	143	1:03	24:21
3	61:19	111	0:50	14:28
4	69:39	139	0:51	16:21
5	165:56	118	1:49	41:58
6	101:18	127	1:25	14:57
7	270:19	316	1:53	48:06
8	204:11	235	1:29	35:07
9	312:19	310	2:04	62:31
10	250:16	322	1:44	48:51
11	188:04	175	1:51	41:14
12	18:09	53	0:28	4:01
13	0:00	0	0:00	0:00
14	70:20	153	0:44	15:26
15	129:58	298	1:04	26:54
16	127:34	223	1:00	30:10
17	92:37	182	0:49	20:32
18	75:05	184	0:50	16:42
19	60:46	152	0:49	12:41
20	81:26	178	0:47	18:39
21	102:03	205	0:53	24:29
22	115:08	262	1:01	22:37
23	120:53	248	0:52	26:02
24	125:18	250	0:52	26:39
25	200:28	329	1:13	41:08
26	205:20	329	1:12	42:24
27	180:31	311	1:12	36:51
28	129:36	159	1:18	19:50
29	133:53	264	0:49	26:48
30	79:29	212	0:37	16:27
31	101:29	191	0:54	23:22
32	170:15	237	1:06	35:27
33	95:56	218	0:44	18:44
34	128:46	200	0:55	25:02
35	163:56	265	0:59	35:03
36	55:58	152	0:38	12:39
37	159:29	189	1:18	31:57
38	12:23	41	0:28	2:50
39	15:56	80	0:23	3:07

To be continued on next page...

Project:
715027 SS

Licensed user:
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Calculated:
29-9-2016 18:24/3.0.654

SHADOW - Main Result

Calculation: SS alt 1a - referentiewoningen

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No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
40	23:45	80	0:26	3:43
41	30:18	89	0:26	4:53
42	10:58	40	0:25	1:29
43	58:49	139	0:38	14:33
44	53:40	131	0:36	13:13
45	32:30	129	0:25	5:42
46	26:47	108	0:25	4:52
47	18:01	97	0:19	3:12
48	0:00	0	0:00	0:00
49	126:09	231	0:56	25:08
50	241:16	289	1:45	50:52
51	59:58	139	0:49	12:07
52	62:34	109	0:53	14:16
53	82:17	152	0:59	18:31
54	84:49	179	0:49	18:36
55	27:35	57	0:38	6:33
56	95:31	198	0:53	23:09
57	223:55	322	1:00	46:23
58	74:08	173	0:45	17:03
59	51:48	107	0:50	11:47
60	52:15	139	0:49	11:04

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 !O! hub: 141,5 m (TOT: 200,0 m) (117)	0:00	0:00
2	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (118)	0:00	0:00
3	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (119)	0:00	0:00
4	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (120)	0:00	0:00
5	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (121)	59:08	14:25
6	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (122)	64:32	14:48
7	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (123)	60:42	13:47
8	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (124)	72:19	13:24
9	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (125)	26:03	3:42
10	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (126)	0:00	0:00
11	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (127)	39:17	10:16
12	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (128)	9:35	2:05
13	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (129)	4:48	0:53
14	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (130)	22:46	5:01
15	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (131)	101:11	25:13
16	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (132)	67:27	13:14
17	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (133)	133:11	27:58
18	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (134)	78:10	11:33
19	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (135)	11:33	2:28
20	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (136)	25:08	6:01
21	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (137)	13:23	2:50
22	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (138)	6:39	1:22
23	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (139)	27:35	6:33
24	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (140)	38:34	7:31
25	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (141)	43:52	8:00
26	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (142)	22:43	4:26
27	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (143)	16:15	3:14
28	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (144)	32:14	4:47
29	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (145)	0:00	0:00
30	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (146)	0:00	0:00
31	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (147)	57:34	15:05
32	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (148)	23:11	5:26
33	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (149)	10:14	1:54
34	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (150)	4:32	0:48
35	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (151)	0:00	0:00
36	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (152)	0:00	0:00
37	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (153)	2:18	0:31

To be continued on next page...

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Calculated:
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SHADOW - Main Result

Calculation: SS alt 1a - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
38	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (154)	5:34	1:16
39	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (155)	10:24	2:21
40	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (156)	16:57	3:33
41	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (157)	92:20	20:27
42	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (158)	36:25	7:09
43	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (159)	39:58	8:22
44	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (160)	39:16	8:29
45	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (161)	50:07	11:51
46	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (162)	74:44	15:51
47	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (163)	135:50	21:37
48	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (164)	25:26	5:55
49	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (165)	37:44	8:18
50	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (166)	115:43	25:36
51	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (167)	96:32	22:25
52	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (168)	127:15	28:54
53	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (169)	187:45	37:18
54	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (170)	44:33	10:46
55	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (171)	54:30	11:21
56	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (172)	3:36	0:42
57	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (173)	6:03	1:23
58	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (174)	16:30	3:54
59	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (175)	38:13	7:15
60	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (176)	0:00	0:00
61	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (177)	27:29	6:09
62	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (178)	30:09	7:12
63	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (179)	95:54	21:03
64	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (180)	56:31	11:17
65	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (181)	67:04	14:39
66	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (182)	47:54	9:03
67	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (183)	169:16	32:53
68	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (184)	179:37	33:12
69	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (185)	117:17	25:45
70	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (186)	40:08	9:15
71	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (187)	65:58	12:57
72	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (188)	45:49	7:25
73	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (189)	30:15	4:49
74	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (190)	108:26	27:30
75	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (191)	30:50	5:59
76	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (192)	18:40	3:03
77	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (193)	3:30	0:33
78	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (194)	0:00	0:00
79	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (195)	0:00	0:00
80	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (196)	0:00	0:00
81	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (197)	0:00	0:00
82	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (198)	0:00	0:00
83	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (199)	0:00	0:00
84	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (200)	0:00	0:00
85	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (201)	0:00	0:00
86	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (202)	0:00	0:00
87	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (203)	0:00	0:00
88	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (204)	0:00	0:00
89	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (205)	0:00	0:00
90	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (206)	19:20	3:23
91	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (207)	29:21	4:37
92	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (208)	7:12	1:30
93	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (209)	3:58	0:35
94	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (210)	6:48	1:28
95	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (211)	56:31	12:39
96	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (212)	113:29	26:59
97	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (213)	165:21	28:53
98	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (214)	133:30	31:01
99	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (215)	141:36	29:46
100	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (216)	89:43	13:18
101	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (217)	196:34	30:21
102	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (218)	153:19	26:10

To be continued on next page...

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SHADOW - Main Result

Calculation: SS alt 1a - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
103	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (219)	200:08	34:29
104	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (220)	50:18	10:33
105	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (221)	100:23	16:38
106	LAGERWEY L100-2.5MW 2520 100.0 !O! hub: 90,0 m (TOT: 140,0 m) (222)	183:49	39:34
107	LAGERWEY L100-2.5MW 2520 100.0 !O! hub: 90,0 m (TOT: 140,0 m) (223)	149:06	37:29
108	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (224)	81:49	16:37
109	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (225)	172:00	35:08
110	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (226)	35:50	8:16
111	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (227)	21:59	5:05
112	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (228)	47:35	8:27
113	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (229)	118:15	24:57
114	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (230)	76:15	18:33
115	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (231)	17:55	4:41
116	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (232)	0:00	0:00

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Calculated:
29-9-2016 18:56/3.0.654

SHADOW - Main Result

Calculation: SS alt 1b - 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

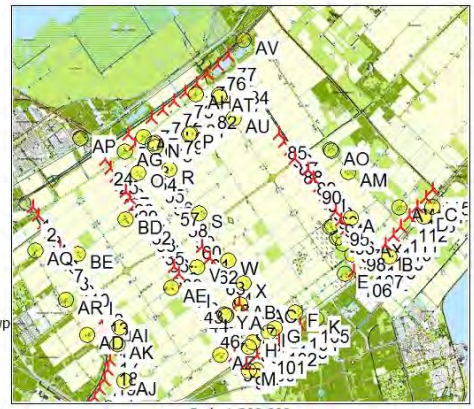
Operational time

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 Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data Calculation distance [m]	RPM [RPM]
1	149.433	487.948	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
2	149.639	487.653	-7,3	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
3	149.844	487.357	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
4	150.050	487.062	-6,1	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
5	150.255	486.766	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
6	150.461	486.471	-7,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
7	150.667	486.175	-6,2	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
8	150.872	485.880	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
9	151.078	485.584	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
10	151.283	485.289	-5,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
11	151.489	484.993	-5,2	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
12	151.817	484.559	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
13	152.020	484.261	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
14	152.182	483.940	-6,1	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
15	152.301	483.600	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
16	152.379	483.218	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
17	152.403	482.829	-4,2	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
18	152.374	482.460	-5,4	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
19	152.296	482.098	-7,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
20	152.171	481.750	-5,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
21	152.000	481.422	-5,1	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
22	151.788	481.119	-3,3	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
23	151.557	480.829	-5,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
24	152.202	489.640	-6,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
25	152.407	489.344	-5,0	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
26	152.612	489.048	-4,4	VESTAS V117-3.3 GridS..Yes		VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
27	152.817	488.752	-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	152.988	488.505	-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
29	153.159	488.259	-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
30	153.330	488.012	-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	153.501	487.766	-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
32	153.672	487.519	-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
33	153.842	487.273	-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
34	154.013	487.026	-5,1	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
35	154.184	486.779	-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
36	154.355	486.533	-5,1	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
37	154.526	486.286	-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
38	154.700	486.042	-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

To be continued on next page...

Project:
715027 SS

Licensed user:
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0031742489940
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Calculated:
29-9-2016 18:56/3.0.654

SHADOW - Main Result

Calculation: SS alt 1b - referentiewoningen

...continued from previous page

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
39	154.871	485.795	-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
40	155.045	485.551	-5,6	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
41	155.256	485.259	-7,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
42	155.467	484.968	-6,3	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
43	155.678	484.676	-5,9	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
44	155.889	484.385	-4,5	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
45	156.101	484.093	-5,9	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
46	156.312	483.802	-5,6	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
47	156.523	483.510	-5,2	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
48	156.734	483.218	-5,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
49	156.974	482.889	-6,9	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
50	157.176	482.610	-5,6	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
51	153.108	490.557	-6,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
52	153.353	490.208	-6,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
53	153.601	489.855	-5,6	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
54	153.899	489.431	-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
55	154.185	489.023	-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
56	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
57	154.768	488.184	-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
58	155.059	487.779	-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
59	155.360	487.352	-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
60	155.614	487.001	-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
61	155.938	486.529	-6,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
62	156.229	486.114	-5,7	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
63	156.512	485.712	-5,5	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
64	156.804	485.296	-6,3	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
65	157.087	484.894	-7,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
66	157.369	484.492	-6,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
67	157.674	484.059	-6,4	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
68	157.937	483.684	-5,4	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
69	158.236	483.259	-5,6	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
70	154.003	491.145	-6,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
71	154.440	491.445	-6,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
72	154.871	491.753	-6,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
73	155.295	492.071	-4,8	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
74	155.725	492.381	-5,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
75	156.130	492.725	-2,8	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
76	156.539	493.059	-6,2	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
77	156.945	493.400	-6,8	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
78	154.476	490.477	-5,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
79	154.903	490.773	-5,1	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
80	155.328	491.073	-6,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
81	155.753	491.373	-6,7	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
82	156.178	491.673	-6,1	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
83	157.002	492.255	-4,9	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
84	157.427	492.555	-5,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
85	158.890	490.590	-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
86	159.097	490.296	-4,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
87	159.315	490.009	-5,2	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
88	159.516	489.711	-4,8	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
89	160.019	489.291	-5,2	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
90	160.231	488.995	-6,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
91	160.443	488.692	-4,8	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
92	160.656	488.390	-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
93	160.869	488.087	-5,8	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
94	161.082	487.784	-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
95	161.298	487.484	-4,3	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
96	161.507	487.179	-4,8	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
97	161.720	486.876	-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
98	161.935	486.575	-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
99	157.639	482.328	-2,0	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
100	158.057	482.602	-6,4	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
101	158.473	482.879	-1,5	VESTAS V117-3.3 GridS...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
102	158.890	483.156	-2,0	VESTAS V117-3.3 GridS...	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

Licensed user:
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Calculated:
29-9-2016 18:56/3.0.654

SHADOW - Main Result

Calculation: SS alt 1b - referentiewoningen

...continued from previous page

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
103	159.306	483.433	-5,6	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
104	159.722	483.710	-3,6	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
105	160.139	483.987	-2,6	LAGERWEY L100-2.5M...	Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1.200	15,2
106	161.774	485.640	-4,0	LAGERWEY L100-2.5M...	Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1.200	15,2
107	162.233	485.964	-5,1	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
108	162.697	486.292	-4,1	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
109	163.003	486.596	-4,5	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
110	163.316	486.941	-5,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
111	163.593	487.245	-4,9	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
112	163.936	487.625	-5,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
113	164.239	487.959	-5,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
114	164.554	488.306	-4,5	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
115	164.813	488.592	-4,8	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1

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"

To be continued on next page...

Project:
715027 SS

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Calculated:
29-9-2016 18:56/3.0.654

SHADOW - Main Result

Calculation: SS alt 1b - referentiewoningen

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No.	X (east)	Y (north)	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction 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 hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
A	249:11	302	1:11	49:30
B	109:12	143	1:03	24:21
C	61:19	111	0:50	14:28
D	69:39	139	0:51	16:21
E	165:56	118	1:49	41:58
F	153:27	160	1:49	22:53
G	282:24	329	1:53	51:04
H	204:11	235	1:29	35:07
I	325:30	329	2:04	65:52
J	250:16	322	1:44	48:51
K	199:33	191	1:51	43:50
L	18:09	53	0:28	4:01
M	0:00	0	0:00	0:00
N	71:28	164	0:44	15:44
O	129:58	298	1:04	26:54
P	83:02	141	0:48	18:12
Q	101:38	220	0:49	22:52
R	75:05	184	0:50	16:42
S	60:46	152	0:49	12:41
T	81:26	178	0:47	18:39
U	72:44	118	0:52	16:08
V	115:08	262	1:01	22:37
W	120:53	248	0:52	26:02
X	125:18	250	0:52	26:39
Y	200:28	329	1:13	41:08
Z	205:20	329	1:12	42:24
AA	180:31	311	1:12	36:51
AB	129:36	159	1:18	19:50
AC	133:53	264	0:49	26:48
AD	79:29	212	0:37	16:27
AE	101:29	191	0:54	23:22
AF	201:11	270	1:11	43:00
AG	95:56	218	0:44	18:44
AH	230:28	284	1:10	46:59
AI	163:56	265	0:59	35:03
AJ	55:58	152	0:38	12:39
AK	159:29	189	1:18	31:57
AL	12:23	41	0:28	2:50
AM	11:08	70	0:18	2:07
AN	23:45	80	0:26	3:43

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29-9-2016 18:56/3.0.654

SHADOW - Main Result

Calculation: SS alt 1b - referentiewoningen

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No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
AO	30:18	89	0:26	4:53
AP	10:58	40	0:25	1:29
AQ	58:49	139	0:38	14:33
AR	53:40	131	0:36	13:13
AS	105:54	198	0:56	23:16
AT	96:45	195	0:56	21:35
AU	21:35	62	0:28	4:47
AV	30:26	62	0:39	5:13
AW	126:09	231	0:56	25:08
AX	241:16	289	1:45	50:52
AY	59:58	139	0:49	12:07
AZ	62:34	109	0:53	14:16
BA	82:17	152	0:59	18:31
BB	84:49	179	0:49	18:36
BC	27:35	57	0:38	6:33
BD	95:31	198	0:53	23:09
BE	223:55	322	1:00	46:23
BF	74:08	173	0:45	17:03
BG	51:48	107	0:50	11:47
BH	52:15	139	0:49	11:04

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 !O! hub: 141,5 m (TOT: 200,0 m) (233)	0:00	0:00
2	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (234)	0:00	0:00
3	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (235)	0:00	0:00
4	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (236)	0:00	0:00
5	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (237)	59:08	14:25
6	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (238)	64:32	14:48
7	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (239)	60:42	13:47
8	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (240)	72:19	13:24
9	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (241)	26:03	3:42
10	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (242)	0:00	0:00
11	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (243)	39:17	10:16
12	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (244)	9:35	2:05
13	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (245)	4:48	0:53
14	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (246)	22:46	5:01
15	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (247)	101:11	25:13
16	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (248)	67:27	13:14
17	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (249)	133:11	27:58
18	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (250)	78:10	11:33
19	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (251)	11:33	2:28
20	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (252)	25:08	6:01
21	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (253)	13:23	2:50
22	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (254)	6:39	1:22
23	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (255)	27:35	6:33
24	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (256)	38:34	7:31
25	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (257)	43:52	8:00
26	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (258)	22:43	4:26
27	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (259)	16:15	3:14
28	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (260)	32:14	4:47
29	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (261)	0:00	0:00
30	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (262)	0:00	0:00
31	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (263)	57:34	15:05
32	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (264)	23:11	5:26
33	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (265)	10:14	1:54
34	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (266)	4:32	0:48
35	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (267)	0:00	0:00
36	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (268)	0:00	0:00
37	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (269)	2:18	0:31
38	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (270)	5:34	1:16

To be continued on next page...

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29-9-2016 18:56/3.0.654

SHADOW - Main Result

Calculation: SS alt 1b - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
39	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (271)	10:24	2:21
40	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (272)	16:57	3:33
41	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (273)	92:20	20:27
42	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (274)	36:25	7:09
43	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (275)	39:58	8:22
44	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (276)	39:16	8:29
45	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (277)	50:07	11:51
46	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (278)	74:44	15:51
47	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (279)	135:50	21:37
48	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (280)	25:26	5:55
49	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (281)	37:44	8:18
50	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (282)	115:43	25:36
51	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (283)	96:32	22:31
52	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (284)	127:15	28:54
53	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (285)	187:45	37:18
54	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (286)	44:33	10:46
55	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (287)	54:30	11:21
56	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (288)	3:36	0:42
57	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (289)	6:03	1:23
58	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (290)	16:30	3:54
59	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (291)	38:13	7:15
60	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (292)	0:00	0:00
61	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (293)	27:29	6:09
62	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (294)	30:09	7:12
63	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (295)	95:54	21:03
64	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (296)	56:31	11:17
65	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (297)	67:04	14:39
66	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (298)	47:54	9:03
67	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (299)	169:16	32:53
68	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (300)	179:37	33:14
69	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (301)	117:17	25:52
70	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (302)	0:00	0:00
71	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (303)	4:53	0:54
72	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (304)	17:40	3:40
73	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (305)	125:09	28:38
74	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (306)	44:02	9:50
75	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (307)	0:00	0:00
76	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (308)	8:11	1:16
77	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (309)	28:40	4:57
78	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (310)	39:30	9:04
79	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (311)	108:25	24:26
80	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (312)	1:31	0:12
81	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (313)	66:12	10:38
82	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (314)	150:38	31:50
83	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (315)	6:38	1:38
84	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (316)	0:00	0:00
85	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (317)	0:00	0:00
86	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (318)	0:00	0:00
87	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (319)	0:00	0:00
88	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (320)	0:00	0:00
89	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (321)	19:20	3:23
90	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (322)	29:21	4:37
91	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (323)	2:24	0:29
92	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (324)	3:58	0:35
93	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (325)	6:48	1:28
94	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (326)	56:31	12:39
95	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (327)	113:29	26:59
96	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (328)	165:21	28:53
97	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (329)	133:30	31:01
98	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (330)	141:36	29:46
99	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (331)	89:43	13:18
100	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (332)	196:34	30:21
101	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (333)	153:19	26:10
102	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (334)	200:08	34:31
103	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (335)	90:40	17:35

To be continued on next page...

Project:
715027 SS

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Calculated:
29-9-2016 18:56/3.0.654

SHADOW - Main Result

Calculation: SS alt 1b - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
104	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (336)	148:05	25:49
105	LAGERWEY L100-2.5MW 2520 100.0 !O! hub: 90,0 m (TOT: 140,0 m) (337)	183:49	39:34
106	LAGERWEY L100-2.5MW 2520 100.0 !O! hub: 90,0 m (TOT: 140,0 m) (338)	149:06	37:29
107	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (339)	81:49	16:37
108	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (340)	172:00	35:08
109	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (341)	35:50	8:16
110	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (342)	21:59	5:05
111	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (343)	47:35	8:27
112	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (344)	118:15	24:57
113	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (345)	76:15	18:33
114	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (346)	17:55	4:41
115	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (347)	0:00	0:00

Project:
715027 SS

Licensed user:
Pondera Consult B.V.
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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

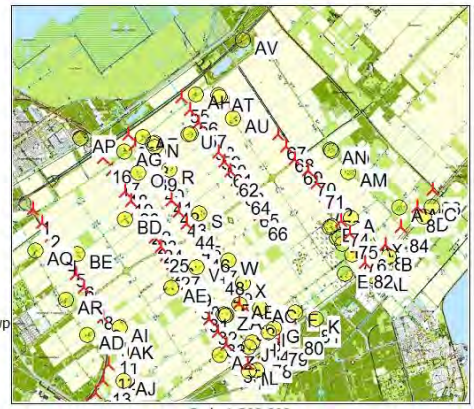
Operational time

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	Valid	WTG type Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data Calculation distance [m]	RPM [RPM]
1	149.446	487.891	-6,0	Pondera R136 4000 136.0 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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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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

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
38	153.601	489.855	-5,6	Pondera R136 4000 136.0 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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]	[°]	[°]	
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 19:18/3.0.654

SHADOW - Main Result

Calculation: SS alt 2a - referentiewoningen

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No.	X (east)	Y (north)	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction 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"

Calculation Results

Shadow receptor

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values: 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

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No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: 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	93:38	178	0:50	20:49
O	135:07	302	0:57	28:24
P	40:55	110	0:45	8:34
Q	124:21	215	0:56	27:53
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	33:34	99	0:41	7:17
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	240:53	308	1:14	50:17
AG	128:57	216	1:10	24:51
AH	146:55	179	0:59	27:36
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	44:58	130	0:29	7:53
AT	40:46	140	0:29	7:18
AU	19:47	108	0:24	3:41
AV	0:00	0	0:00	0:00
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	Worst case [h/year]	Expected [h/year]
1	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (348)	0:00	0:00
2	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (349)	0:00	0:00

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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	Worst case [h/year]	Expected [h/year]
3	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (350)	12:01	2:37
4	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (351)	85:04	19:40
5	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (352)	80:16	17:30
6	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (353)	32:50	4:40
7	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (354)	1:54	0:29
8	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (355)	12:14	2:30
9	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (356)	20:26	4:17
10	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (357)	101:34	23:53
11	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (358)	198:47	43:11
12	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (359)	69:36	9:44
13	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (360)	30:43	7:22
14	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (361)	12:17	2:36
15	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (362)	31:29	7:30
16	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (363)	52:59	10:18
17	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (364)	74:08	12:58
18	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (365)	28:25	6:01
19	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (366)	32:30	4:49
20	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (367)	0:00	0:00
21	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (368)	1:50	0:28
22	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (369)	22:39	5:19
23	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (370)	7:42	1:24
24	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (371)	2:08	0:22
25	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (372)	0:00	0:00
26	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (373)	3:07	0:42
27	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (374)	7:59	1:53
28	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (375)	15:35	3:15
29	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (376)	81:10	17:21
30	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (377)	40:58	8:18
31	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (378)	61:31	13:16
32	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (379)	82:04	17:58
33	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (380)	173:22	28:28
34	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (381)	44:44	10:29
35	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (382)	144:57	31:09
36	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (383)	146:33	33:49
37	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (384)	163:15	37:25
38	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (385)	245:42	48:52
39	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (386)	44:33	10:45
40	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (387)	54:30	11:24
41	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (388)	3:36	0:37
42	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (389)	6:03	1:23
43	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (390)	16:30	3:54
44	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (391)	38:13	7:15
45	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (392)	0:00	0:00
46	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (393)	34:02	7:37
47	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (394)	41:09	9:50
48	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (395)	122:29	27:05
49	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (396)	89:08	17:14
50	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (397)	90:30	19:45
51	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (398)	75:45	13:58
52	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (399)	219:57	43:56
53	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (400)	226:37	41:05
54	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (401)	174:04	37:27
55	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (402)	67:13	15:38
56	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (403)	106:01	17:14
57	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (404)	46:05	7:23
58	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (405)	40:13	9:05
59	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (406)	21:54	3:41
60	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (407)	3:51	0:38
61	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (408)	0:00	0:00
62	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (409)	0:00	0:00
63	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (410)	0:00	0:00
64	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (411)	0:00	0:00
65	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (412)	0:00	0:00
66	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (413)	0:00	0:00
67	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (414)	0:00	0:00

To be continued on next page...

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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

...continued from previous page

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

Project:
715027 SS

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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

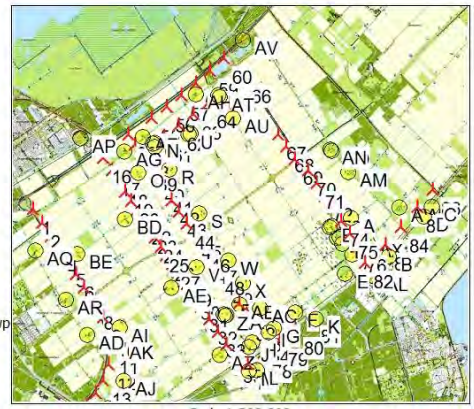
Operational time

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	Valid	WTG type Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data Calculation distance [m]	RPM [RPM]
1	149.446	487.891	-6,0	Pondera R136 4000 136.0 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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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SHADOW - Main Result

Calculation: SS alt 2b - referentiewoningen

...continued from previous page

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
38	153.601	489.855	-5,6	Pondera R136 4000 136.0 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
55	154.017	491.159	-6,0	Pondera R136 4000 136.0 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
56	154.587	491.564	-6,0	Pondera R136 4000 136.0 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
57	155.155	491.973	-5,9	Pondera R136 4000 136.0 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
58	155.715	492.393	-5,0	Pondera R136 4000 136.0 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
59	156.252	492.841	-2,7	Pondera R136 4000 136.0 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
60	156.787	493.293	-4,9	Pondera R136 4000 136.0 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
61	154.480	490.485	-5,0	Pondera R136 4000 136.0 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
62	155.051	490.890	-6,0	Pondera R136 4000 136.0 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
63	155.623	491.294	-5,5	Pondera R136 4000 136.0 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
64	156.195	491.698	-5,8	Pondera R136 4000 136.0 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
65	156.927	492.202	-6,5	Pondera R136 4000 136.0 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	0,0
66	157.516	492.617	-4,5	Pondera R136 4000 136.0 !O! ...	Yes	Pondera	R136-4.000	4.000	136,0	155,0	1.632	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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 !O! ...	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]	[°]	[°]	
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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NL-7556 PE Hengelo
0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
29-9-2016 19:40/3.0.654

SHADOW - Main Result

Calculation: SS alt 2b - referentiewoningen

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No.	X (east)	Y (north)	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction 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"

Calculation Results

Shadow receptor

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values: 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

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No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: 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	Worst case [h/year]	Expected [h/year]
1	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (434)	0:00	0:00
2	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (435)	0:00	0:00

To be continued on next page...

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

SHADOW - Main Result

Calculation: SS alt 2b - referentiewoningen

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

To be continued on next page...

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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 !O! hub: 155,0 m (TOT: 223,0 m) (501)	0:00	0:00
69	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (502)	8:53	1:52
70	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (503)	30:20	5:38
71	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (504)	8:47	1:51
72	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (505)	4:04	0:36
73	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (506)	37:11	8:19
74	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (507)	155:51	37:34
75	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (508)	198:30	46:34
76	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (509)	139:53	29:08
77	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (510)	151:27	22:33
78	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (511)	181:57	31:13
79	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (512)	242:02	43:00
80	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (513)	32:23	7:15
81	LAGERWEY L100-2.5MW 2520 100.0 !O! hub: 90,0 m (TOT: 140,0 m) (514)	117:21	25:15
82	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (515)	83:36	17:16
83	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (516)	48:06	11:14
84	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (517)	85:18	15:17
85	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (518)	103:33	25:16
86	Pondera R136 4000 136.0 !O! hub: 155,0 m (TOT: 223,0 m) (519)	20:43	5:26

Project:
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Calculated:
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

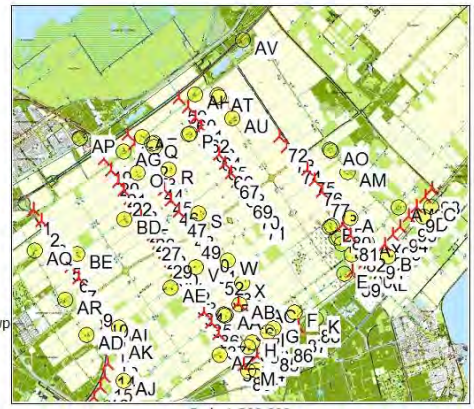
Operational time

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



Scale 1:200.000

New WTG Shadow receptor

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

SHADOW - Main Result

Calculation: SS alt 3a - referentiewoningen

...continued from previous page

					WTG type							Shadow data	
	X (east)	Y (north)	Z [m]	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM [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

Licensed user:
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Calculated:
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: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: 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	70:53	155	0:44	15:36
O	107:48	259	0:54	22:04
P	88:59	178	0:59	21:06
Q	93:32	181	0:49	20:49
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	70:55	150	0:50	17:09
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	174:17	244	1:06	36:18
AG	103:13	214	0:44	19:39
AH	111:40	176	0:55	20:33
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	19:16	72	0:25	3:24
AT	17:37	65	0:25	3:14
AU	15:03	79	0:18	2:31
AV	0:00	0	0:00	0:00
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 20:02/3.0.654

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 !O! hub: 141,5 m (TOT: 200,0 m) (520)	0:00	0:00
2	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (521)	0:00	0:00
3	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (522)	0:00	0:00
4	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (523)	72:04	17:07
5	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (524)	59:25	13:56
6	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (525)	90:06	14:35
7	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (526)	0:00	0:00
8	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (527)	39:17	10:16
9	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (528)	9:35	2:05
10	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (529)	0:00	0:00
11	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (530)	115:00	26:40
12	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (531)	70:06	15:17
13	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (532)	141:59	30:11
14	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (533)	55:00	7:40
15	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (534)	34:57	8:04
16	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (535)	15:30	3:16
17	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (536)	6:44	1:23
18	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (537)	20:28	4:52
19	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (538)	31:29	5:52
20	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (539)	58:22	9:58
21	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (540)	20:45	4:22
22	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (541)	32:04	4:48
23	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (542)	0:00	0:00
24	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (543)	0:00	0:00
25	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (544)	29:49	7:24
26	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (545)	10:05	1:53
27	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (546)	3:11	0:33
28	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (547)	0:00	0:00
29	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (548)	2:07	0:29
30	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (549)	6:23	1:28
31	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (550)	13:32	2:51
32	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (551)	31:26	6:10
33	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (552)	40:32	7:56
34	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (553)	42:57	9:09
35	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (554)	44:16	10:25
36	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (555)	76:46	16:15
37	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (556)	100:20	16:04
38	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (557)	33:32	7:43
39	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (558)	114:45	24:59
40	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (559)	99:08	22:58
41	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (560)	128:43	29:18
42	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (561)	189:27	37:41
43	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (562)	41:45	10:01
44	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (563)	54:46	11:28
45	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (564)	3:36	0:37
46	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (565)	6:12	1:25
47	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (566)	16:33	3:55
48	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (567)	38:36	7:23
49	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (568)	0:00	0:00
50	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (569)	27:17	6:06
51	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (570)	30:26	7:15
52	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (571)	96:07	21:09
53	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (572)	58:11	11:39
54	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (573)	67:21	14:44
55	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (574)	49:20	9:16
56	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (575)	169:37	33:00
57	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (576)	179:52	33:00
58	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (577)	119:15	26:06
59	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (578)	30:48	6:49
60	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (579)	92:14	15:54
61	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (580)	18:56	3:03
62	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (581)	58:56	15:22
63	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (582)	33:43	7:01
64	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (583)	19:39	3:12
65	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (584)	1:51	0:16

To be continued on next page...

Project:
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SHADOW - Main Result

Calculation: SS alt 3a - referentiewoningen

...continued from previous page

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

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 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

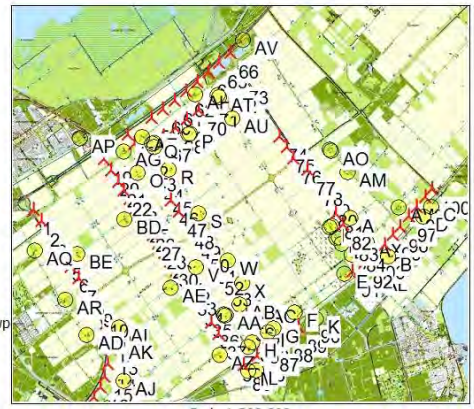
Operational time

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	Valid	WTG type Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data Calculation distance [m]	RPM [RPM]
1	149.490	487.866	-6,0	VESTAS V117-3.3 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..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 GridS..Yes		VESTAS	V117-3.3 GridStreame-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		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

Licensed user:
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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

					WTG type							Shadow data	
	X (east)	Y (north)	Z [m]	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM [RPM]
39	157.184	482.600	-5,3	VESTAS V117-3.3 GridS..	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 GridS..	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 GridS..	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 GridS..	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 GridS..	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 GridS..	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 GridS..	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 GridS..	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 GridS..	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 GridS..	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 GridS..	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 GridS..	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 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
59	154.015	491.149	-6,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
60	154.470	491.458	-6,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
61	154.914	491.782	-5,9	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
62	155.360	492.105	-5,8	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
63	155.798	492.436	-5,2	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
64	156.217	492.794	-4,3	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
65	156.640	493.145	-6,4	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
66	157.058	493.502	-4,9	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
67	154.489	490.482	-5,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
68	154.939	490.798	-4,7	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
69	155.388	491.115	-5,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
70	155.837	491.432	-5,9	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
71	156.286	491.750	-4,9	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
72	156.985	492.243	-4,3	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
73	157.434	492.560	-5,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
74	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
75	159.225	490.099	-6,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
76	159.497	489.701	-6,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
77	160.029	489.298	-5,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
78	160.305	488.905	-4,9	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
79	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
80	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
81	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
82	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
83	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
84	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
85	157.577	482.286	-3,4	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
86	158.096	482.618	-5,6	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
87	158.627	482.957	-4,2	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
88	159.158	483.296	-2,3	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
89	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
90	160.202	484.002	-1,1	LAGERWEY L100-2.5M...	Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1.200	15,2
91	161.774	485.640	-4,0	LAGERWEY L100-2.5M...	Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1.200	15,2
92	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
93	162.702	486.299	-4,3	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
94	163.007	486.607	-4,2	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
95	163.321	486.952	-4,6	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
96	163.598	487.256	-5,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
97	163.941	487.636	-5,0	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
98	164.244	487.970	-4,7	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
99	164.558	488.317	-4,7	VESTAS V117-3.3 GridS..	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
100	164.818	488.603	-4,6	VESTAS V117-3.3 GridS..	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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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 [m]	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"
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: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: 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	Worst case [h/year]	Expected [h/year]
1	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (618)	0:00	0:00
2	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (619)	0:00	0:00
3	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (620)	0:00	0:00
4	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (621)	72:04	17:07
5	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (622)	59:25	13:56
6	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (623)	90:06	14:35
7	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (624)	0:00	0:00
8	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (625)	39:17	10:16
9	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (626)	9:35	2:05
10	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (627)	0:00	0:00
11	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (628)	115:00	26:40
12	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (629)	70:06	15:17
13	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (630)	141:59	30:11
14	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (631)	55:00	7:40
15	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (632)	34:57	8:04
16	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (633)	15:30	3:16
17	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (634)	6:44	1:23
18	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (635)	20:28	4:52
19	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (636)	31:29	5:52
20	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (637)	58:22	9:58
21	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (638)	20:45	4:22
22	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (639)	32:04	4:48
23	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (640)	0:00	0:00
24	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (641)	0:00	0:00
25	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (642)	29:49	7:24
26	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (643)	10:05	1:53
27	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (644)	3:11	0:33
28	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (645)	0:00	0:00
29	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (646)	2:07	0:29
30	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (647)	6:23	1:28
31	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (648)	13:32	2:51
32	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (649)	31:26	6:10
33	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (650)	40:32	7:56
34	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (651)	42:57	9:09
35	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (652)	44:16	10:25
36	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (653)	76:46	16:15
37	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (654)	100:20	16:04
38	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (655)	33:32	7:43
39	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (656)	114:45	24:59
40	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (657)	99:08	23:05
41	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (658)	128:43	29:18
42	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (659)	189:27	37:41
43	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (660)	41:45	10:01
44	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (661)	54:46	11:28
45	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (662)	3:36	0:37
46	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (663)	6:12	1:25
47	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (664)	16:33	3:55
48	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (665)	38:36	7:23
49	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (666)	0:00	0:00
50	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (667)	27:17	6:06
51	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (668)	30:26	7:15
52	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (669)	96:07	21:09
53	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (670)	58:11	11:39
54	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (671)	67:21	14:44
55	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (672)	49:20	9:16
56	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (673)	169:37	33:00
57	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (674)	179:52	33:00
58	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (675)	119:15	26:06
59	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (676)	0:00	0:00
60	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (677)	5:22	1:03
61	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (678)	19:52	4:00
62	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (679)	85:44	18:59
63	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (680)	18:34	4:06
64	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (681)	0:00	0:00
65	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (682)	11:30	1:49

To be continued on next page...

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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 !O! hub: 141,5 m (TOT: 200,0 m) (683)	38:42	7:15
67	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (684)	39:23	9:03
68	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (685)	92:20	20:55
69	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (686)	3:25	0:26
70	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (687)	100:37	16:08
71	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (688)	178:03	40:03
72	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (689)	6:59	1:44
73	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (690)	0:03	0:00
74	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (691)	0:00	0:00
75	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (692)	0:00	0:00
76	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (693)	0:00	0:00
77	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (694)	19:58	3:30
78	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (695)	9:42	1:45
79	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (696)	3:22	0:36
80	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (697)	2:57	0:38
81	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (698)	61:42	13:43
82	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (699)	190:24	42:35
83	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (700)	176:02	41:08
84	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (701)	141:25	29:29
85	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (702)	132:07	23:53
86	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (703)	191:07	30:06
87	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (704)	170:22	27:36
88	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (705)	114:01	22:31
89	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (706)	68:10	12:07
90	LAGERWEY L100-2.5MW 2520 100.0 !O! hub: 90,0 m (TOT: 140,0 m) (707)	32:53	6:41
91	LAGERWEY L100-2.5MW 2520 100.0 !O! hub: 90,0 m (TOT: 140,0 m) (708)	149:06	37:29
92	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (709)	82:08	16:35
93	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (710)	168:00	34:23
94	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (711)	35:51	8:24
95	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (712)	22:06	5:15
96	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (713)	47:12	7:55
97	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (714)	120:36	25:39
98	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (715)	78:12	19:04
99	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (716)	17:52	4:41
100	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (717)	0:00	0:00

Project:
715027 SS

Licensed user:
Pondera Consult B.V.
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NL-7556 PE Hengelo
0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
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

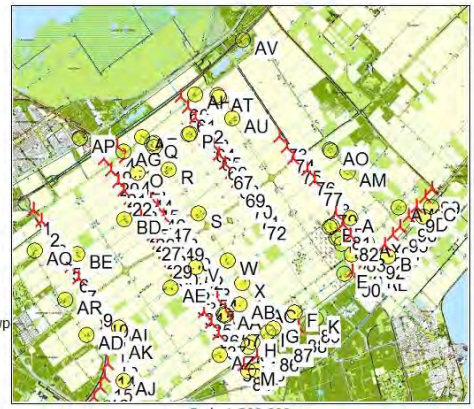
Operational time

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



Scale 1:200.000
New WTG Shadow receptor

WTGs

	X (east)	Y (north)	Z [m]	Row data/Description	Valid	WTG type Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data Calculation distance [m]	RPM [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

Licensed user:
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0031742489940
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Calculated:
29-9-2016 20:45/3.0.654

SHADOW - Main Result

Calculation: SS alt 3c - referentiewoningen

...continued from previous page

					WTG type							Shadow data	
	X (east)	Y (north)	Z [m]	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM [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	152.694	490.161	-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	152.993	489.735	-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
42	153.283	489.328	-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
43	153.525	488.985	-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
44	153.766	488.641	-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
45	154.008	488.297	-6,3	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
46	154.250	487.954	-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
47	154.491	487.610	-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
48	154.733	487.267	-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
49	154.974	486.923	-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
50	155.216	486.580	-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
51	155.458	486.236	-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
52	155.700	485.893	-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
53	155.988	485.484	-5,1	VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
54	156.275	485.075	-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
55	156.563	484.666	-7,0	VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
56	156.851	484.257	-6,9	VESTAS V117-3.3 GridSt...	Yes	VESTAS	V117-3.3 GridStreame-3.300	3.300	117,0	141,5	1.404	13,1
57	157.138	483.848	-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
58	157.426	483.440	-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
59	157.714	483.031	-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
60	155.145	491.930	-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
61	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
62	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
63	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
64	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
65	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
66	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
67	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
68	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
69	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
70	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
71	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
72	158.144	487.682	-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
73	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
74	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
75	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
76	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
77	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
78	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
79	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
80	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
81	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
82	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
83	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
84	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
85	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
86	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
87	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
88	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
89	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
90	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
91	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
92	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
93	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
94	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
95	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
96	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
97	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
98	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
99	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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Calculated:
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 [m]	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"
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 20:45/3.0.654

SHADOW - Main Result

Calculation: SS alt 3c - referentiewoningen

Calculation Results

Shadow receptor

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values: 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	128:59	189	1:12	22:43
H	465:40	334	2:23	102:08
I	170:02	224	1:28	28:19
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	21:26	89	0:25	3:39
O	498:21	231	3:14	83:58
P	88:59	178	0:59	21:06
Q	35:41	127	0:26	6:15
R	12:14	69	0:18	2:30
S	10:28	68	0:18	1:50
T	20:49	75	0:27	3:41
U	70:55	150	0:50	17:09
V	196:52	256	1:53	33:39
W	38:08	116	0:27	6:46
X	38:14	117	0:27	6:46
Y	224:44	325	1:54	42:25
Z	265:44	336	2:03	50:07
AA	248:24	296	2:03	45:11
AB	165:53	295	1:10	31:57
AC	45:41	130	0:47	7:29
AD	79:21	202	0:36	16:11
AE	47:58	126	0:40	10:29
AF	35:26	103	0:30	6:11
AG	329:15	221	2:34	62:42
AH	123:43	186	0:55	23:57
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	19:16	72	0:25	3:24
AT	17:37	65	0:25	3:14
AU	15:03	79	0:18	2:31
AV	0:00	0	0:00	0:00
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	76:30	155	0:52	17:42
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	45:23	126	0:44	10:25
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 20:45/3.0.654

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 !O! hub: 141,5 m (TOT: 200,0 m) (718)	0:00	0:00
2	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (719)	0:00	0:00
3	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (720)	0:00	0:00
4	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (721)	72:04	17:07
5	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (722)	59:25	13:56
6	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (723)	90:06	14:35
7	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (724)	0:00	0:00
8	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (725)	39:17	10:16
9	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (726)	9:35	2:05
10	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (727)	0:00	0:00
11	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (728)	115:00	26:40
12	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (729)	70:06	15:17
13	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (730)	141:59	30:11
14	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (731)	55:00	7:40
15	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (732)	34:57	8:04
16	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (733)	15:30	3:16
17	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (734)	6:44	1:23
18	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (735)	20:28	4:52
19	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (736)	31:29	5:52
20	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (737)	58:22	9:30
21	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (738)	20:45	4:19
22	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (739)	32:04	4:23
23	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (740)	0:00	0:00
24	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (741)	0:00	0:00
25	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (742)	29:49	7:24
26	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (743)	10:05	1:53
27	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (744)	3:11	0:33
28	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (745)	0:00	0:00
29	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (746)	2:07	0:29
30	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (747)	6:23	1:28
31	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (748)	13:32	2:52
32	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (749)	31:26	5:38
33	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (750)	40:32	7:46
34	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (751)	42:57	9:09
35	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (752)	44:16	10:24
36	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (753)	76:46	15:20
37	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (754)	100:20	15:53
38	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (755)	33:32	7:44
39	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (756)	114:45	24:59
40	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (757)	16:46	3:35
41	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (758)	248:40	51:20
42	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (759)	98:03	14:33
43	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (760)	386:55	66:11
44	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (761)	53:35	7:24
45	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (762)	0:00	0:00
46	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (763)	2:18	0:35
47	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (764)	1:20	0:16
48	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (765)	3:11	0:39
49	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (766)	5:57	0:53
50	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (767)	0:00	0:00
51	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (768)	0:00	0:00
52	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (769)	6:24	1:21
53	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (770)	111:37	21:06
54	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (771)	87:10	13:54
55	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (772)	47:25	9:25
56	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (773)	62:50	12:13
57	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (774)	223:21	41:43
58	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (775)	93:53	14:11
59	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (776)	342:06	82:08
60	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (777)	42:51	10:07
61	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (778)	92:14	15:54
62	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 141,5 m (TOT: 200,0 m) (779)	18:56	3:03
63	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (780)	58:56	15:22
64	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (781)	33:43	7:01
65	Siemens SWT-3.2-113 2A 3200 113.0 !O! hub: 92,5 m (TOT: 149,0 m) (782)	19:39	3:12

To be continued on next page...

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715027 SS

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

SHADOW - Main Result

Calculation: SS alt 3c - referentiewoningen

...continued from previous page

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

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715027 SS

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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

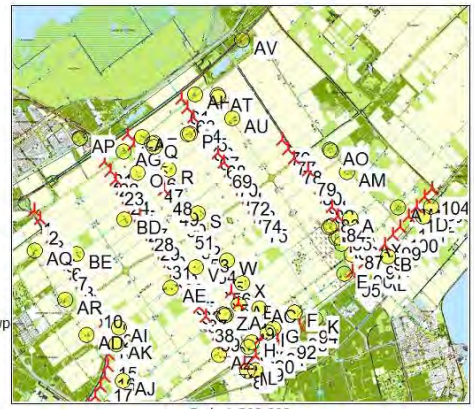
Operational time

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



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 [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...

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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 [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 [RPM]
38	156.117	484.017	-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
39	156.352	483.693	-5,7	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
40	156.587	483.370	-6,6	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
41	156.821	483.046	-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
42	157.056	482.722	-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
43	153.106	490.559	-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
44	153.352	490.209	-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
45	153.599	489.857	-5,6	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
46	153.897	489.433	-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
47	154.184	489.024	-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
48	154.506	488.575	-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
49	154.766	488.185	-6,6	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
50	155.058	487.781	-6,4	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
51	155.358	487.353	-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
52	155.612	487.002	-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
53	155.936	486.530	-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
54	156.228	486.115	-5,7	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
55	156.510	485.714	-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
56	156.802	485.298	-6,4	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
57	157.085	484.895	-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
58	157.367	484.494	-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
59	157.672	484.060	-6,4	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
60	157.935	483.686	-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
61	155.179	491.839	-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
62	158.234	483.261	-5,6	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
63	155.411	491.513	-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
64	155.643	491.187	-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
65	155.876	490.862	-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
66	156.108	490.536	-4,8	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
67	156.340	490.211	-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
68	156.573	489.885	-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
69	156.805	489.559	-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
70	157.037	489.234	-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
71	157.270	488.908	-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
72	157.502	488.583	-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
73	157.735	488.257	-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
74	157.967	487.931	-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
75	158.199	487.606	-4,5	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
76	159.054	490.360	-5,6	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
77	159.284	490.033	-4,9	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
78	159.514	489.706	-4,9	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
79	160.060	489.271	-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
80	160.291	488.944	-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
81	160.521	488.617	-5,6	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
82	160.751	488.290	-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
83	160.982	487.963	-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
84	161.212	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
85	161.443	487.309	-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
86	161.673	486.982	-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
87	161.900	486.653	-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
88	157.617	482.350	-1,9	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
89	158.038	482.619	-6,6	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
90	158.460	482.888	-1,5	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
91	158.881	483.157	-2,0	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
92	159.302	483.426	-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
93	159.724	483.696	-3,2	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
94	160.133	483.983	-2,9	LAGERWEY L100-2.5MW 252...	Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1.200	15,2
95	161.774	485.640	-4,0	LAGERWEY L100-2.5MW 252...	Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1.200	15,2
96	162.226	485.967	-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
97	162.702	486.299	-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
98	163.007	486.607	-4,2	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
99	163.321	486.952	-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
100	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

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Project:
715027 SS

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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 Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
101	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
102	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
103	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
104	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	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"

To be continued on next page...

Project:
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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 cw	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 hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: 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

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SHADOW - Main Result

Calculation: SS alt 4a - referentiewoningen

...continued from previous page

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

To be continued on next page...

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 21:07/3.0.654

SHADOW - Main Result

Calculation: SS alt 4a - referentiewoningen

...continued from previous page

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

Project:
715027 SS

Licensed user:
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0031742489940
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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

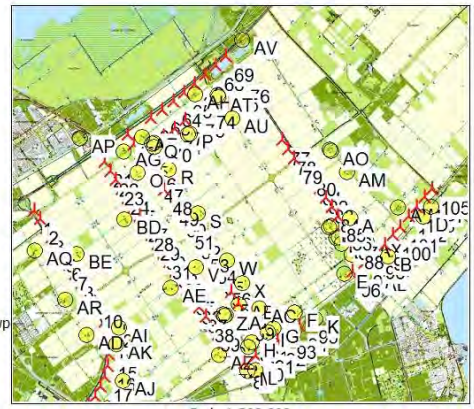
Operational time

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



Scale 1:200.000
New WTG
Shadow receptor

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 [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 21:29/3.0.654

SHADOW - Main Result

Calculation: SS alt 4b - referentiewoningen

...continued from previous page

	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 [RPM]
38	156.117	484.017	-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
39	156.352	483.693	-5,7	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
40	156.587	483.370	-6,6	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
41	156.821	483.046	-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
42	157.056	482.722	-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
43	153.106	490.559	-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
44	153.352	490.209	-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
45	153.599	489.857	-5,6	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
46	153.897	489.433	-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
47	154.184	489.024	-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
48	154.506	488.575	-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
49	154.766	488.185	-6,6	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
50	155.058	487.781	-6,4	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
51	155.358	487.353	-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
52	155.612	487.002	-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
53	155.936	486.530	-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
54	156.228	486.115	-5,7	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
55	156.510	485.714	-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
56	156.802	485.298	-6,4	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
57	157.085	484.895	-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
58	157.367	484.494	-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
59	157.672	484.060	-6,4	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
60	157.935	483.686	-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
61	158.234	483.261	-5,6	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
62	154.013	491.150	-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
63	154.440	491.448	-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
64	154.864	491.748	-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
65	155.279	492.062	-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
66	155.696	492.373	-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
67	156.095	492.706	-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
68	156.500	493.032	-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
69	156.900	493.379	-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
70	154.489	490.482	-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
71	154.915	490.781	-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
72	155.339	491.081	-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
73	155.764	491.381	-6,6	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
74	156.189	491.681	-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
75	157.071	492.304	-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
76	157.496	492.604	-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
77	159.054	490.360	-5,6	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
78	159.284	490.033	-4,9	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
79	159.514	489.706	-4,9	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
80	160.060	489.271	-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
81	160.291	488.944	-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
82	160.521	488.617	-5,6	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
83	160.751	488.290	-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
84	160.982	487.963	-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
85	161.212	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
86	161.443	487.309	-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
87	161.673	486.982	-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
88	161.900	486.653	-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
89	157.617	482.350	-1,9	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
90	158.038	482.619	-6,6	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
91	158.460	482.888	-1,5	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
92	158.881	483.157	-2,0	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
93	159.302	483.426	-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
94	159.724	483.696	-3,2	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
95	160.133	483.983	-2,9	LAGERWEY L100-2.5MW 252...	Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1.200	15,2
96	161.774	485.640	-4,0	LAGERWEY L100-2.5MW 252...	Yes	LAGERWEY	L100-2.5MW-2.520	2.520	100,0	90,0	1.200	15,2
97	162.226	485.967	-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
98	162.702	486.299	-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
99	163.007	486.607	-4,2	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
100	163.321	486.952	-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

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Project:
715027 SS

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

SHADOW - Main Result

Calculation: SS alt 4b - referentiewoningen

...continued from previous page

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[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	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"

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

To be continued on next page...

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

SHADOW - Main Result

Calculation: SS alt 4b - referentiewoningen

...continued from previous page

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

Project:
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Calculated:
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

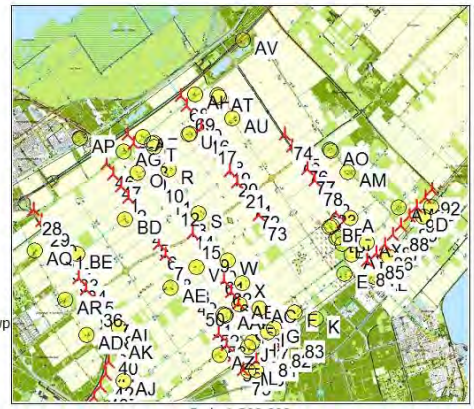
Operational time

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	Valid	WTG type Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data Calculation distance [m]	RPM [RPM]
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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0031742489940
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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 Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
39	152.373	483.308	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
68	155.137	491.948	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 I	..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 !O! h	...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 !O! h	...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 !O! h	...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 !O! h	...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 !O! h	...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 !O! h	...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 !O! h	...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 !O! h	...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 !O! h	...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]	[°]	[°]	
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

Licensed user:
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0031742489940
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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 [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction 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 14:01/3.0.654

SHADOW - Main Result

Calculation: SS VKA - referentiewoningen

Calculation Results

Shadow receptor

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

Project:
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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	Worst case [h/year]	Expected [h/year]
1	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1027)	18:23	3:25
2	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1028)	0:00	0:00
3	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1029)	0:00	0:00
4	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1030)	19:06	4:09
5	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1031)	5:03	0:53
6	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1032)	0:00	0:00
7	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1033)	3:13	0:43
8	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1034)	11:17	2:35
9	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1035)	46:22	11:19
10	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1036)	58:48	12:13
11	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1037)	4:19	0:50
12	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1038)	7:03	1:36
13	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1039)	17:38	4:10
14	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1040)	41:11	7:52
15	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1041)	0:00	0:00
16	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1042)	77:26	20:10
17	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1043)	28:50	5:33
18	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1044)	6:56	1:13
19	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1045)	0:00	0:00
20	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1046)	0:00	0:00
21	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1047)	0:00	0:00
22	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1048)	3:33	0:38
23	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1049)	2:37	0:33
24	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1050)	67:46	15:03
25	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1051)	213:19	48:35
26	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1052)	199:21	46:39
27	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1053)	152:23	32:02
28	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1054)	0:00	0:00
29	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1055)	0:00	0:00
30	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1056)	0:00	0:00
31	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1057)	56:16	13:20
32	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1058)	59:53	13:36
33	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1059)	89:59	13:41
34	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1060)	0:00	0:00
35	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1061)	37:49	9:54
36	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1062)	5:38	1:12
37	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1063)	1:33	0:16
38	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1064)	124:27	29:06
39	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1065)	82:08	16:32
40	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1066)	160:36	34:14
41	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1067)	40:00	5:36
42	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1068)	38:44	8:42
43	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1069)	12:10	2:34
44	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1070)	3:30	0:43
45	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1071)	17:33	4:08
46	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1072)	28:13	5:22
47	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1073)	12:59	2:39
48	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1074)	30:03	5:58
49	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1075)	25:45	5:27
50	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1076)	20:35	4:20
51	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1077)	33:19	7:43
52	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1078)	75:34	15:38
53	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1079)	36:51	5:55
54	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1080)	24:46	5:41
55	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1081)	112:03	24:23
56	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1082)	72:55	16:58
57	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1083)	136:48	29:24
58	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1084)	148:11	29:40
59	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1085)	13:58	3:10
60	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1086)	37:48	9:13
61	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1087)	90:26	18:53
62	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1088)	31:26	7:15
63	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1089)	65:30	13:29
64	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1090)	26:44	6:24
65	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1091)	200:40	33:58

To be continued on next page...

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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 !O! hub: 95,0 m (TOT: 160,0 m) (1092)	153:21	29:50
67	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1093)	165:13	37:27
68	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1094)	44:21	10:10
69	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1095)	109:12	17:57
70	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1096)	11:16	1:57
71	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1097)	0:00	0:00
72	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1098)	0:00	0:00
73	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1099)	0:00	0:00
74	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1100)	0:00	0:00
75	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1101)	1:44	0:23
76	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1102)	6:40	1:23
77	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1103)	12:40	2:12
78	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1104)	2:27	0:30
79	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1105)	333:09	75:31
80	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1106)	93:53	12:16
81	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1107)	38:40	7:23
82	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1108)	123:00	18:48
83	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1109)	39:54	8:18
84	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1110)	65:58	14:11
85	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1111)	142:40	28:11
86	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1112)	20:20	4:32
87	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1113)	8:19	2:05
88	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1114)	9:35	2:01
89	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1115)	90:16	18:31
90	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1116)	55:22	13:19
91	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1117)	8:45	2:17
92	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1118)	0:00	0:00

Project:
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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

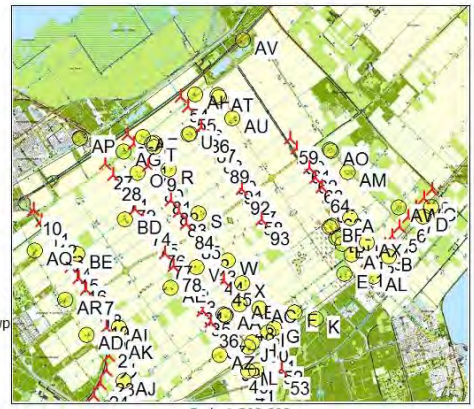
Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
410	492	775	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 Shadow receptor

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 [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...

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 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 Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[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]	[°]	[°]	
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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0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
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 [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction 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 12:43/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - referentiewoningen

Calculation Results

Shadow receptor

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

Project:
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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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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 !O! hub: 94,0 m (TOT: 160,0 m) (1480)	9:52	2:11
67	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1481)	173:05	39:46
68	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1482)	281:28	51:25
69	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1483)	160:06	36:18
70	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1484)	247:39	55:32
71	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1485)	16:59	3:11
72	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1486)	0:00	0:00
73	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1487)	0:00	0:00
74	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1488)	22:56	5:09
75	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1489)	5:56	1:03
76	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1490)	0:00	0:00
77	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1491)	2:45	0:37
78	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1492)	10:58	2:32
79	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1493)	46:47	11:26
80	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1494)	58:04	12:03
81	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1495)	4:22	0:51
82	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1496)	6:41	1:31
83	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1497)	17:24	4:07
84	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1498)	40:48	7:47
85	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1499)	0:00	0:00
86	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1500)	63:45	16:38
87	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1501)	30:55	6:06
88	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1502)	8:37	1:31
89	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1503)	0:00	0:00
90	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1504)	0:00	0:00
91	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1505)	0:00	0:00
92	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1506)	0:00	0:00
93	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1507)	0:00	0:00

Project:
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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

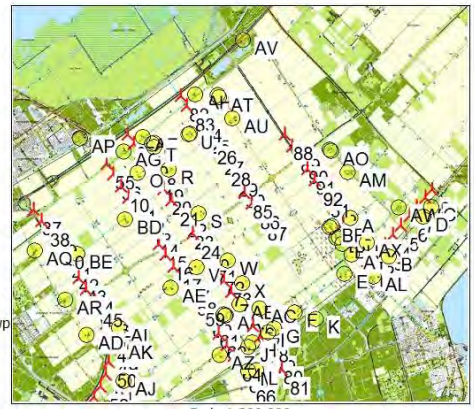
Operational time

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	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	162.318	486.025	-6,0	SENVION MM100 2000 100.0 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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

Licensed user:
Pondera Consult B.V.
Welbergweg 49
NL-7556 PE Hengelo
0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
29-9-2016 13:38/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - referentiewoningen

...continued from previous page

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
39	150.061	487.045	-6,4	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
40	150.347	486.635	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
41	150.632	486.225	-5,6	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
42	150.918	485.814	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
43	151.203	485.404	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
44	151.489	484.993	-5,2	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
45	151.817	484.559	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
46	152.069	484.174	-5,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
47	152.254	483.753	-5,5	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
48	152.373	483.308	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
49	152.409	482.846	-4,7	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
50	152.367	482.383	-5,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
51	152.247	481.935	-5,7	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
52	152.053	481.518	-4,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
53	151.791	481.135	-3,3	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
54	151.495	480.780	-5,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
55	152.276	489.508	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
56	152.547	489.127	-6,9	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
57	155.165	485.402	-5,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
58	155.464	484.974	-6,1	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
59	155.747	484.584	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
60	156.035	484.187	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
61	156.325	483.792	-5,6	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
62	156.609	483.393	-6,5	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
63	156.897	482.997	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
64	157.184	482.600	-5,3	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
65	157.457	482.203	-5,9	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
66	157.727	481.826	-5,2	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
67	153.109	490.563	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
68	153.336	490.229	-6,6	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
69	153.602	489.860	-5,7	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
70	155.939	486.534	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
71	156.231	486.119	-5,8	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
72	156.513	485.718	-5,6	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
73	156.805	485.302	-6,3	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
74	157.088	484.899	-6,8	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
75	157.370	484.498	-5,9	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
76	157.675	484.064	-6,3	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
77	157.938	483.689	-5,4	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
78	158.213	483.301	-5,8	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
79	158.499	482.893	-2,1	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
80	158.769	482.512	-5,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
81	159.035	482.134	-5,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
82	155.137	491.948	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
83	155.387	491.595	-4,8	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
84	155.660	491.206	-5,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
85	157.593	488.458	-5,7	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
86	157.869	488.066	-4,9	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
87	158.148	487.668	-6,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
88	159.143	490.558	-5,0	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
89	159.439	490.135	-6,3	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
90	159.751	489.692	-3,2	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
91	160.019	489.310	-5,1	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2
92	160.295	488.917	-5,1	Siemens SWT-3.3-130 3300 130.0 I	..Yes	Siemens	SWT-3.3-130-3.300	3.300	130,0	95,0	1.560	12,2

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"

To be continued on next page...

Project:
715027 SS

Licensed user:
Pondera Consult B.V.
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NL-7556 PE Hengelo
0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
29-9-2016 13:38/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - referentiewoningen

...continued from previous page

No.	X (east)	Y (north)	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction 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 13:38/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - referentiewoningen

Calculation Results

Shadow receptor

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

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

To be continued on next page...

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29-9-2016 13:38/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
66	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1276)	432:28	76:55
67	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1277)	72:55	16:58
68	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1278)	136:48	29:24
69	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1279)	148:11	29:40
70	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1280)	13:58	3:10
71	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1281)	37:48	9:13
72	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1282)	90:26	18:53
73	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1283)	31:26	7:15
74	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1284)	65:30	13:29
75	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1285)	26:44	6:24
76	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1286)	200:40	33:58
77	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1287)	153:21	29:50
78	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1288)	165:13	37:51
79	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1289)	95:58	17:07
80	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1290)	49:57	11:20
81	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1291)	13:29	2:51
82	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1292)	44:21	10:10
83	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1293)	109:12	17:57
84	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1294)	11:16	1:57
85	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1295)	0:00	0:00
86	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1296)	0:00	0:00
87	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1297)	0:00	0:00
88	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1298)	0:00	0:00
89	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1299)	1:44	0:23
90	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1300)	6:40	1:23
91	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1301)	12:40	2:12
92	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1302)	2:27	0:30

Project:
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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

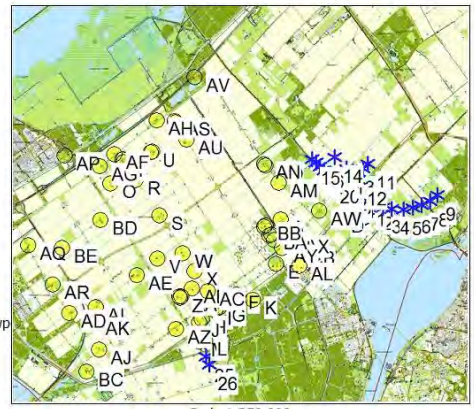
Operational time

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



Scale 1:250.000
Existing WTG Shadow receptor

WTGs

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	165.852	488.427	0,0	ENERCON E-82 E3 3000 82.0 !..	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 !..	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 !..	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 !..	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 !..	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 !..	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 !..	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 !..	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 !..	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 !..	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 !..	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]	[°]	[°]	
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

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

...continued from previous page

No.	X (east)	Y (north)	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction 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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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: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: 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

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

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

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

Project:
715027 SS

Licensed user:
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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

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

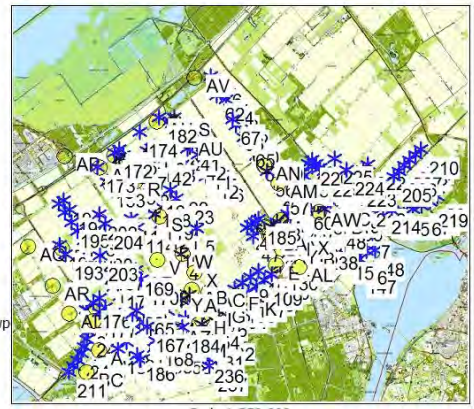
Operational time

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 1:250.000
Existing WTG Shadow receptor

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 [RPM]
1	156.437	491.929	0,0	LAGERWEY 80 18.0 !O! ...	No	LAGERWEY	-80	80	18,0	34,0	216	120,0
2	156.545	491.785	0,0	LAGERWEY 80 18.0 !O! ...	No	LAGERWEY	-80	80	18,0	34,0	216	120,0
3	154.789	489.404	0,0	LAGERWEY 80 18.0 !O! ...	No	LAGERWEY	-80	80	18,0	34,0	216	120,0
4	156.864	486.046	0,0	LAGERWEY 80 18.0 !O! ...	No	LAGERWEY	-80	80	18,0	34,0	216	120,0
5	157.629	487.200	0,0	LAGERWEY 80 18.0 !O! ...	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	54,5	55,0	654	22,4

To be continued on next page...

Project:
715027 SS

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NL-7556 PE Hengelo
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 [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 [RPM]
39	157.110	491.347	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	55,0	654	22,4
40	157.190	490.798	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	55,0	654	22,4
41	157.395	490.942	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	55,0	654	22,4
42	157.681	490.510	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	55,0	654	22,4
43	161.697	486.585	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	55,0	654	22,4
44	160.448	487.514	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	55,0	654	22,4
45	160.072	487.248	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	55,0	654	22,4
46	160.263	487.384	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	55,0	654	22,4
47	160.353	486.848	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	55,0	654	22,4
48	164.420	487.410	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
49	165.089	488.145	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
50	157.009	481.805	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
51	157.413	482.064	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
52	154.886	482.846	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
53	162.625	489.734	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
54	162.813	489.566	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
55	163.181	489.974	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
56	161.005	489.774	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
57	161.728	488.976	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
58	161.889	489.164	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
59	162.192	488.891	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
60	162.850	488.290	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
61	163.277	487.903	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
62	158.584	493.182	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
63	159.904	491.298	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
64	160.516	490.461	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
65	160.051	491.095	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
66	159.525	491.829	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
67	159.337	492.091	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
68	162.208	486.475	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
69	163.785	488.090	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
70	164.067	488.401	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
71	164.228	488.993	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	54,5	70,0	654	22,4
72	164.412	488.823	0,0	NEG MICON NM54 Power..No		NEG MICON	NM54 Power Trim-950/200	950	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 !O..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 !O..No		VESTAS	V47-660	660	47,0	38,5	564	28,5
101	163.896	486.841	0,0	VESTAS V47 660 47.0 !O..No		VESTAS	V47-660	660	47,0	55,0	564	28,5
102	154.104	482.296	0,0	VESTAS V47 660 47.0 !O..No		VESTAS	V47-660	660	47,0	55,0	564	28,5

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

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
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

To be continued on next page...

Project:
715027 SS

Licensed user:
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NL-7556 PE Hengelo
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 Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[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 !	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 !	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 !	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 !	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 !	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 !	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	164.265	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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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 Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[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]	[°]	[°]	
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"

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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 [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction 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

	Shadow, worst case			**Shadow, expected values**
No.	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...

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SHADOW - Main Result

Calculation: SS Bestaand totaal dubbeldraai - referentiewoningen

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

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SHADOW - Main Result

Calculation: SS Bestaand totaal dubbeldraai - referentiewoningen

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No.	Name	Worst case [h/year]	Expected [h/year]
35	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (35)	0:00	0:00
36	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (36)	0:00	0:00
37	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (37)	105:45	19:18
38	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (38)	0:00	0:00
39	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (39)	0:00	0:00
40	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (40)	12:22	1:38
41	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (41)	40:47	6:53
42	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (42)	0:00	0:00
43	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (43)	50:19	10:12
44	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (44)	24:56	5:48
45	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (45)	0:00	0:00
46	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (46)	5:14	1:16
47	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 55,0 m (TOT: 82,3 m) (47)	4:59	0:51
48	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (48)	113:18	18:38
49	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (49)	0:00	0:00
50	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (50)	0:00	0:00
51	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (51)	38:02	9:02
52	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (52)	0:00	0:00
53	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (53)	0:00	0:00
54	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (54)	0:00	0:00
55	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (55)	0:00	0:00
56	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (56)	146:33	21:24
57	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (57)	66:38	9:44
58	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (58)	33:04	7:25
59	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (59)	0:00	0:00
60	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (60)	0:00	0:00
61	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (61)	48:52	11:44
62	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (62)	0:00	0:00
63	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (63)	0:00	0:00
64	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (64)	0:00	0:00
65	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (65)	0:00	0:00
66	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (66)	0:00	0:00
67	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (67)	0:00	0:00
68	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (68)	122:08	24:12
69	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (69)	0:00	0:00
70	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (70)	0:00	0:00
71	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (71)	0:00	0:00
72	NEG MICON NM54 Power Trim 950-200 54.5 !O! hub: 70,0 m (TOT: 97,3 m) (72)	0:00	0:00
73	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (73)	46:56	7:53
74	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (74)	269:20	57:34
75	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (75)	27:22	5:24
76	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (76)	274:45	62:42
77	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (77)	13:19	3:12
78	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (78)	46:44	7:17
79	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (79)	169:15	30:35
80	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (80)	135:52	30:31
81	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (81)	0:00	0:00
82	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (82)	11:15	1:48
83	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (83)	0:00	0:00
84	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (84)	17:16	4:01
85	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (85)	12:39	1:35
86	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (86)	0:00	0:00
87	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (87)	0:00	0:00
88	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (88)	0:00	0:00
89	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (89)	0:00	0:00
90	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (90)	0:00	0:00
91	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (91)	28:36	5:07
92	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (92)	0:00	0:00
93	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (93)	0:00	0:00
94	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (94)	0:00	0:00
95	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (95)	15:01	3:10
96	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 70,0 m (TOT: 97,0 m) (96)	0:00	0:00
97	NORDTANK 500 41.0 !O! hub: 52,0 m (TOT: 72,5 m) (97)	0:00	0:00
98	NEG MICON NM52/900 900-200 52.0 !O! hub: 40,0 m (TOT: 66,0 m) (98)	298:14	46:06
99	NEG MICON NM52/900 900-200 52.0 !O! hub: 40,0 m (TOT: 66,0 m) (99)	219:12	49:08

To be continued on next page...

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SHADOW - Main Result

Calculation: SS Bestaand totaal dubbeldraai - referentiewoningen

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No.	Name	Worst case [h/year]	Expected [h/year]
100	VESTAS V47 660 47.0 !O! hub: 38,5 m (TOT: 62,0 m) (100)	0:00	0:00
101	VESTAS V47 660 47.0 !O! hub: 55,0 m (TOT: 78,5 m) (101)	0:00	0:00
102	VESTAS V47 660 47.0 !O! hub: 55,0 m (TOT: 78,5 m) (102)	0:00	0:00
103	VESTAS V47 660 47.0 !O! hub: 55,0 m (TOT: 78,5 m) (103)	114:56	25:23
104	VESTAS V52 850 52.0 !O! hub: 35,0 m (TOT: 61,0 m) (104)	20:00	4:01
105	VESTAS V52 850 52.0 !O! hub: 35,0 m (TOT: 61,0 m) (105)	0:00	0:00
106	VESTAS V52 850 52.0 !O! hub: 35,0 m (TOT: 61,0 m) (106)	315:31	60:51
107	VESTAS V52 850 52.0 !O! hub: 35,0 m (TOT: 61,0 m) (107)	1:39	0:25
108	VESTAS V52 850 52.0 !O! hub: 35,0 m (TOT: 61,0 m) (108)	0:00	0:00
109	VESTAS V52 850 52.0 !O! hub: 35,0 m (TOT: 61,0 m) (109)	0:00	0:00
110	VESTAS V52 850 52.0 !O! hub: 35,0 m (TOT: 61,0 m) (110)	0:00	0:00
111	VESTAS V52 850 52.0 !O! hub: 35,0 m (TOT: 61,0 m) (111)	0:00	0:00
112	VESTAS V52 850 52.0 !O! hub: 35,0 m (TOT: 61,0 m) (112)	0:00	0:00
113	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (113)	0:00	0:00
114	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (114)	0:00	0:00
115	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (115)	0:00	0:00
116	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (116)	0:00	0:00
117	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (117)	0:00	0:00
118	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (118)	0:00	0:00
119	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (119)	34:56	7:47
120	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (120)	0:00	0:00
121	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (121)	13:27	1:43
122	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (122)	0:00	0:00
123	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (123)	0:00	0:00
124	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (124)	0:00	0:00
125	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (125)	0:00	0:00
126	VESTAS V52 850 52.0 !O! hub: 36,5 m (TOT: 62,5 m) (126)	0:00	0:00
127	VESTAS V52 850 52.0 !O! hub: 40,0 m (TOT: 66,0 m) (127)	48:02	8:50
128	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (128)	68:09	9:58
129	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (129)	33:51	8:52
130	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (130)	140:14	34:34
131	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (131)	361:09	79:01
132	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (132)	9:55	2:35
133	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (133)	0:00	0:00
134	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (134)	137:07	28:15
135	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (135)	17:27	4:05
136	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (136)	153:12	21:19
137	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (137)	110:15	20:58
138	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (138)	0:00	0:00
139	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (139)	0:00	0:00
140	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (140)	78:30	17:25
141	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (141)	0:00	0:00
142	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (142)	55:59	7:22
143	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (143)	65:11	11:29
144	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (144)	0:00	0:00
145	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (145)	632:59	125:33
146	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (146)	54:28	10:29
147	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (147)	0:00	0:00
148	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (148)	0:00	0:00
149	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (149)	0:00	0:00
150	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (150)	0:00	0:00
151	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (151)	95:54	23:34
152	VESTAS V52 850 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (152)	95:31	22:34
153	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (153)	113:37	19:34
154	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (154)	290:54	61:21
155	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (155)	0:00	0:00
156	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (156)	0:00	0:00
157	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (157)	0:00	0:00
158	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (158)	0:00	0:00
159	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (159)	0:00	0:00
160	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (160)	0:00	0:00
161	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (161)	0:00	0:00
162	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (162)	0:00	0:00
163	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (163)	0:00	0:00
164	VESTAS V52 850 52.0 !O! 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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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	Worst case [h/year]	Expected [h/year]
165	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (165)	0:00	0:00
166	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (166)	0:00	0:00
167	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (167)	0:00	0:00
168	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (168)	0:00	0:00
169	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (169)	0:00	0:00
170	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (170)	49:44	9:15
171	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (171)	0:00	0:00
172	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (172)	0:00	0:00
173	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (173)	119:42	27:54
174	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (174)	0:00	0:00
175	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (175)	0:00	0:00
176	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (176)	0:00	0:00
177	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (177)	63:03	11:03
178	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (178)	0:00	0:00
179	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (179)	17:47	4:25
180	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (180)	0:00	0:00
181	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (181)	0:00	0:00
182	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (182)	0:00	0:00
183	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (183)	16:25	3:33
184	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (184)	48:34	12:30
185	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (185)	0:00	0:00
186	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (186)	0:00	0:00
187	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (187)	0:00	0:00
188	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (188)	0:00	0:00
189	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (189)	0:00	0:00
190	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (190)	0:00	0:00
191	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (191)	0:00	0:00
192	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (192)	0:00	0:00
193	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (193)	59:14	8:33
194	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (194)	0:00	0:00
195	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (195)	0:00	0:00
196	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (196)	0:00	0:00
197	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (197)	0:00	0:00
198	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (198)	0:00	0:00
199	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (199)	0:00	0:00
200	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (200)	0:00	0:00
201	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (201)	0:00	0:00
202	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (202)	0:00	0:00
203	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (203)	0:00	0:00
204	VESTAS V52 850 52.0 !O! hub: 70,0 m (TOT: 96,0 m) (204)	41:39	8:02
205	VESTAS V66 1750 66.0 !O! hub: 67,0 m (TOT: 100,0 m) (205)	0:00	0:00
206	VESTAS V66 1750 66.0 !O! hub: 67,0 m (TOT: 100,0 m) (212)	0:00	0:00
207	VESTAS V66 1750 66.0 !O! hub: 67,0 m (TOT: 100,0 m) (213)	0:00	0:00
208	VESTAS V66 1750 66.0 !O! hub: 67,0 m (TOT: 100,0 m) (214)	0:00	0:00
209	VESTAS V66 1750 66.0 !O! hub: 67,0 m (TOT: 100,0 m) (215)	0:00	0:00
210	VESTAS V66 1750 66.0 !O! hub: 67,0 m (TOT: 100,0 m) (216)	0:00	0:00
211	VESTAS V80-2.0MW 2000 80.0 !O! hub: 68,0 m (TOT: 108,0 m) (217)	3:52	0:53
212	ENERCON E-82 E3 3000 82.0 !O! hub: 108,4 m (TOT: 149,4 m) (218)	0:00	0:00
213	ENERCON E-82 E3 3000 82.0 !O! hub: 108,4 m (TOT: 149,4 m) (219)	0:00	0:00
214	ENERCON E-82 E3 3000 82.0 !O! hub: 108,4 m (TOT: 149,4 m) (220)	0:00	0:00
215	ENERCON E-82 E3 3000 82.0 !O! hub: 108,4 m (TOT: 149,4 m) (221)	0:00	0:00
216	ENERCON E-82 E3 3000 82.0 !O! hub: 108,4 m (TOT: 149,4 m) (222)	0:00	0:00
217	ENERCON E-82 E3 3000 82.0 !O! hub: 108,4 m (TOT: 149,4 m) (223)	0:00	0:00
218	ENERCON E-82 E3 3000 82.0 !O! hub: 108,4 m (TOT: 149,4 m) (224)	0:00	0:00
219	ENERCON E-82 E3 3000 82.0 !O! hub: 108,4 m (TOT: 149,4 m) (225)	0:00	0:00
220	ENERCON E-82 E3 3000 82.0 !O! hub: 108,4 m (TOT: 149,4 m) (226)	0:00	0:00
221	ENERCON E-70 E4 2000 71.0 !O! hub: 70,0 m (TOT: 105,5 m) (227)	0:00	0:00
222	ENERCON E-70 E4 2000 71.0 !O! hub: 70,0 m (TOT: 105,5 m) (228)	0:00	0:00
223	NEG MICON NM52/900 900-200 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (229)	0:00	0:00
224	NEG MICON NM52/900 900-200 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (230)	0:00	0:00
225	NEG MICON NM52/900 900-200 52.0 !O! hub: 55,0 m (TOT: 81,0 m) (231)	0:00	0:00
226	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (232)	0:00	0:00
227	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (233)	0:00	0:00
228	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (234)	0:00	0:00
229	NEG MICON NM1000/54 1000-250 54.0 !O! hub: 55,0 m (TOT: 82,0 m) (235)	0:00	0:00

To be continued on next page...

Project:
715027 SS

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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	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

Project:
715027 SS

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Calculated:
29-11-2016 22:20/3.0.654

SHADOW - Main Result

Calculation: SS VKA - bedrijfswoningen

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

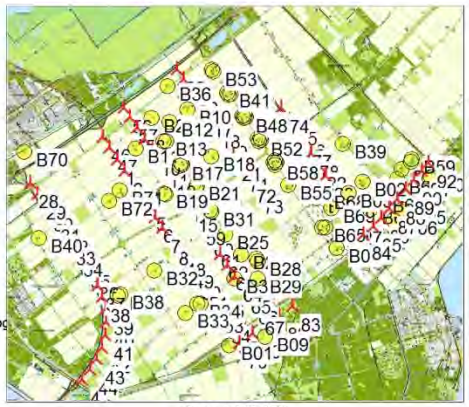
Operational time

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.wpg
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
Shadow receptor

WTGs

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
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

Licensed user:
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Calculated:
29-11-2016 22:20/3.0.654

SHADOW - Main Result

Calculation: SS VKA - bedrijfswoningen

...continued from previous page

					WTG type						Shadow data	
	X (east)	Y (north)	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
39	152.373	483.308	-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
40	152.409	482.846	-4,7	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
41	152.367	482.383	-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
42	152.247	481.935	-5,7	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
43	152.053	481.518	-4,0	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
44	151.791	481.135	-3,3	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
45	151.495	480.780	-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
46	152.276	489.508	-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
47	152.547	489.127	-6,9	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
48	155.165	485.402	-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
49	155.464	484.974	-6,1	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
50	155.747	484.584	-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
51	156.035	484.187	-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
52	156.325	483.792	-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
53	156.609	483.393	-6,5	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
54	156.897	482.997	-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
55	157.184	482.600	-5,3	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
56	153.109	490.563	-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
57	153.336	490.229	-6,6	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
58	153.602	489.860	-5,7	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
59	155.939	486.534	-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
60	156.231	486.119	-5,8	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
61	156.513	485.718	-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
62	156.805	485.302	-6,3	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
63	157.088	484.899	-6,8	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
64	157.370	484.498	-5,9	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
65	157.675	484.064	-6,3	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
66	157.938	483.689	-5,4	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
67	158.213	483.301	-5,8	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
68	155.137	491.948	-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
69	155.387	491.595	-4,8	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
70	155.660	491.206	-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
71	157.593	488.458	-5,7	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
72	157.869	488.066	-4,9	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
73	158.148	487.668	-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
74	159.143	490.558	-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
75	159.439	490.135	-6,3	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
76	159.751	489.692	-3,2	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
77	160.019	489.310	-5,1	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
78	160.295	488.917	-5,1	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
79	157.541	482.103	-6,7	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
80	158.059	482.440	-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
81	158.579	482.778	-5,4	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
82	159.082	483.106	-4,0	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
83	159.587	483.434	1,0	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
84	162.318	486.025	-6,0	SENVION MM100 2000 100.0 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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]	[°]	[°]	
B01	157.167	481.993	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B02	162.299	487.888	-2,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B03	161.762	487.503	-3,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B04	164.873	488.014	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"

To be continued on next page...

Project:
715027 SS

Licensed user:
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0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
29-11-2016 22:20/3.0.654

SHADOW - Main Result

Calculation: SS VKA - bedrijfswoningen

...continued from previous page

No.	X (east)	Y (north)	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction mode
B05	163.821	486.887	-3,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B06	163.491	486.527	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B07	164.903	488.065	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B08	161.294	485.510	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B09	158.540	482.306	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B10	155.545	490.506	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B11	153.545	489.093	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B12	154.854	490.050	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B13	154.638	489.355	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B14	154.741	489.346	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B15	155.291	488.559	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B16	155.334	488.504	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B17	155.265	488.467	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B18	156.467	488.793	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B19	154.652	487.474	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B20	154.704	487.451	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B21	155.903	487.743	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B22	154.177	490.191	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B23	156.418	486.878	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B23	155.879	487.641	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B25	157.001	485.976	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B26	157.608	485.259	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B27	158.199	485.126	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B28	158.266	485.020	-5,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B29	158.244	484.409	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B30	157.359	484.407	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B31	156.454	486.819	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B32	154.282	484.696	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B33	155.465	483.168	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B34	155.939	483.501	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B35	156.055	483.498	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B36	154.790	491.336	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B37	152.874	483.780	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B38	152.965	483.837	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B39	161.516	489.250	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B40	149.819	485.867	-5,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B41	157.069	491.099	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B42	157.198	491.047	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B43	157.138	491.012	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B44	157.735	490.279	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B45	157.655	490.264	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B46	156.499	491.940	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B47	157.792	490.199	-2,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B48	157.715	490.184	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B49	158.356	489.476	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B50	158.249	489.436	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B51	158.382	489.409	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B52	158.316	489.355	-2,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B53	156.548	491.862	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B54	158.909	488.656	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B55	159.421	487.766	-3,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B56	158.858	488.586	-2,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B57	158.963	488.579	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B58	158.915	488.504	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B59	164.186	488.712	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B60	162.968	487.317	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B61	162.571	486.896	-3,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B62	164.152	488.613	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B63	163.790	488.357	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B64	163.605	487.999	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B65	160.721	486.249	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B66	160.848	486.253	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B67	160.491	487.292	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B68	160.730	487.449	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"

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Project:
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Calculated:
29-11-2016 22:20/3.0.654

SHADOW - Main Result

Calculation: SS VKA - bedrijfswoningen

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No.	X (east)	Y (north)	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction mode
B69	161.081	486.952	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B70	149.281	488.977	-5,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B71	152.954	487.589	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B72	152.543	487.192	-8,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
B01	182:31	132	1:50	46:14
B02	10:51	64	0:21	2:09
B03	147:37	245	1:13	31:30
B04	32:35	80	0:39	7:17
B05	61:21	115	0:50	14:21
B06	70:19	128	0:52	16:19
B07	28:23	75	0:37	6:07
B08	10:40	51	0:20	2:50
B09	118:33	165	1:06	26:20
B10	33:44	108	0:42	7:01
B11	61:15	132	0:56	12:59
B12	10:23	91	0:18	2:13
B13	76:53	179	0:54	16:29
B14	49:17	138	0:46	10:52
B15	53:17	140	0:48	11:17
B16	46:24	129	0:46	10:14
B17	65:45	162	0:53	14:32
B18	17:37	66	0:30	3:56
B19	59:50	168	0:45	12:22
B20	59:20	145	0:53	12:10
B21	47:00	131	0:45	9:54
B22	56:51	143	0:48	12:31
B23	70:29	163	0:55	14:57
B23	69:59	184	0:50	14:30
B25	88:44	215	0:58	19:32
B26	65:00	157	0:51	13:57
B27	17:08	82	0:27	3:18
B28	14:29	73	0:25	3:03
B29	59:36	164	0:48	12:35
B30	125:20	151	1:17	17:58
B31	62:40	154	0:54	13:46
B32	6:34	41	0:17	1:34
B33	7:24	58	0:18	1:47
B34	41:58	134	0:45	8:36
B35	56:13	126	0:56	10:55
B36	84:16	163	0:52	20:53
B37	113:18	237	0:50	23:29
B38	73:24	217	0:43	14:56
B39	8:06	58	0:16	1:32
B40	40:26	142	0:34	10:11
B41	12:01	71	0:21	2:17
B42	6:48	53	0:16	1:23
B43	9:09	61	0:19	1:53
B44	8:11	60	0:17	1:42
B45	10:41	65	0:21	2:07
B46	15:59	82	0:24	2:55
B47	16:23	96	0:18	2:59
B48	15:17	87	0:19	2:53
B49	23:48	139	0:20	5:01
B50	21:19	139	0:19	4:43
B51	20:54	133	0:21	3:48
B52	23:53	128	0:24	4:09

To be continued on next page...

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29-11-2016 22:20/3.0.654

SHADOW - Main Result

Calculation: SS VKA - bedrijfswoningen

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No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
B53	13:41	73	0:23	2:38
B54	30:08	157	0:20	6:18
B55	5:46	57	0:13	1:21
B56	30:52	156	0:24	5:56
B57	20:37	147	0:21	3:51
B58	23:27	131	0:24	4:15
B59	75:34	137	0:47	11:52
B60	89:27	183	1:03	15:52
B61	112:53	181	1:28	22:48
B62	67:22	120	0:50	12:51
B63	59:31	139	0:43	10:53
B64	92:05	179	0:51	16:14
B65	2:55	22	0:12	0:44
B66	5:11	28	0:17	1:19
B67	18:05	92	0:27	4:14
B68	36:16	113	0:42	7:34
B69	44:56	99	0:49	10:00
B70	0:00	0	0:00	0:00
B71	56:49	138	0:44	13:34
B72	3:50	24	0:14	0:57

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1027)	15:59	3:11
2	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1028)	0:00	0:00
3	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1029)	40:15	10:28
4	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1030)	29:27	6:18
5	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1031)	29:24	5:40
6	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1032)	0:00	0:00
7	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1033)	0:00	0:00
8	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1034)	0:00	0:00
9	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1035)	24:42	5:39
10	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1036)	97:25	20:12
11	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1037)	36:03	8:14
12	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1038)	68:54	14:18
13	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1039)	29:30	6:59
14	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1040)	88:42	18:20
15	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1041)	43:33	8:39
16	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1042)	12:54	2:49
17	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1043)	36:24	7:18
18	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1044)	11:12	2:09
19	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1045)	11:38	2:15
20	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1046)	16:25	2:40
21	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1047)	22:19	5:00
22	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1048)	7:05	1:26
23	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1049)	1:49	0:23
24	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1050)	57:05	13:01
25	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1051)	122:01	26:31
26	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1052)	75:31	15:25
27	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1053)	40:16	7:49
28	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1054)	0:00	0:00
29	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1055)	0:00	0:00
30	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1056)	0:00	0:00
31	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1057)	0:00	0:00
32	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1058)	32:43	8:36
33	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1059)	6:18	1:20
34	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1060)	1:25	0:15
35	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1061)	0:00	0:00
36	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1062)	5:20	1:10
37	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1063)	47:35	10:41
38	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1064)	43:33	9:53

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29-11-2016 22:20/3.0.654

SHADOW - Main Result

Calculation: SS VKA - bedrijfswoningen

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No.	Name	Worst case [h/year]	Expected [h/year]
39	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1065)	42:26	7:00
40	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1066)	0:00	0:00
41	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1067)	0:00	0:00
42	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1068)	0:00	0:00
43	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1069)	0:00	0:00
44	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1070)	0:00	0:00
45	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1071)	0:00	0:00
46	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1072)	3:19	0:44
47	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1073)	9:10	2:05
48	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1074)	0:00	0:00
49	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1075)	5:09	1:17
50	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1076)	1:25	0:17
51	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1077)	2:19	0:29
52	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1078)	11:09	2:28
53	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1079)	57:28	11:21
54	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1080)	15:05	2:40
55	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1081)	5:18	0:55
56	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1082)	8:07	1:49
57	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1083)	16:20	3:49
58	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1084)	48:53	10:29
59	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1085)	85:21	17:36
60	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1086)	23:15	5:26
61	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1087)	56:45	12:13
62	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1088)	23:04	5:08
63	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1089)	53:50	10:59
64	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1090)	33:27	7:01
65	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1091)	142:33	22:17
66	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1092)	38:08	4:54
67	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1093)	5:56	0:45
68	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1094)	3:19	0:45
69	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1095)	76:19	19:28
70	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1096)	31:20	5:51
71	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1097)	30:30	5:03
72	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1098)	12:10	2:32
73	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1099)	27:11	4:13
74	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1100)	3:50	0:57
75	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1101)	9:32	2:29
76	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1102)	4:16	1:03
77	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1103)	11:36	3:00
78	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1104)	8:15	1:56
79	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1105)	164:51	41:27
80	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1106)	138:40	31:43
81	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1107)	0:00	0:00
82	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1108)	0:00	0:00
83	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1109)	0:00	0:00
84	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1110)	10:40	2:50
85	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1111)	24:29	4:12
86	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1112)	108:25	23:27
87	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1113)	120:38	23:56
88	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1114)	30:21	7:00
89	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1115)	75:32	12:29
90	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1116)	97:05	19:18
91	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1117)	120:12	20:32
92	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1118)	54:41	12:01

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Calculated:
29-11-2016 22:48/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - bedrijfswoningen

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

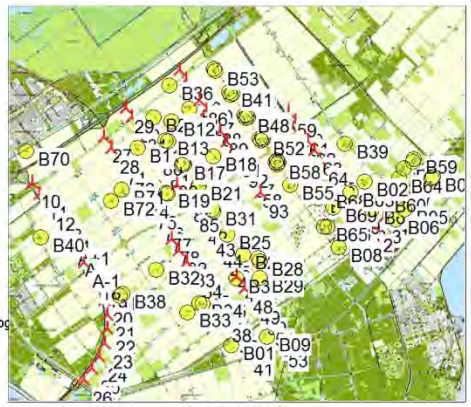
Operational time

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.wpg
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 Shadow receptor

WTGs

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	162.302	486.013	-6,0	VESTAS V110-2.0 2000 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
39	157.134	482.625	-6,0	Acciona Windpower AW...	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 AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5

To be continued on next page...

Project:
715027 SS

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0031742489940
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Calculated:
29-11-2016 22:48/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - bedrijfswoningen

...continued from previous page

					WTG type							Shadow data	
	X (east)	Y (north)	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
41	157.701	481.826	-5,2	Acciona Windpower AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
A	151.203	485.404	-6,0	ENERCON E-141 EP4 4...	Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
A+1	150.918	485.814	-6,0	ENERCON E-141 EP4 4...	Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
A-1	151.489	484.993	-5,2	ENERCON E-141 EP4 4...	Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6

Project:
715027 SS

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Calculated:
29-11-2016 22:48/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - bedrijfswoningen

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]	[°]	[°]	
B01	157.167	481.993	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B02	162.299	487.888	-2,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B03	161.762	487.503	-3,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B04	164.873	488.014	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B05	163.821	486.887	-3,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B06	163.491	486.527	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B07	164.903	488.065	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B08	161.294	485.510	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B09	158.540	482.306	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B10	155.545	490.506	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B11	153.545	489.093	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B12	154.854	490.050	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B13	154.638	489.355	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B14	154.741	489.346	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B15	155.291	488.559	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B16	155.334	488.504	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B17	155.265	488.467	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B18	156.467	488.793	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B19	154.652	487.474	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B20	154.704	487.451	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B21	155.903	487.743	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B22	154.177	490.191	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B23	156.418	486.878	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B23	155.879	487.641	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B25	157.001	485.976	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B26	157.608	485.259	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B27	158.199	485.126	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B28	158.266	485.020	-5,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B29	158.244	484.409	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B30	157.359	484.407	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B31	156.454	486.819	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B32	154.282	484.696	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B33	155.465	483.168	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B34	155.939	483.501	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B35	156.055	483.498	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B36	154.790	491.336	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B37	152.874	483.780	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B38	152.965	483.837	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B39	161.516	489.250	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B40	149.819	485.867	-5,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B41	157.069	491.099	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B42	157.198	491.047	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B43	157.138	491.012	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B44	157.735	490.279	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B45	157.655	490.264	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B46	156.499	491.940	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B47	157.792	490.199	-2,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B48	157.715	490.184	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B49	158.356	489.476	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B50	158.249	489.436	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B51	158.382	489.409	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B52	158.316	489.355	-2,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B53	156.548	491.862	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B54	158.909	488.656	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B55	159.421	487.766	-3,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B56	158.858	488.586	-2,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B57	158.963	488.579	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B58	158.915	488.504	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B59	164.186	488.712	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B60	162.968	487.317	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B61	162.571	486.896	-3,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B62	164.152	488.613	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B63	163.790	488.357	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B64	163.605	487.999	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"

To be continued on next page...

Project:
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Calculated:
29-11-2016 22:48/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - bedrijfswoningen

...continued from previous page

No.	X (east)	Y (north)	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction mode
B65	160.721	486.249	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B66	160.848	486.253	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B67	160.491	487.292	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B68	160.730	487.449	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B69	161.081	486.952	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B70	149.281	488.977	-5,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B71	152.954	487.589	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B72	152.543	487.192	-8,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
B01	88:35	129	0:57	19:38
B02	25:51	112	0:30	4:58
B03	375:31	312	1:45	75:29
B04	31:29	80	0:41	6:51
B05	60:39	129	0:50	14:07
B06	85:21	167	0:56	19:47
B07	78:51	142	0:58	17:19
B08	12:14	55	0:21	3:15
B09	72:48	122	1:05	14:04
B10	34:40	101	0:44	7:05
B11	77:56	165	1:07	16:47
B12	20:33	99	0:26	4:29
B13	101:04	208	0:54	21:56
B14	71:19	190	0:46	15:52
B15	51:44	138	0:47	10:56
B16	45:02	129	0:46	9:55
B17	63:30	159	0:52	14:02
B18	27:41	97	0:35	6:27
B19	56:12	159	0:52	11:42
B20	63:58	170	0:57	12:43
B21	46:26	131	0:45	9:46
B22	93:02	176	0:51	21:08
B23	70:19	162	0:56	14:53
B23	68:46	181	0:50	14:15
B25	89:16	212	0:59	19:39
B26	65:42	158	0:52	14:06
B27	17:17	82	0:27	3:20
B28	14:37	73	0:25	3:05
B29	60:17	165	0:49	12:44
B30	130:09	152	1:12	18:40
B31	62:25	153	0:55	13:42
B32	7:31	46	0:18	1:49
B33	8:35	47	0:20	2:03
B34	44:05	114	0:50	8:52
B35	70:53	141	1:02	14:16
B36	80:24	176	0:50	19:42
B37	164:32	258	0:54	33:11
B38	131:34	267	0:47	26:16
B39	25:48	110	0:24	4:34
B40	73:32	154	0:41	18:02
B41	11:50	70	0:21	2:17
B42	16:08	89	0:19	2:48
B43	18:13	91	0:21	3:16
B44	16:17	84	0:19	2:45
B45	19:19	84	0:22	3:22
B46	17:13	84	0:24	3:06
B47	11:57	87	0:18	2:07
B48	19:34	103	0:21	3:20

To be continued on next page...

Project:
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29-11-2016 22:48/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - bedrijfswoningen

...continued from previous page

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
B49	13:55	111	0:16	2:52
B50	19:58	130	0:21	3:37
B51	15:18	118	0:17	3:16
B52	16:04	120	0:20	3:12
B53	14:40	76	0:24	2:47
B54	20:19	140	0:20	4:20
B55	6:17	57	0:14	1:25
B56	19:33	135	0:23	3:56
B57	11:31	86	0:20	2:18
B58	14:12	86	0:23	2:53
B59	103:33	156	0:52	15:21
B60	137:02	231	1:10	22:18
B61	164:49	255	1:45	34:01
B62	88:35	143	0:55	15:13
B63	77:00	170	0:48	12:47
B64	131:45	215	0:57	21:27
B65	9:26	69	0:12	2:26
B66	5:29	46	0:16	1:23
B67	35:31	120	0:34	8:53
B68	92:45	210	0:55	22:12
B69	49:44	137	0:43	11:23
B70	0:00	0	0:00	0:00
B71	39:40	122	0:37	8:53
B72	5:50	41	0:16	1:25

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)	14:53	3:48
2	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1416)	25:49	4:40
3	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1417)	128:16	27:46
4	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1418)	152:16	27:20
5	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1419)	38:27	8:26
6	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1420)	107:58	16:22
7	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1421)	113:37	20:41
8	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1422)	214:28	36:57
9	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1423)	59:41	13:07
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)	0:00	0:00
13	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1427)	0:00	0:00
14	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1428)	53:08	13:49
18	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1432)	11:19	2:29
19	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1433)	78:41	17:31
20	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1434)	55:48	12:16
21	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1435)	70:46	10:53
22	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1436)	0:00	0:00
23	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1437)	0:00	0:00
24	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1438)	0:00	0:00
25	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1439)	0:00	0:00
26	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1440)	0:00	0:00
27	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1441)	10:42	2:23
28	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1442)	18:11	4:12
29	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1443)	20:54	4:42
30	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1444)	39:08	9:12
31	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1445)	89:53	19:44
32	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1446)	0:00	0:00
33	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1447)	5:50	1:29
34	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1448)	1:41	0:20
35	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1449)	2:04	0:26
36	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1450)	4:31	0:48
37	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1451)	73:52	14:57

To be continued on next page...

Project:
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29-11-2016 22:48/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - bedrijfswoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
38	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1452)	18:11	3:13
39	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1453)	5:35	0:55
40	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1454)	48:39	12:24
41	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1455)	57:27	10:53
42	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1456)	85:19	17:34
43	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1457)	23:22	5:28
44	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1458)	57:21	12:21
45	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1459)	23:15	5:10
46	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1460)	54:21	11:05
47	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1461)	33:44	7:04
48	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1462)	144:36	22:40
49	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1463)	38:30	5:01
50	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1464)	5:57	0:45
51	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1465)	0:00	0:00
52	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1466)	0:00	0:00
53	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1467)	53:38	10:08
54	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1468)	3:37	0:48
55	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1469)	73:52	18:36
56	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1470)	31:30	5:46
57	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1471)	11:50	2:24
58	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1472)	17:21	3:03
59	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1473)	0:34	0:08
60	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1474)	8:04	2:09
61	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1475)	2:28	0:36
62	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1476)	8:55	2:16
63	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1477)	8:08	1:54
64	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1478)	7:00	1:24
65	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1479)	15:48	2:32
66	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1480)	11:18	2:29
67	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1481)	221:51	52:09
68	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1482)	276:52	53:53
69	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1483)	82:56	17:10
70	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1484)	60:53	11:41
71	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1485)	14:48	2:57
72	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1486)	1:04	0:09
73	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1487)	18:57	4:52
74	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1488)	31:53	6:55
75	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1489)	28:19	5:34
76	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1490)	7:24	1:03
77	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1491)	0:00	0:00
78	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1492)	0:00	0:00
79	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1493)	24:19	5:33
80	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1494)	96:23	19:59
81	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1495)	35:00	7:59
82	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1496)	66:35	13:48
83	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1497)	29:15	6:55
84	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1498)	88:07	18:11
85	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1499)	42:46	8:31
86	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1500)	8:40	1:43
87	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1501)	38:40	8:04
88	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1502)	24:06	4:03
89	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1503)	11:28	2:17
90	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1504)	26:41	4:10
91	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1505)	27:30	6:33
92	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1506)	26:42	4:29
93	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1507)	3:05	0:38
A	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1430)	6:03	1:06
A+1	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1429)	14:21	3:09
A-1	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1431)	0:00	0:00

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Calculated:
29-11-2016 23:14/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - bedrijfswoningen

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.wpg
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
Shadow receptor

WTGs

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	162.318	486.025	-6,0	SENVION MM100 2000 100.0 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !O! h...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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 !...	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

Licensed user:
Pondera Consult B.V.
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NL-7556 PE Hengelo
0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
29-11-2016 23:14/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - bedrijfswoningen

...continued from previous page

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
39	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
40	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
41	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
42	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
43	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
44	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
45	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
46	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
47	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
48	152.373	483.308	-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
49	152.409	482.846	-4,7	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
50	152.367	482.383	-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
51	152.247	481.935	-5,7	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
52	152.053	481.518	-4,0	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
53	151.791	481.135	-3,3	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
54	151.495	480.780	-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
55	152.276	489.508	-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
56	152.547	489.127	-6,9	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
57	155.165	485.402	-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
58	155.464	484.974	-6,1	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
59	155.747	484.584	-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
60	156.035	484.187	-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
61	156.325	483.792	-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
62	156.609	483.393	-6,5	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
63	156.897	482.997	-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
64	157.184	482.600	-5,3	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
65	157.457	482.203	-5,9	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
66	157.727	481.826	-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
67	153.109	490.563	-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
68	153.336	490.229	-6,6	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
69	153.602	489.860	-5,7	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
70	155.939	486.534	-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
71	156.231	486.119	-5,8	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
72	156.513	485.718	-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
73	156.805	485.302	-6,3	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
74	157.088	484.899	-6,8	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
75	157.370	484.498	-5,9	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
76	157.675	484.064	-6,3	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
77	157.938	483.689	-5,4	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
78	158.213	483.301	-5,8	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
79	158.499	482.893	-2,1	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
80	158.769	482.512	-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
81	159.035	482.134	-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
82	155.137	491.948	-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
83	155.387	491.595	-4,8	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
84	155.660	491.206	-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
85	157.593	488.458	-5,7	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
86	157.869	488.066	-4,9	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
87	158.148	487.668	-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
88	159.143	490.558	-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
89	159.439	490.135	-6,3	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
90	159.751	489.692	-3,2	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
91	160.019	489.310	-5,1	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
92	160.295	488.917	-5,1	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

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]	[°]	[°]	
B01	157.167	481.993	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B02	162.299	487.888	-2,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B03	161.762	487.503	-3,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B04	164.873	488.014	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"

To be continued on next page...

Project:
715027 SS

Licensed user:
Pondera Consult B.V.
Welbergweg 49
NL-7556 PE Hengelo
0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
29-11-2016 23:14/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - bedrijfswoningen

...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]	[°]	[°]	
B05	163.821	486.887	-3,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B06	163.491	486.527	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B07	164.903	488.065	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B08	161.294	485.510	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B09	158.540	482.306	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B10	155.545	490.506	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B11	153.545	489.093	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B12	154.854	490.050	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B13	154.638	489.355	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B14	154.741	489.346	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B15	155.291	488.559	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B16	155.334	488.504	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B17	155.265	488.467	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B18	156.467	488.793	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B19	154.652	487.474	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B20	154.704	487.451	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B21	155.903	487.743	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B22	154.177	490.191	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B23	156.418	486.878	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B23	155.879	487.641	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B25	157.001	485.976	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B26	157.608	485.259	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B27	158.199	485.126	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B28	158.266	485.020	-5,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B29	158.244	484.409	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B30	157.359	484.407	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B31	156.454	486.819	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B32	154.282	484.696	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B33	155.465	483.168	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B34	155.939	483.501	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B35	156.055	483.498	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B36	154.790	491.336	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B37	152.874	483.780	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B38	152.965	483.837	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B39	161.516	489.250	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B40	149.819	485.867	-5,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B41	157.069	491.099	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B42	157.198	491.047	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B43	157.138	491.012	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B44	157.735	490.279	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B45	157.655	490.264	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B46	156.499	491.940	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B47	157.792	490.199	-2,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B48	157.715	490.184	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B49	158.356	489.476	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B50	158.249	489.436	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B51	158.382	489.409	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B52	158.316	489.355	-2,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B53	156.548	491.862	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B54	158.909	488.656	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B55	159.421	487.766	-3,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B56	158.858	488.586	-2,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B57	158.963	488.579	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B58	158.915	488.504	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B59	164.186	488.712	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B60	162.968	487.317	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B61	162.571	486.896	-3,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B62	164.152	488.613	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B63	163.790	488.357	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B64	163.605	487.999	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B65	160.721	486.249	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B66	160.848	486.253	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B67	160.491	487.292	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B68	160.730	487.449	-4,6	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:
29-11-2016 23:14/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - bedrijfswoningen

...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]	[°]	[°]	
B69	161.081	486.952	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B70	149.281	488.977	-5,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B71	152.954	487.589	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B72	152.543	487.192	-8,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

	Shadow, worst case			Shadow, expected values
No.	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]
B01	58:19	105	0:54	12:08
B02	10:51	64	0:21	2:09
B03	147:37	245	1:13	31:30
B04	32:35	80	0:39	7:17
B05	61:21	115	0:50	14:21
B06	70:19	128	0:52	16:19
B07	28:23	75	0:37	6:07
B08	10:40	51	0:20	2:50
B09	73:32	129	1:01	14:15
B10	33:44	108	0:42	7:01
B11	61:15	132	0:56	12:59
B12	10:23	91	0:18	2:13
B13	76:53	179	0:54	16:29
B14	49:17	138	0:46	10:52
B15	53:17	140	0:48	11:17
B16	46:24	129	0:46	10:14
B17	65:45	162	0:53	14:32
B18	17:37	66	0:30	3:56
B19	59:50	168	0:45	12:22
B20	59:20	145	0:53	12:10
B21	47:00	131	0:45	9:54
B22	56:51	143	0:48	12:31
B23	70:29	163	0:55	14:57
B23	69:59	184	0:50	14:30
B25	88:44	215	0:58	19:32
B26	65:00	157	0:51	13:57
B27	17:08	82	0:27	3:18
B28	14:29	73	0:25	3:03
B29	59:36	164	0:48	12:35
B30	125:20	151	1:17	17:58
B31	62:40	154	0:54	13:46
B32	6:34	41	0:17	1:34
B33	7:24	58	0:18	1:47
B34	41:58	134	0:45	8:36
B35	56:13	126	0:56	10:55
B36	84:16	163	0:52	20:53
B37	113:18	237	0:50	23:29
B38	73:24	217	0:43	14:56
B39	8:06	58	0:16	1:32
B40	40:26	142	0:34	10:11
B41	12:01	71	0:21	2:17
B42	6:48	53	0:16	1:23
B43	9:09	61	0:19	1:53
B44	8:11	60	0:17	1:42
B45	10:41	65	0:21	2:07
B46	15:59	82	0:24	2:55
B47	16:23	96	0:18	2:59
B48	15:17	87	0:19	2:53
B49	23:48	139	0:20	5:01
B50	21:19	139	0:19	4:43
B51	20:54	133	0:21	3:48
B52	23:53	128	0:24	4:09

To be continued on next page...

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29-11-2016 23:14/3.0.654

SHADOW - Main Result

Calculation: SS VKA terugvaloptie - bedrijfswoningen

...continued from previous page

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
B53	13:41	73	0:23	2:38
B54	30:08	157	0:20	6:18
B55	5:46	57	0:13	1:21
B56	30:52	156	0:24	5:56
B57	20:37	147	0:21	3:51
B58	23:27	131	0:24	4:15
B59	75:34	137	0:47	11:52
B60	89:27	183	1:03	15:52
B61	112:53	181	1:28	22:48
B62	67:22	120	0:50	12:51
B63	59:31	139	0:43	10:53
B64	92:05	179	0:51	16:14
B65	2:55	22	0:12	0:44
B66	5:11	28	0:17	1:19
B67	18:05	92	0:27	4:14
B68	36:16	113	0:42	7:34
B69	44:56	99	0:49	10:00
B70	0:00	0	0:00	0:00
B71	56:49	138	0:44	13:34
B72	3:50	24	0:14	0:57

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 !O! hub: 110,0 m (TOT: 160,0 m) (1211)	10:40	2:50
2	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1212)	24:29	4:12
3	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1213)	108:25	23:27
4	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1214)	120:38	23:56
5	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1215)	30:21	7:00
6	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1216)	75:32	12:29
7	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1217)	97:05	19:18
8	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1218)	120:12	20:32
9	SENVION MM100 2000 100.0 !O! hub: 110,0 m (TOT: 160,0 m) (1219)	54:41	12:01
10	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1220)	15:59	3:11
11	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1221)	0:00	0:00
12	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1222)	40:15	10:28
13	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1223)	29:27	6:18
14	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1224)	29:24	5:40
15	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1225)	0:00	0:00
16	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1226)	0:00	0:00
17	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1227)	0:00	0:00
18	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1228)	24:42	5:39
19	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1229)	97:25	20:12
20	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1230)	36:03	8:14
21	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1231)	68:54	14:18
22	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1232)	29:30	6:59
23	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1233)	88:42	18:20
24	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1234)	43:33	8:39
25	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1235)	12:54	2:49
26	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1236)	36:24	7:18
27	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1237)	11:12	2:09
28	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1238)	11:38	2:15
29	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1239)	16:25	2:40
30	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1240)	22:19	5:00
31	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1241)	7:05	1:26
32	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1242)	1:49	0:23
33	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1243)	57:05	13:01
34	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1244)	122:01	26:31
35	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1245)	75:31	15:25
36	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1246)	40:16	7:49
37	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1247)	0:00	0:00
38	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1248)	0:00	0:00

To be continued on next page...

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SHADOW - Main Result

Calculation: SS VKA terugvaloptie - bedrijfswoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
39	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1249)	0:00	0:00
40	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1250)	0:00	0:00
41	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1251)	32:43	8:36
42	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1252)	6:18	1:20
43	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1253)	1:25	0:15
44	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1254)	0:00	0:00
45	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1255)	5:20	1:10
46	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1256)	47:35	10:41
47	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1257)	43:33	9:53
48	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1258)	42:26	7:00
49	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1259)	0:00	0:00
50	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1260)	0:00	0:00
51	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1261)	0:00	0:00
52	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1262)	0:00	0:00
53	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1263)	0:00	0:00
54	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1264)	0:00	0:00
55	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1265)	3:19	0:44
56	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1266)	9:10	2:05
57	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1267)	0:00	0:00
58	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1268)	5:09	1:17
59	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1269)	1:25	0:17
60	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1270)	2:19	0:29
61	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1271)	11:09	2:28
62	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1272)	57:28	11:21
63	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1273)	15:05	2:40
64	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1274)	5:18	0:56
65	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1275)	23:57	5:51
66	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1276)	53:03	10:07
67	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1277)	8:07	1:49
68	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1278)	16:20	3:49
69	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1279)	48:53	10:29
70	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1280)	85:21	17:36
71	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1281)	23:15	5:26
72	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1282)	56:45	12:13
73	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1283)	23:04	5:08
74	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1284)	53:50	10:59
75	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1285)	33:27	7:01
76	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1286)	142:33	22:17
77	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1287)	38:08	4:54
78	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1288)	5:56	0:45
79	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1289)	0:00	0:00
80	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1290)	0:00	0:00
81	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1291)	52:37	9:56
82	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1292)	3:19	0:45
83	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1293)	76:19	19:28
84	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1294)	31:20	5:51
85	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1295)	30:30	5:03
86	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1296)	12:10	2:32
87	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1297)	27:11	4:13
88	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1298)	3:50	0:57
89	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1299)	9:32	2:29
90	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1300)	4:16	1:03
91	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1301)	11:36	3:00
92	Siemens SWT-3.3-130 3300 130.0 !O! hub: 95,0 m (TOT: 160,0 m) (1302)	8:15	1:56

Project:
715027 SS

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Calculated:
2-1-2017 12:47/3.0.654

SHADOW - Main Result

Calculation: Copy of SS VKA hoog - ALLE 163 WONINGEN INITIATIEFNEMERS DEC 2016

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

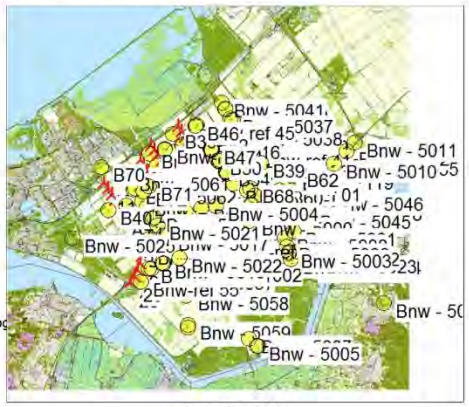
Operational time

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.wpc
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in
Dutch Stereo-RD/NAP 2000



Scale 1:400.000
New WTG
Shadow receptor

WTGs

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	162.302	486.013	-6,0	VESTAS V110-2.0 2000 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 4...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
39	157.134	482.625	-6,0	Acciona Windpower AW...	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 AW...	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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715027 SS

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2-1-2017 12:47/3.0.654

SHADOW - Main Result

Calculation: Copy of SS VKA hoog - ALLE 163 WONINGEN INITIATIEFNEMERS DEC 2016

...continued from previous page

					WTG type							Shadow data	
	X (east)	Y (north)	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
41	157.701	481.826	-5,2	Acciona Windpower AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 AW...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
A	151.203	485.404	-6,0	ENERCON E-141 EP4 4...	Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
A+1	150.918	485.814	-6,0	ENERCON E-141 EP4 4...	Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6
A-1	151.489	484.993	-5,2	ENERCON E-141 EP4 4...	Yes	ENERCON	E-141 EP4-4.200	4.200	141,0	149,5	1.692	10,6

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Calculated:
2-1-2017 12:47/3.0.654

SHADOW - Main Result

Calculation: Copy of SS VKA hoog - ALLE 163 WONINGEN INITIATIEFNEMERS DEC 2016

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]	[°]	[°]	
B01	157.167	481.993	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B02	162.299	487.888	-2,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B03	161.762	487.503	-3,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B04	164.873	488.014	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B05	163.821	486.887	-3,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B06	163.491	486.527	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B07	164.903	488.065	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B08	161.294	485.510	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B09	158.540	482.306	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B10	155.545	490.506	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B11	153.545	489.093	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B12	154.854	490.050	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B13	154.638	489.355	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B14	154.741	489.346	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B15	155.291	488.559	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B16	155.334	488.504	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B17	155.265	488.467	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B18	156.467	488.793	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B19	154.652	487.474	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B20	154.704	487.451	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B21	155.903	487.743	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B22	154.177	490.191	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B23	156.418	486.878	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B23	155.879	487.641	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B25	157.001	485.976	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B26	157.608	485.259	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B27	158.199	485.126	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B28	158.266	485.020	-5,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B29	158.244	484.409	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B30	157.359	484.407	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B31	156.454	486.819	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B32	154.282	484.696	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B33	155.465	483.168	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B34	155.939	483.501	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B35	156.055	483.498	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B36	154.790	491.336	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B37	152.874	483.780	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B38	152.965	483.837	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B39	161.516	489.250	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B40	149.819	485.867	-5,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B41	157.069	491.099	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B42	157.198	491.047	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B43	157.138	491.012	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B44	157.735	490.279	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B45	157.655	490.264	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B46	156.499	491.940	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B47	157.792	490.199	-2,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B48	157.715	490.184	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B49	158.356	489.476	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B50	158.249	489.436	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B51	158.382	489.409	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B52	158.316	489.355	-2,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B53	156.548	491.862	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B54	158.909	488.656	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B55	159.421	487.766	-3,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B56	158.858	488.586	-2,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B57	158.963	488.579	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B58	158.915	488.504	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B59	164.186	488.712	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B60	162.968	487.317	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B61	162.571	486.896	-3,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B62	164.152	488.613	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B63	163.790	488.357	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B64	163.605	487.999	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"

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Project:
715027 SS

Licensed user:
Pondera Consult B.V.
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NL-7556 PE Hengelo
0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
2-1-2017 12:47/3.0.654

SHADOW - Main Result

Calculation: Copy of SS VKA hoog - ALLE 163 WONINGEN INITIATIEFNEMERS DEC 2016

...continued from previous page

No.	X (east)	Y (north)	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction mode
B65	160.721	486.249	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B66	160.848	486.253	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B67	160.491	487.292	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B68	160.730	487.449	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B69	161.081	486.952	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B70	149.281	488.977	-5,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B71	152.954	487.589	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
B72	152.543	487.192	-8,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 1002	156.797	481.766	-6,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 1061	160.354	484.847	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 1105	151.215	486.222	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 1113	157.623	487.121	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 1115	155.968	487.707	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 1118	162.955	488.067	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 1119	163.844	488.421	-3,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5000	160.670	485.131	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5001	164.048	484.374	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5002	164.316	482.924	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5003	163.681	482.794	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5004	158.055	486.181	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5005	161.266	476.105	0,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5006	161.373	476.105	0,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5007	160.622	476.622	0,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5008	163.375	483.865	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5009	163.538	483.275	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5010	167.122	489.218	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5011	168.710	490.744	0,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5012	168.081	490.145	0,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5013	163.862	482.377	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5014	153.355	485.350	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5015	153.244	485.273	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5016	154.087	484.050	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5017	154.262	484.004	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5018	153.966	482.092	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5019	153.986	482.020	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5020	154.067	482.070	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5021	153.583	484.797	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5022	155.255	482.425	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5023	165.608	482.428	-0,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5024	165.975	482.308	4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5025	147.066	483.902	0,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5026	163.694	482.886	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5027	153.144	481.682	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5028	162.785	489.815	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5029	162.655	489.497	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5030	163.021	489.902	-3,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5031	161.673	489.267	-2,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5032	162.364	488.621	-2,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5033	162.263	488.550	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5034	161.250	489.730	-1,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5035	161.322	489.649	-1,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5036	159.351	492.342	-3,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5037	159.169	492.431	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5038	159.920	491.548	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5039	160.350	490.960	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5040	160.289	490.864	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5041	158.508	493.582	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5042	158.792	493.169	-3,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5043	158.831	493.101	-2,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5044	165.209	485.682	-1,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5045	165.145	485.616	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5046	166.120	486.889	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5047	164.698	485.346	-3,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5048	166.018	486.191	-4,3	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:
2-1-2017 12:47/3.0.654

SHADOW - Main Result

Calculation: Copy of SS VKA hoog - ALLE 163 WONINGEN INITIATIEFNEMERS DEC 2016

...continued from previous page

No.	X (east)	Y (north)	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction mode
Bnw - 5049	170.985	479.220	0,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5050	159.517	487.752	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5051	159.480	487.688	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5052	159.978	486.957	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5053	165.018	482.016	-2,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5054	160.359	487.185	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5055	168.806	489.425	0,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5056	155.392	481.784	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5057	154.661	481.226	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5058	155.780	479.730	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5059	155.953	477.631	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5060	155.930	477.440	0,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5061	151.252	488.292	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5062	151.775	487.344	-5,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5063	152.400	486.520	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5064	152.709	486.042	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw - 5065	151.842	487.442	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 01	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 06	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 07	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 09	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 14	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 16	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 22	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 23	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 28	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 29	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 33	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 36	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 37	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 39	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 41	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 45	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 52	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
Bnw-ref 55	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
B01	88:35	129	0:57	19:38
B02	25:51	112	0:30	4:58
B03	375:31	312	1:45	75:29
B04	31:29	80	0:41	6:51
B05	60:39	129	0:50	14:07
B06	85:21	167	0:56	19:47
B07	78:51	142	0:58	17:19
B08	12:14	55	0:21	3:15
B09	72:48	122	1:05	14:04
B10	34:40	101	0:44	7:05
B11	77:56	165	1:07	16:47
B12	20:33	99	0:26	4:29
B13	101:04	208	0:54	21:56
B14	71:19	190	0:46	15:52
B15	51:44	138	0:47	10:56
B16	45:02	129	0:46	9:55
B17	63:30	159	0:52	14:02
B18	27:41	97	0:35	6:27
B19	56:12	159	0:52	11:42
B20	63:58	170	0:57	12:43
B21	46:26	131	0:45	9:46

To be continued on next page...

Project:
715027 SS

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0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
2-1-2017 12:47/3.0.654

SHADOW - Main Result

Calculation: Copy of SS VKA hoog - ALLE 163 WONINGEN INITIATIEFNEMERS DEC 2016

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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]
B22	93:02	176	0:51	21:08
B23	70:19	162	0:56	14:53
B23	68:46	181	0:50	14:15
B25	89:16	212	0:59	19:39
B26	65:42	158	0:52	14:06
B27	17:17	82	0:27	3:20
B28	14:37	73	0:25	3:05
B29	60:17	165	0:49	12:44
B30	130:09	152	1:12	18:40
B31	62:25	153	0:55	13:42
B32	7:31	46	0:18	1:49
B33	8:35	47	0:20	2:03
B34	44:05	114	0:50	8:52
B35	70:53	141	1:02	14:16
B36	80:24	176	0:50	19:42
B37	164:32	258	0:54	33:11
B38	131:34	267	0:47	26:16
B39	25:48	110	0:24	4:34
B40	73:32	154	0:41	18:02
B41	11:50	70	0:21	2:17
B42	16:08	89	0:19	2:48
B43	18:13	91	0:21	3:16
B44	16:17	84	0:19	2:45
B45	19:19	84	0:22	3:22
B46	17:13	84	0:24	3:06
B47	11:57	87	0:18	2:07
B48	19:34	103	0:21	3:20
B49	13:55	111	0:16	2:52
B50	19:58	130	0:21	3:37
B51	15:18	118	0:17	3:16
B52	16:04	120	0:20	3:12
B53	14:40	76	0:24	2:47
B54	20:19	140	0:20	4:20
B55	6:17	57	0:14	1:25
B56	19:33	135	0:23	3:56
B57	11:31	86	0:20	2:18
B58	14:12	86	0:23	2:53
B59	103:33	156	0:52	15:21
B60	137:02	231	1:10	22:18
B61	164:49	255	1:45	34:01
B62	88:35	143	0:55	15:13
B63	77:00	170	0:48	12:47
B64	131:45	215	0:57	21:27
B65	9:26	69	0:12	2:26
B66	5:29	46	0:16	1:23
B67	35:31	120	0:34	8:53
B68	92:45	210	0:55	22:12
B69	49:44	137	0:43	11:23
B70	0:00	0	0:00	0:00
B71	39:40	122	0:37	8:53
B72	5:50	41	0:16	1:25
Bnw - 1002	32:08	100	0:32	8:07
Bnw - 1061	0:00	0	0:00	0:00
Bnw - 1105	214:20	306	1:08	45:10
Bnw - 1113	25:56	69	0:32	6:48
Bnw - 1115	45:59	144	0:41	9:23
Bnw - 1118	29:01	100	0:28	4:08
Bnw - 1119	97:11	181	0:48	15:03
Bnw - 5000	0:00	0	0:00	0:00
Bnw - 5001	0:00	0	0:00	0:00
Bnw - 5002	0:00	0	0:00	0:00
Bnw - 5003	0:00	0	0:00	0:00
Bnw - 5004	1:05	14	0:07	0:11

To be continued on next page...

Project:
715027 SS

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Calculated:
2-1-2017 12:47/3.0.654

SHADOW - Main Result

Calculation: Copy of SS VKA hoog - ALLE 163 WONINGEN INITIATIEFNEMERS DEC 2016

...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]
Bnw - 5005	0:00	0	0:00	0:00
Bnw - 5006	0:00	0	0:00	0:00
Bnw - 5007	0:00	0	0:00	0:00
Bnw - 5008	0:00	0	0:00	0:00
Bnw - 5009	0:00	0	0:00	0:00
Bnw - 5010	0:00	0	0:00	0:00
Bnw - 5011	0:00	0	0:00	0:00
Bnw - 5012	0:00	0	0:00	0:00
Bnw - 5013	0:00	0	0:00	0:00
Bnw - 5014	0:00	0	0:00	0:00
Bnw - 5015	11:35	61	0:19	2:00
Bnw - 5016	0:00	0	0:00	0:00
Bnw - 5017	1:01	16	0:05	0:16
Bnw - 5018	4:37	27	0:16	1:02
Bnw - 5019	0:00	0	0:00	0:00
Bnw - 5020	0:00	0	0:00	0:00
Bnw - 5021	3:48	21	0:17	0:47
Bnw - 5022	0:00	0	0:00	0:00
Bnw - 5023	0:00	0	0:00	0:00
Bnw - 5024	0:00	0	0:00	0:00
Bnw - 5025	0:00	0	0:00	0:00
Bnw - 5026	0:00	0	0:00	0:00
Bnw - 5027	67:28	152	0:38	15:02
Bnw - 5028	0:00	0	0:00	0:00
Bnw - 5029	0:00	0	0:00	0:00
Bnw - 5030	0:00	0	0:00	0:00
Bnw - 5031	14:42	98	0:18	2:33
Bnw - 5032	4:17	47	0:10	0:45
Bnw - 5033	8:06	63	0:15	1:26
Bnw - 5034	11:46	69	0:21	2:14
Bnw - 5035	19:50	97	0:21	3:27
Bnw - 5036	0:00	0	0:00	0:00
Bnw - 5037	0:00	0	0:00	0:00
Bnw - 5038	0:00	0	0:00	0:00
Bnw - 5039	21:00	83	0:23	3:27
Bnw - 5040	28:48	97	0:28	4:47
Bnw - 5041	0:00	0	0:00	0:00
Bnw - 5042	0:00	0	0:00	0:00
Bnw - 5043	0:00	0	0:00	0:00
Bnw - 5044	0:00	0	0:00	0:00
Bnw - 5045	0:00	0	0:00	0:00
Bnw - 5046	0:00	0	0:00	0:00
Bnw - 5047	0:00	0	0:00	0:00
Bnw - 5048	0:00	0	0:00	0:00
Bnw - 5049	0:00	0	0:00	0:00
Bnw - 5050	6:43	68	0:11	1:37
Bnw - 5051	6:01	58	0:12	1:25
Bnw - 5052	2:36	27	0:08	0:42
Bnw - 5053	0:00	0	0:00	0:00
Bnw - 5054	22:57	103	0:26	5:53
Bnw - 5055	0:00	0	0:00	0:00
Bnw - 5056	0:00	0	0:00	0:00
Bnw - 5057	0:00	0	0:00	0:00
Bnw - 5058	0:00	0	0:00	0:00
Bnw - 5059	0:00	0	0:00	0:00
Bnw - 5060	0:00	0	0:00	0:00
Bnw - 5061	7:45	45	0:15	2:01
Bnw - 5062	12:29	61	0:21	2:08
Bnw - 5063	10:26	57	0:19	1:47
Bnw - 5064	10:02	52	0:20	1:45
Bnw - 5065	0:00	0	0:00	0:00
Bnw-ref 01	424:23	296	2:04	84:51
Bnw-ref 06	0:00	0	0:00	0:00

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Project:
715027 SS

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2-1-2017 12:47/3.0.654

SHADOW - Main Result

Calculation: Copy of SS VKA hoog - ALLE 163 WONINGEN INITIATIEFNEMERS DEC 2016

...continued from previous page

No.	Shadow, worst case Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values Shadow hours per year [h/year]
Bnw-ref 07	74:54	183	0:54	16:27
Bnw-ref 09	238:11	270	1:32	51:09
Bnw-ref 14	98:17	182	0:51	21:47
Bnw-ref 16	87:43	161	1:01	21:06
Bnw-ref 22	80:16	191	0:58	17:38
Bnw-ref 23	97:47	203	1:01	21:14
Bnw-ref 28	139:14	138	1:28	19:16
Bnw-ref 29	98:35	227	0:56	20:05
Bnw-ref 33	114:48	186	1:02	22:53
Bnw-ref 36	61:43	136	0:39	13:38
Bnw-ref 37	206:37	222	1:31	41:41
Bnw-ref 39	25:13	123	0:24	4:25
Bnw-ref 41	18:03	92	0:26	3:32
Bnw-ref 45	12:03	71	0:20	2:12
Bnw-ref 52	84:20	154	1:05	18:39
Bnw-ref 55	29:19	56	0:41	7:00

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)	14:53	3:48
2	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1416)	25:49	4:40
3	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1417)	128:16	27:46
4	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1418)	152:16	27:20
5	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1419)	57:54	10:48
6	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1420)	114:38	17:33
7	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1421)	167:15	27:29
8	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1422)	230:33	40:03
9	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1423)	65:03	14:27
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)	0:01	0:00
13	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1427)	49:43	11:03
14	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1428)	123:41	30:14
18	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1432)	15:44	3:24
19	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1433)	89:39	19:23
20	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1434)	55:48	12:16
21	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1435)	171:12	32:47
22	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1436)	97:58	17:56
23	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1437)	67:09	13:59
24	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1438)	27:28	6:07
25	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1439)	14:13	2:59
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)	40:36	8:35
28	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1442)	58:05	10:59
29	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1443)	29:26	6:36
30	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1444)	55:08	12:54
31	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1445)	164:34	35:51
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)	5:50	1:29
34	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1448)	2:42	0:37
35	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1449)	2:21	0:29
36	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1450)	4:31	0:50
37	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1451)	74:31	15:02
38	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1452)	18:11	3:13
39	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1453)	73:07	16:47
40	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1454)	61:45	14:43
41	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1455)	75:02	14:45
42	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1456)	89:17	18:28
43	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1457)	46:12	11:11
44	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1458)	110:42	23:11
45	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1459)	29:32	6:25

To be continued on next page...

Project:
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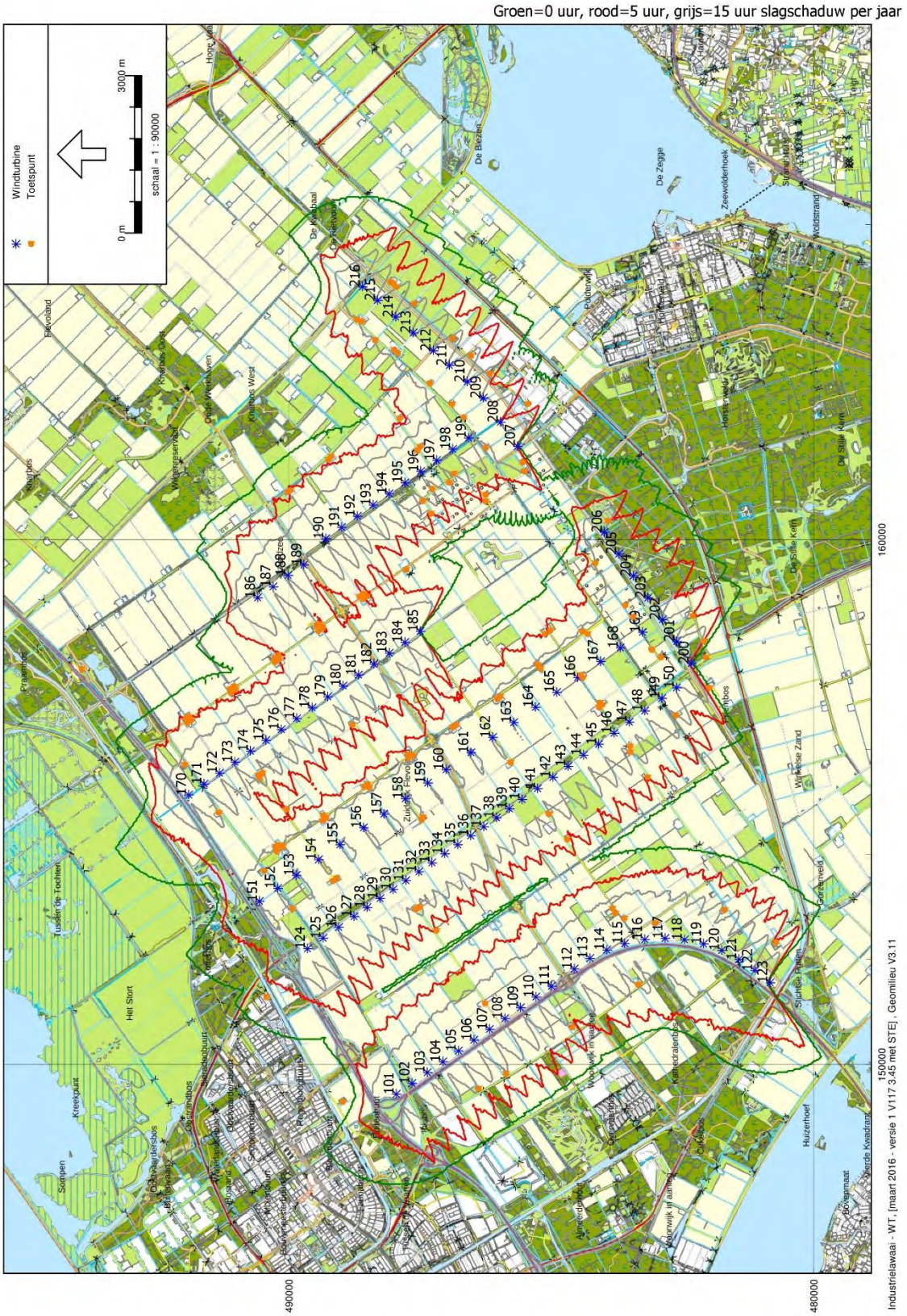
SHADOW - Main Result

Calculation: Copy of SS VKA hoog - ALLE 163 WONINGEN INITIATIEFNEMERS DEC 2016

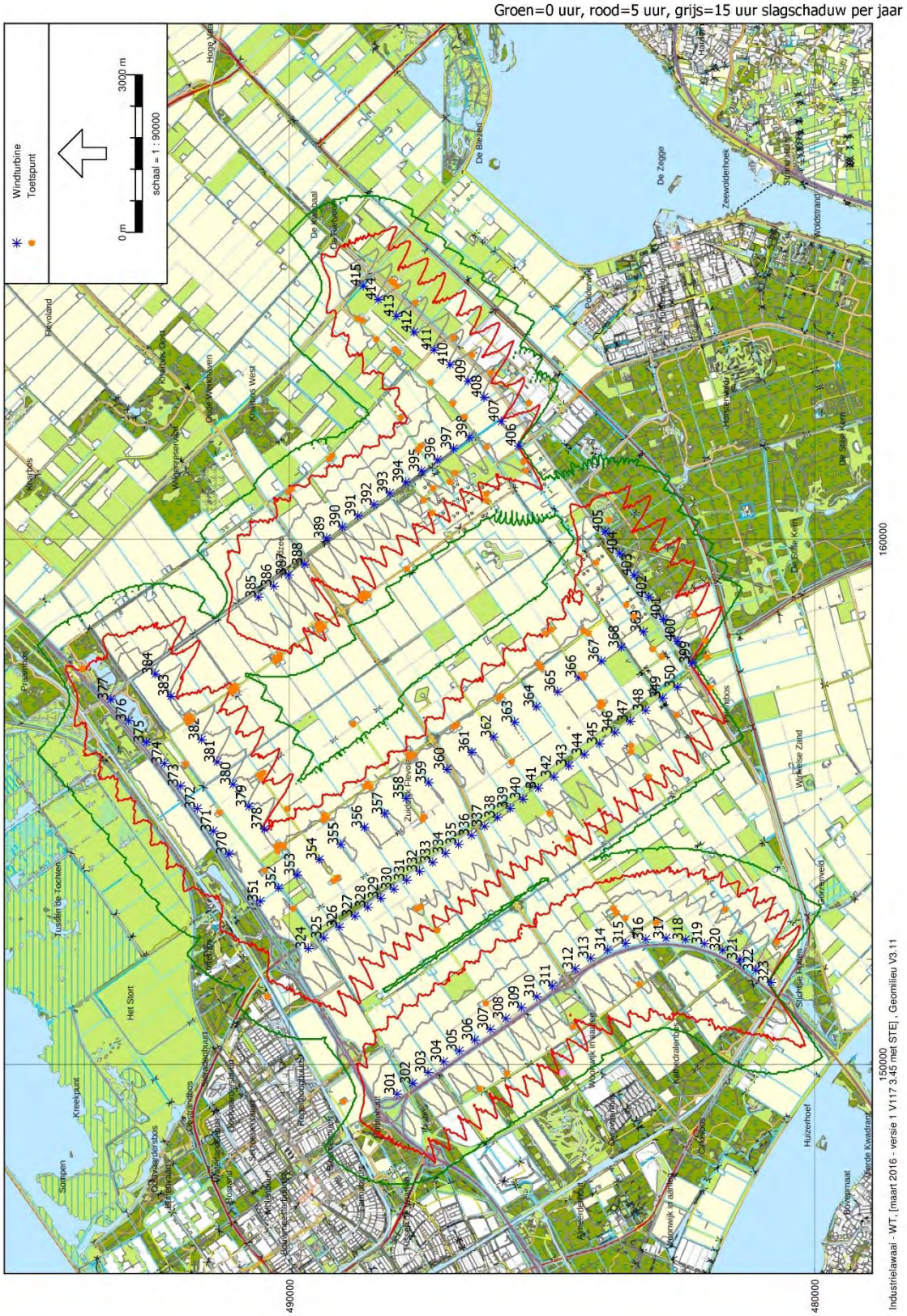
...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
46	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1460)	63:49	13:14
47	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1461)	50:06	10:50
48	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1462)	239:47	38:36
49	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1463)	162:17	30:24
50	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1464)	144:39	31:40
51	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1465)	32:56	4:36
52	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1466)	0:00	0:00
53	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1467)	53:38	10:08
54	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1468)	3:50	0:51
55	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1469)	73:52	18:36
56	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1470)	31:32	5:46
57	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1471)	11:50	2:24
58	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1472)	18:15	3:16
59	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1473)	11:26	2:23
60	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1474)	30:50	5:43
61	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1475)	10:25	2:18
62	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1476)	25:00	5:25
63	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1477)	21:59	4:26
64	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1478)	21:23	3:44
65	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1479)	29:47	5:05
66	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1480)	16:35	3:40
67	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1481)	298:57	70:11
68	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1482)	448:10	83:08
69	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1483)	91:58	18:31
70	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1484)	60:53	11:41
71	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1485)	14:48	2:57
72	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1486)	1:04	0:09
73	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1487)	18:57	4:52
74	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1488)	31:53	6:55
75	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1489)	28:19	5:34
76	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1490)	7:24	1:03
77	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1491)	2:45	0:37
78	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1492)	10:58	2:32
79	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1493)	30:28	6:47
80	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1494)	96:23	19:59
81	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1495)	35:00	7:59
82	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1496)	66:35	13:48
83	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1497)	29:20	6:57
84	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1498)	88:07	18:11
85	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1499)	50:06	9:35
86	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1500)	70:04	17:51
87	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1501)	51:25	10:33
88	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1502)	26:52	4:33
89	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1503)	11:28	2:17
90	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1504)	26:41	4:10
91	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1505)	27:30	6:33
92	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1506)	26:42	4:29
93	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1507)	31:18	7:56
A	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1430)	26:53	4:19
A+1	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1429)	114:19	21:37
A-1	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1431)	6:12	0:58

BIJLAGE 59 ALT 1A - SLAGSCHADUWCONTOUREN

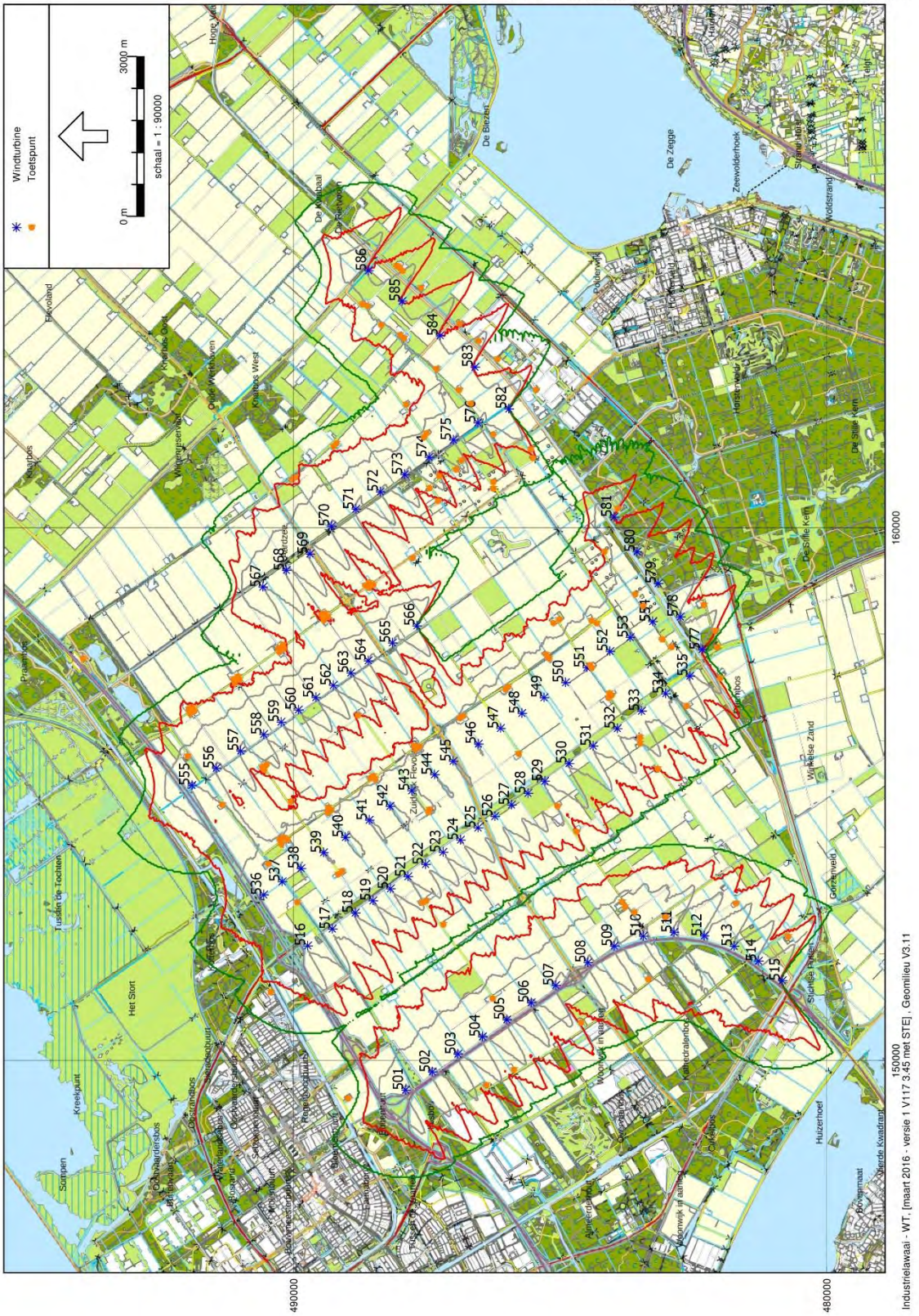


BIJLAGE 60 ALT 1B - SLAGSCHADUWCONTOUREN



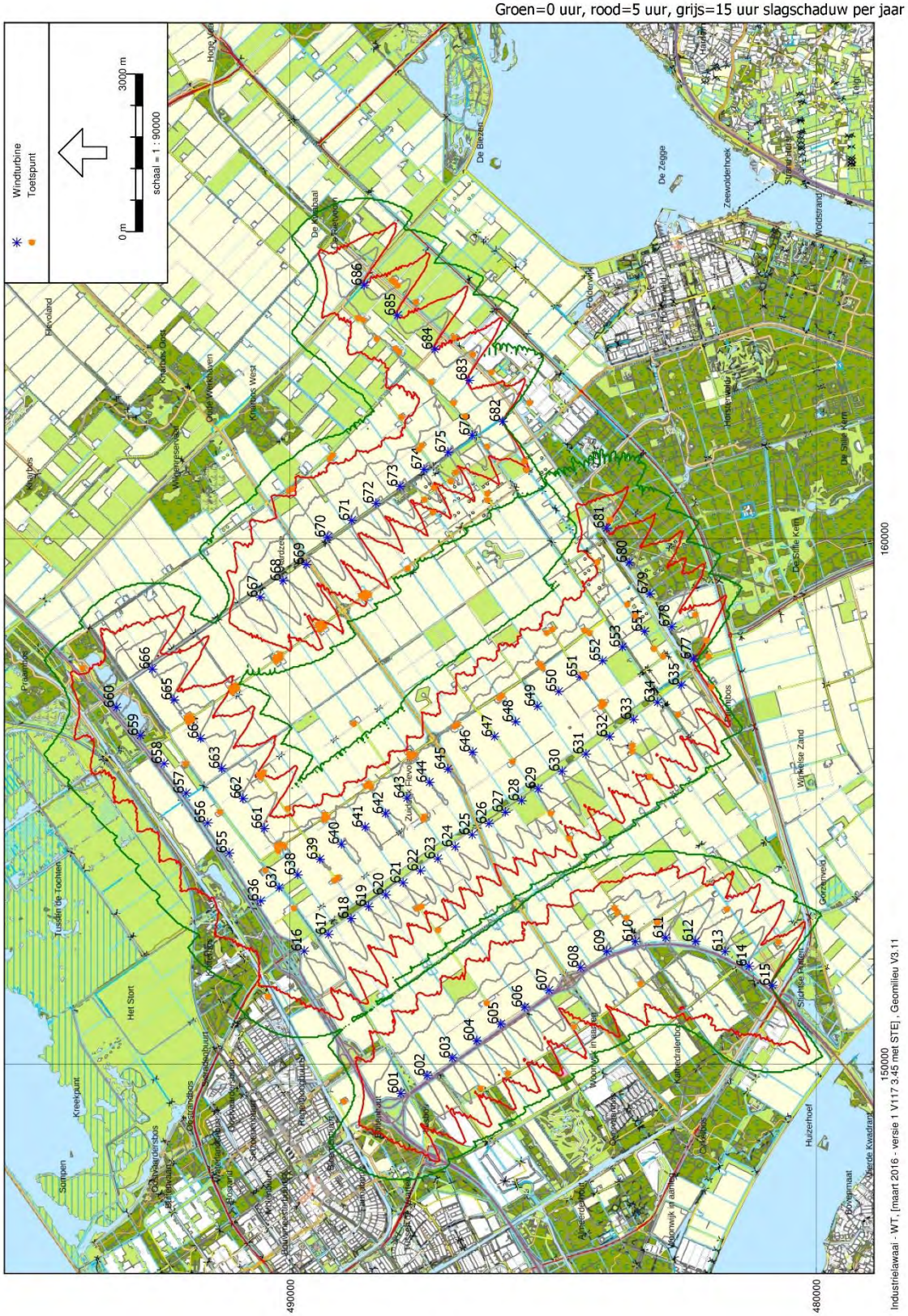
BIJLAGE 61 ALT 2A - SLAGSCHADUWCONTOUREN

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

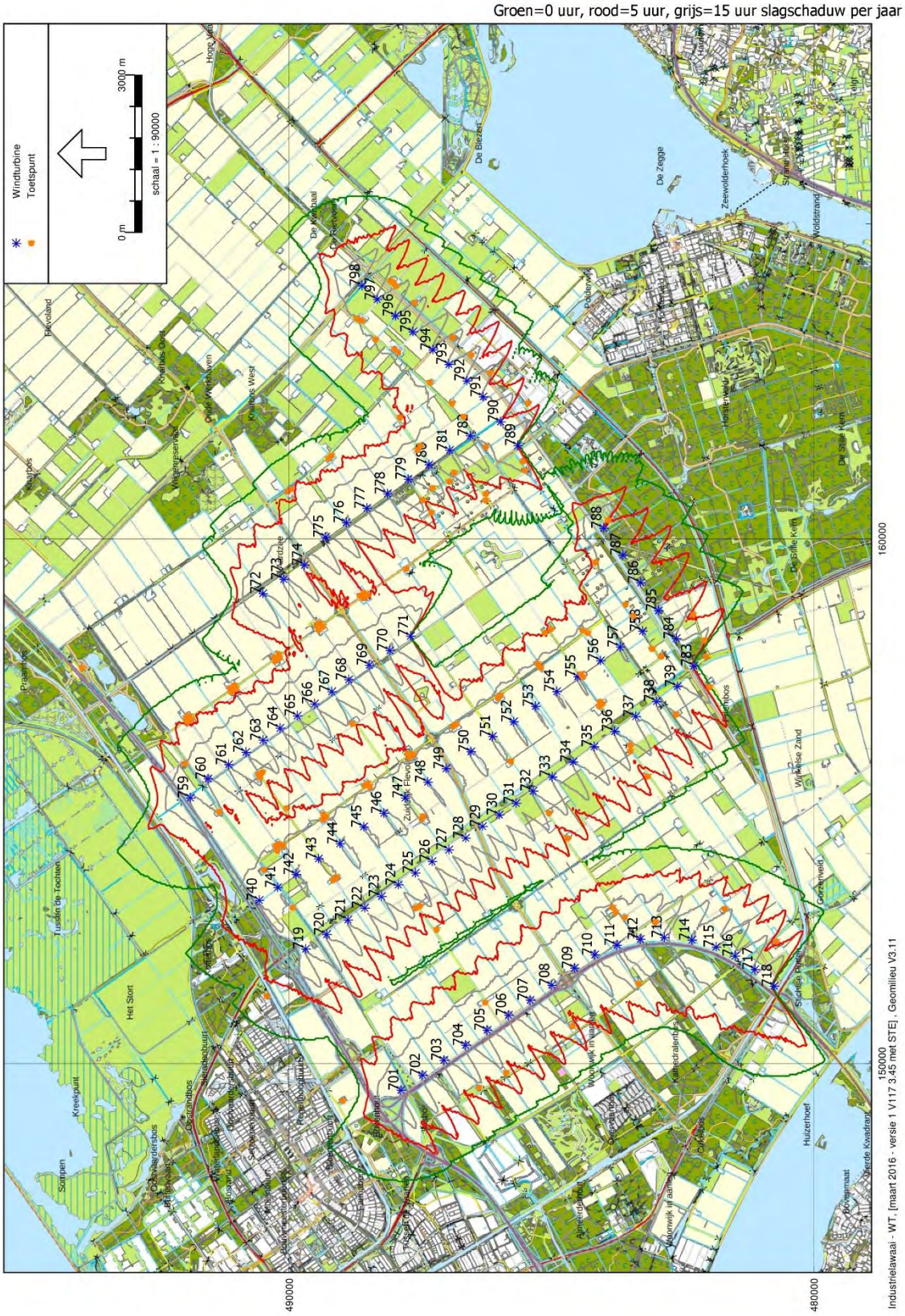


BIJLAGE 62 ALT 2B - SLAGSCHADUWCONTOUREN

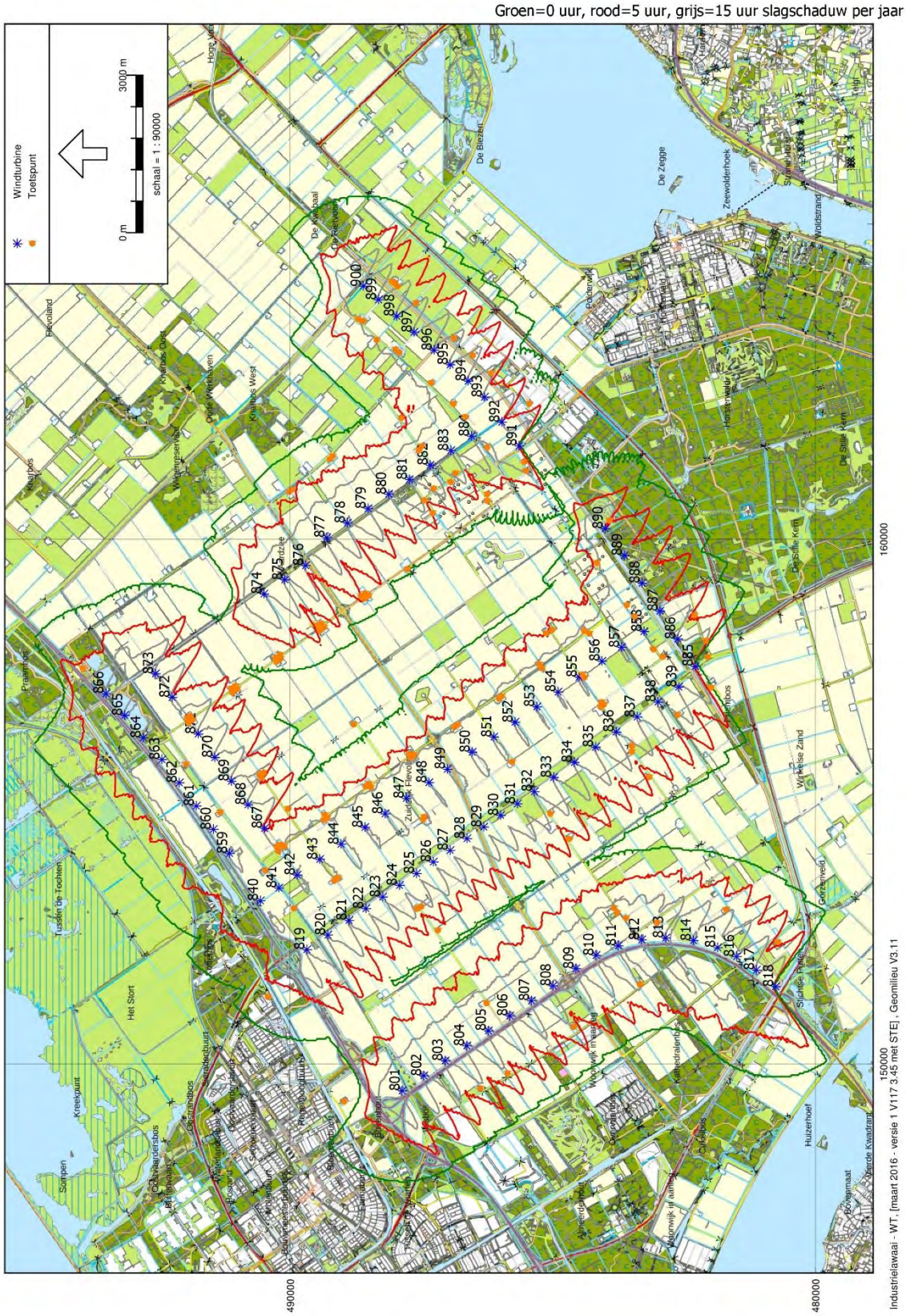
Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



BIJLAGE 63 ALT 3A - SLAGSCHADUWCONTOUREN

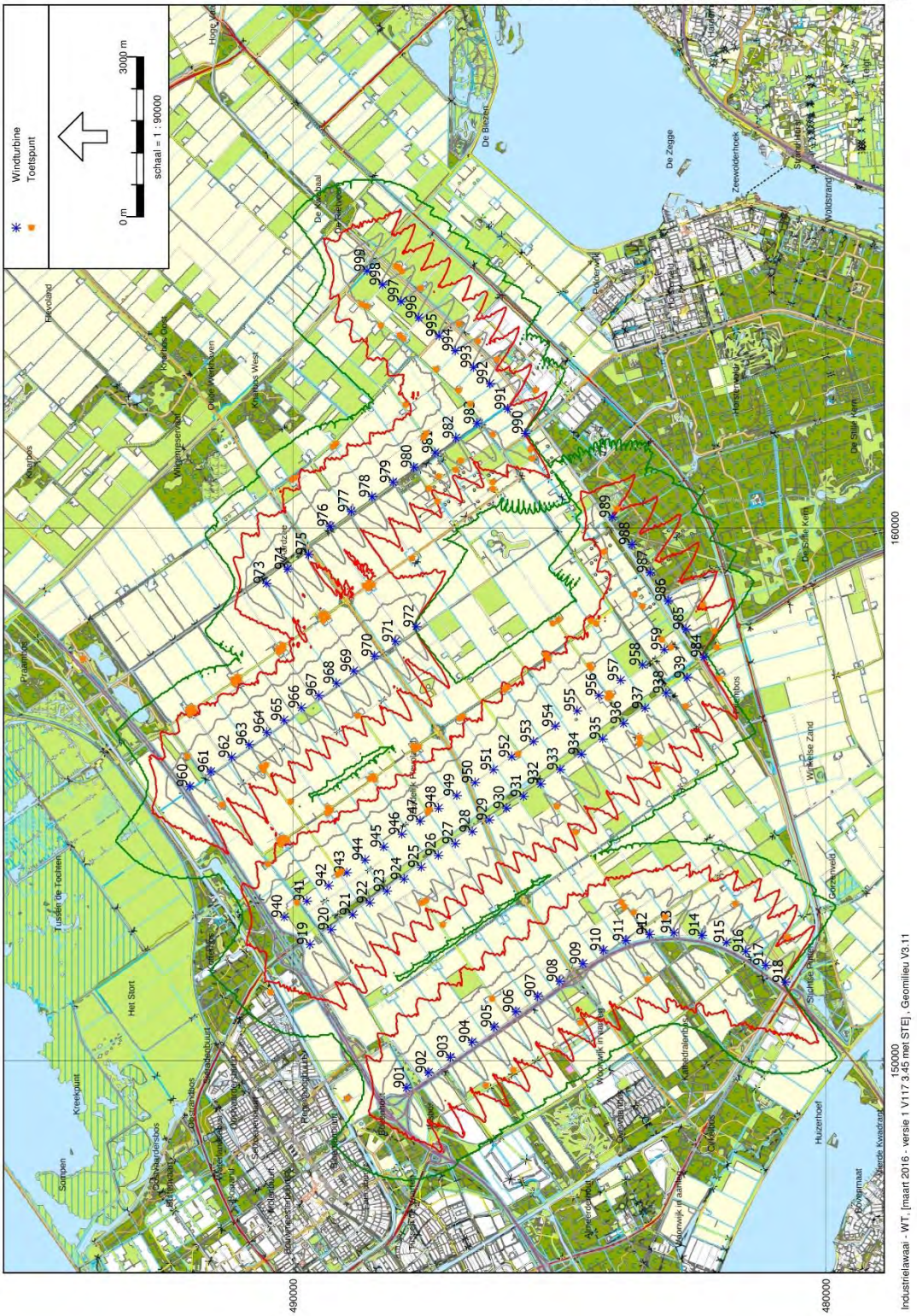


BIJLAGE 64 ALT 3B - SLAGSCHADUWCONTOUREN



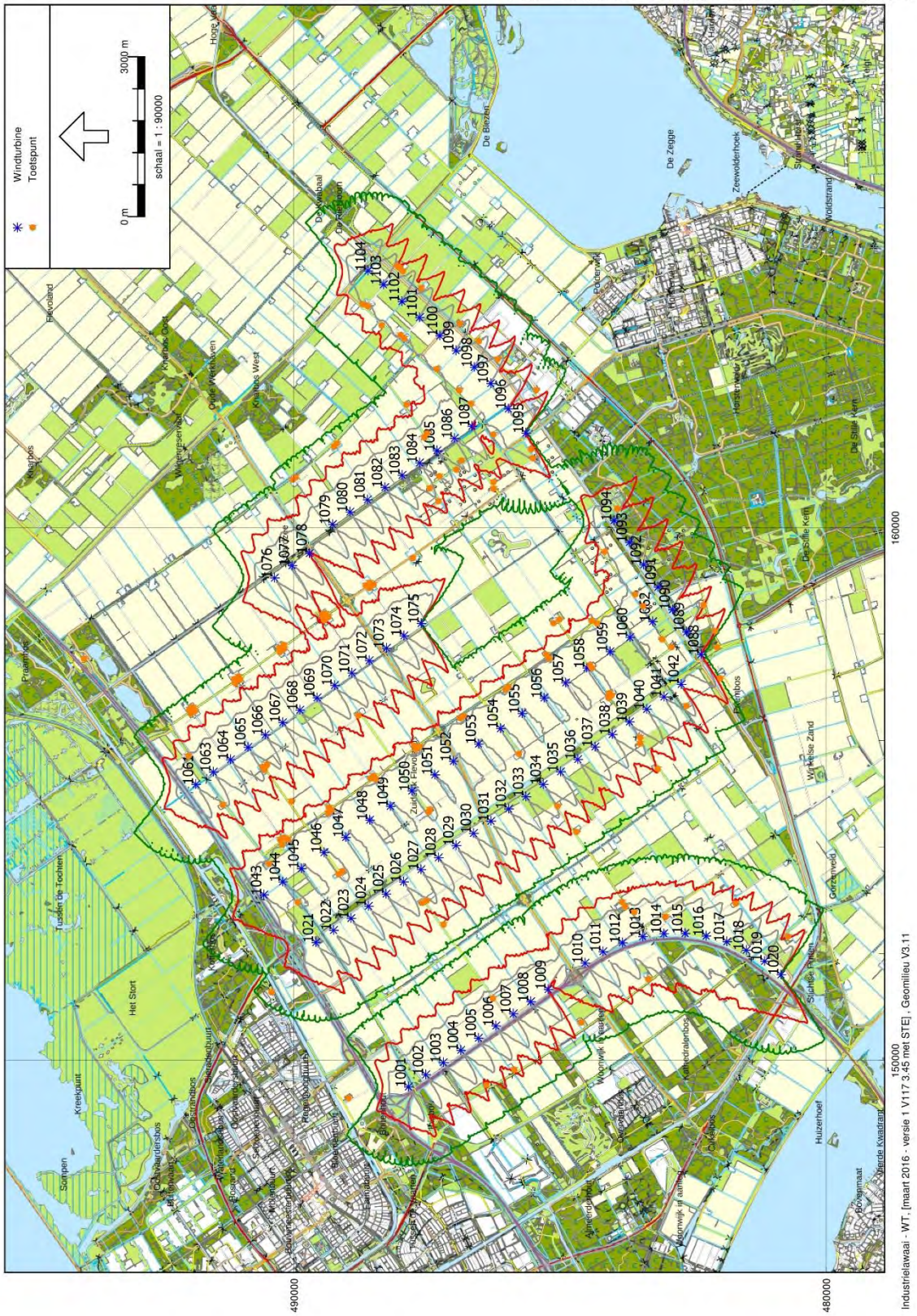
BIJLAGE 65 ALT 3C - SLAGSCHADUWCONTOUREN

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

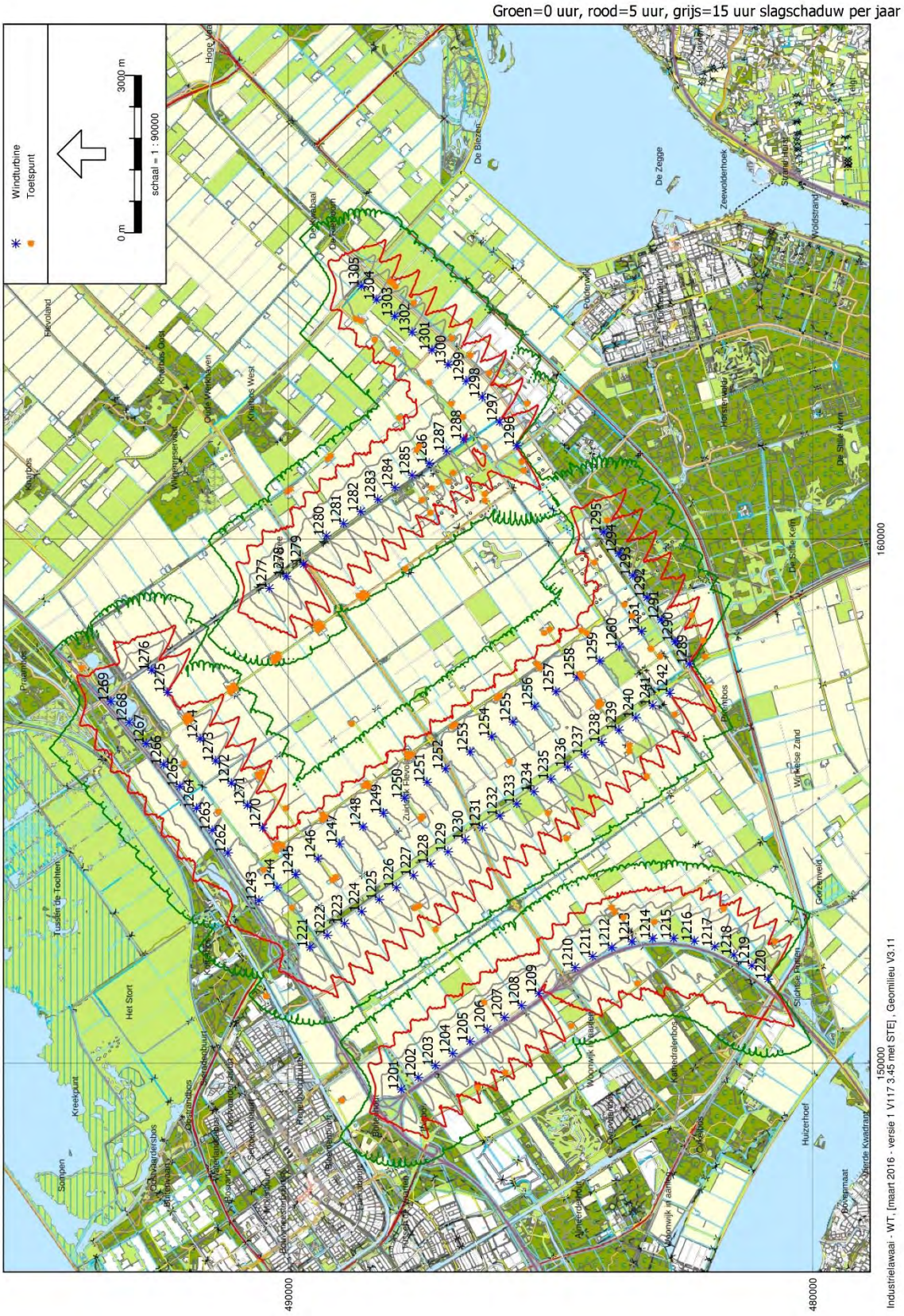


BIJLAGE 66 ALT 4A - SLAGSCHADUWCONTOUREN

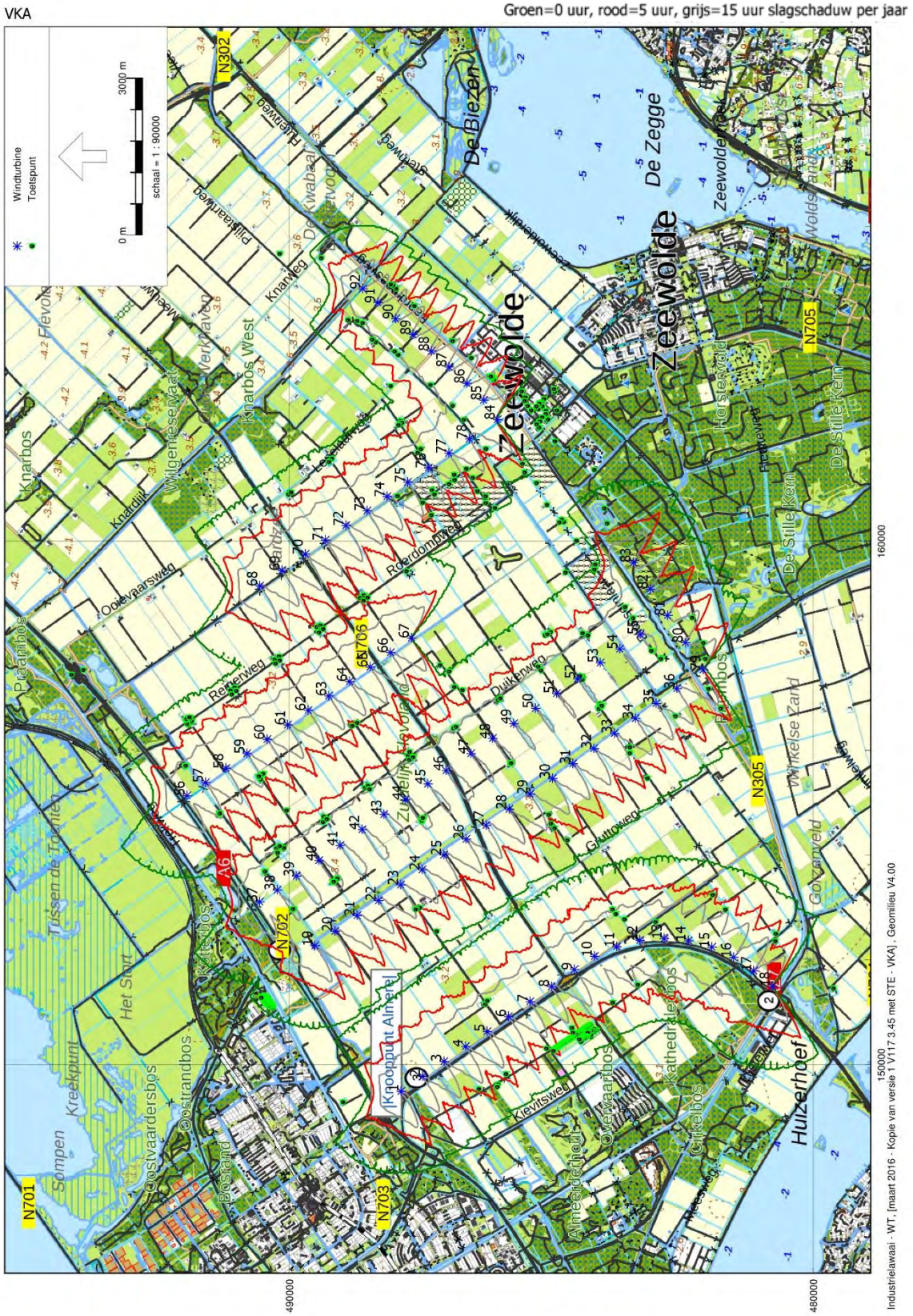
Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



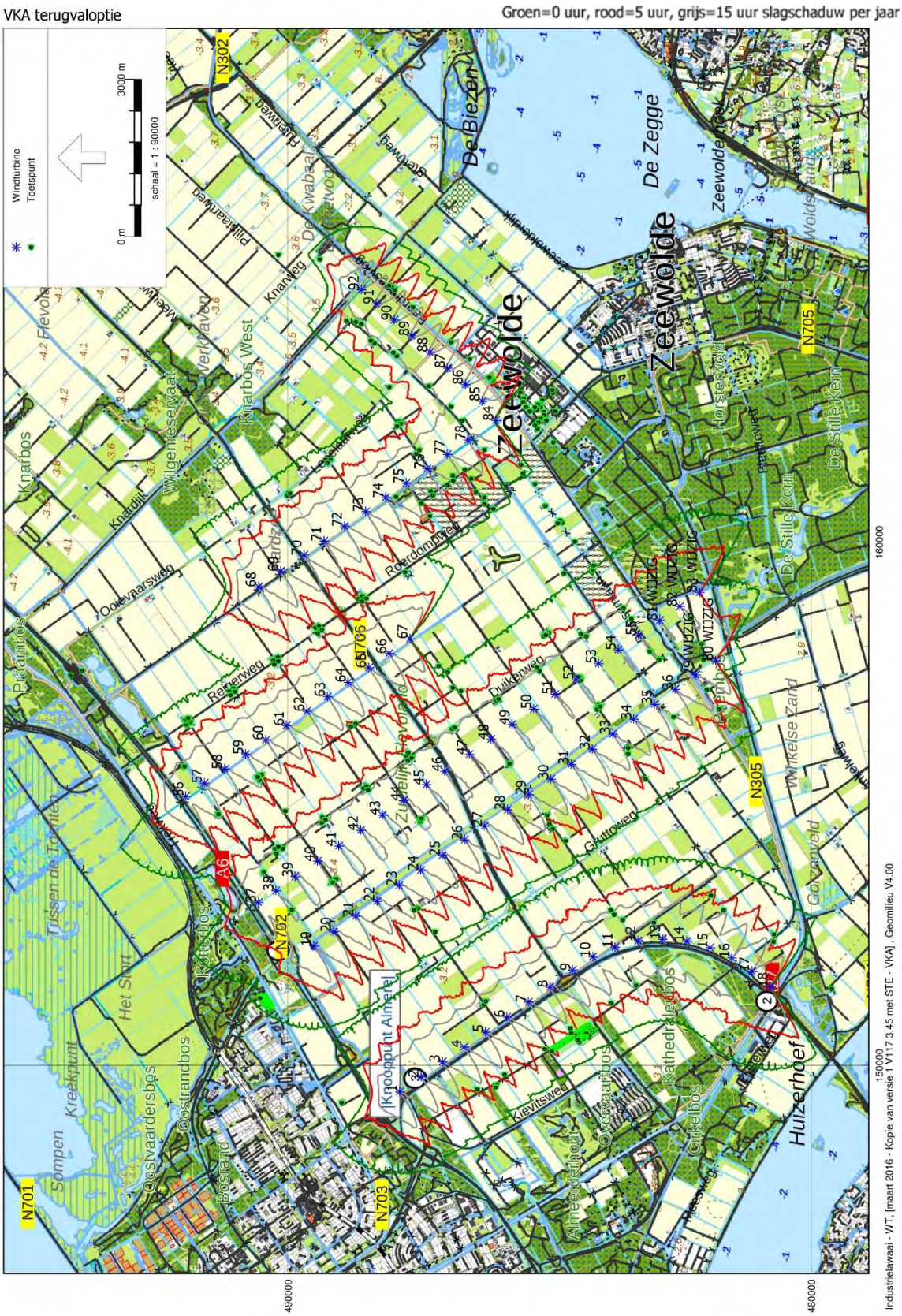
BIJLAGE 67 ALT 4B - SLAGSCHADUWCONTOUREN



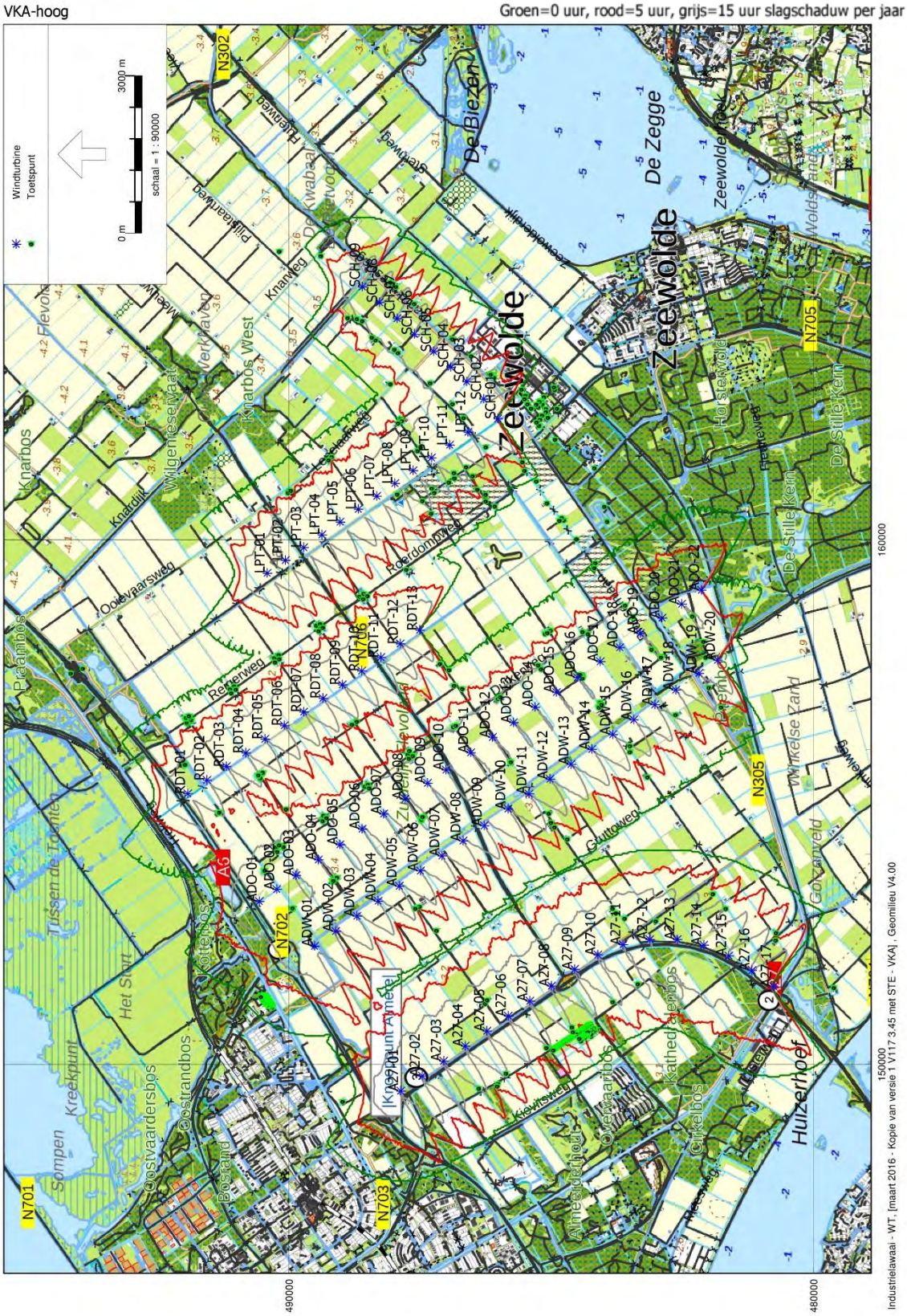
BIJLAGE 68 VKA - SLAGSCHADUWCONTOUREN



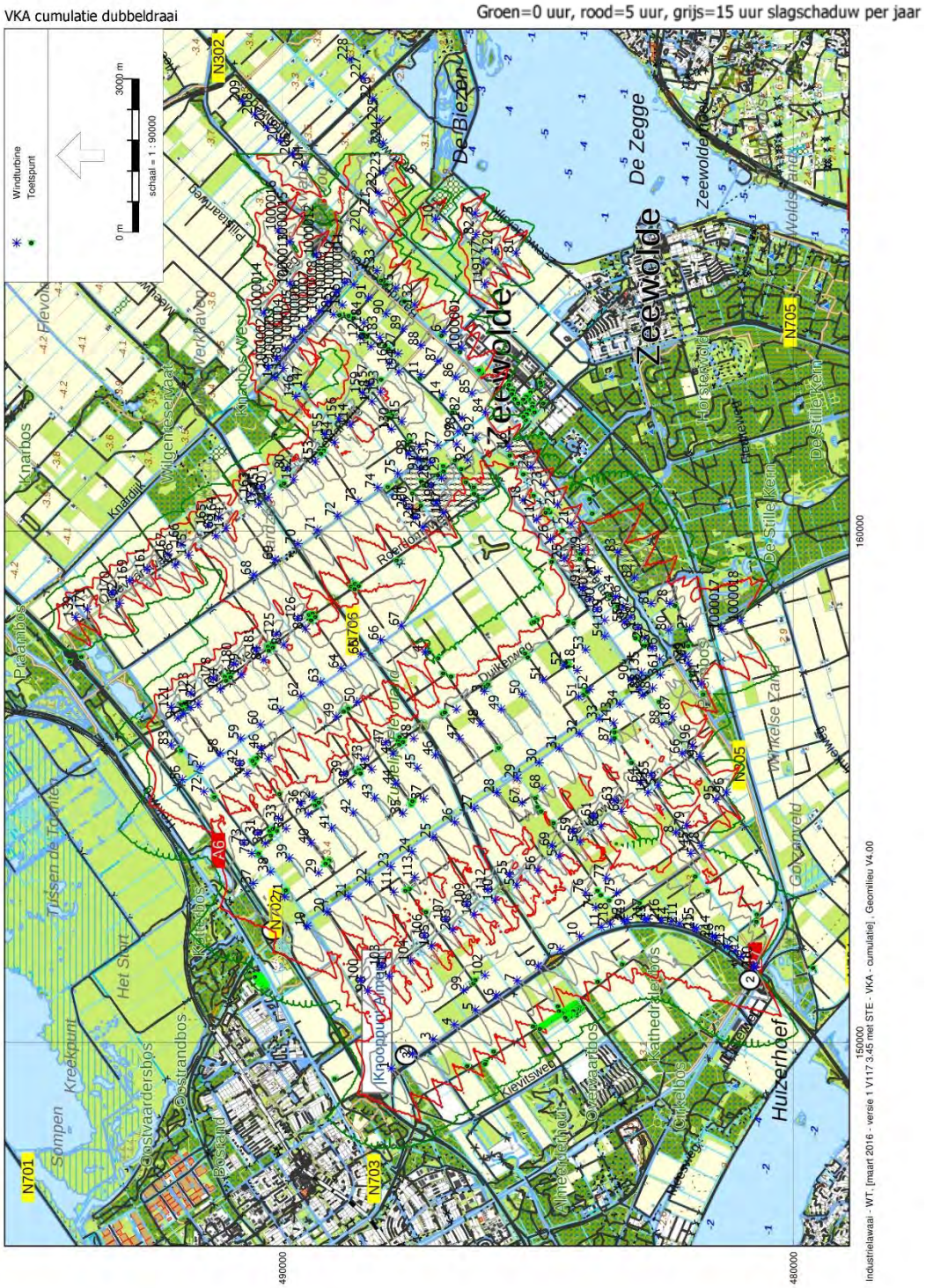
BIJLAGE 69 VKA TERUGVALOPTIE - SLAGSCHADUWCONTOUREN



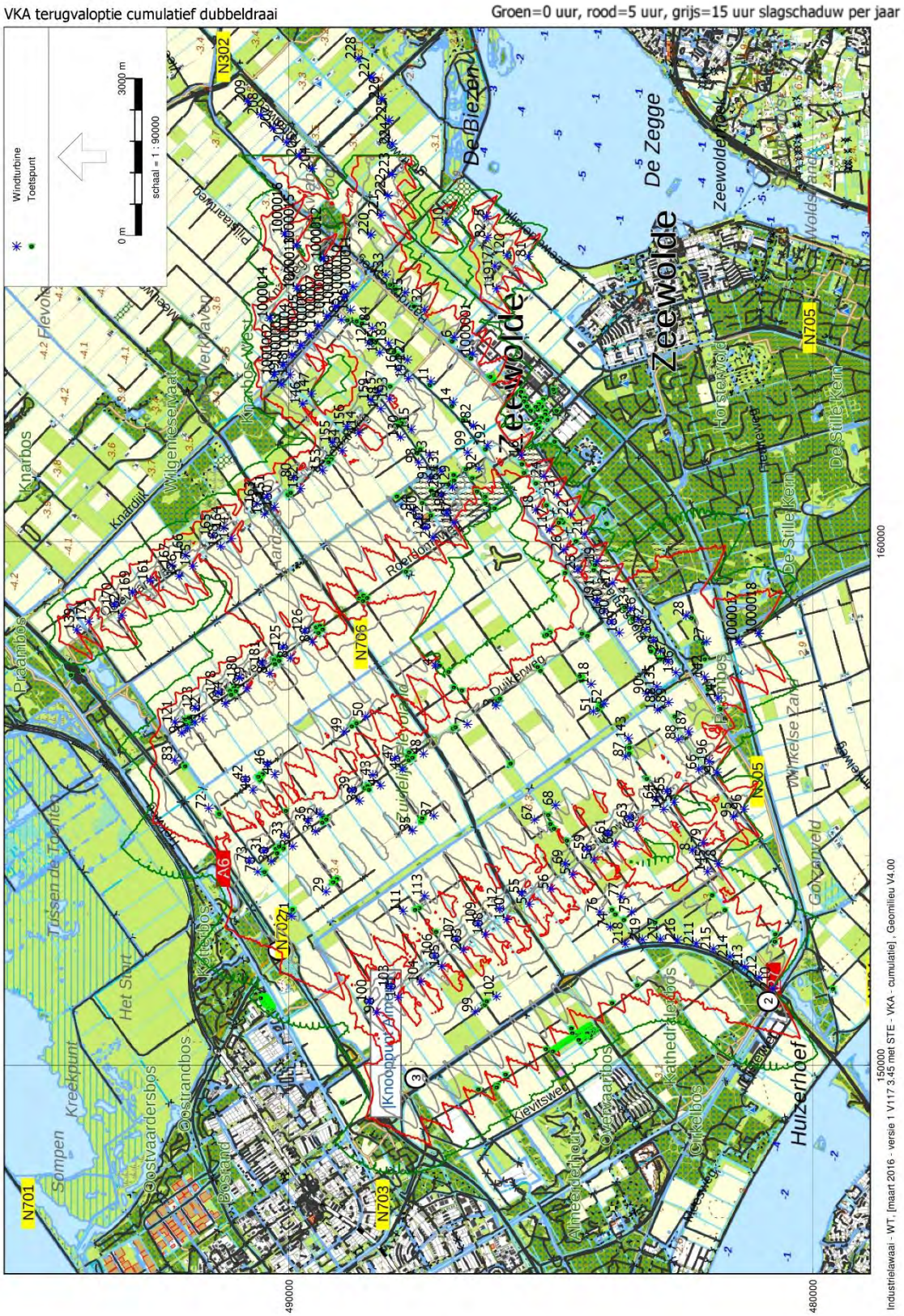
BIJLAGE 70 VKA-HOOG - SLAGSCHADUWCONTOUREN



BIJLAGE 71 VKA – SLAGSCHADUWCONTOUREN CUMULATIEF DUBBELDRAAIPERIODE



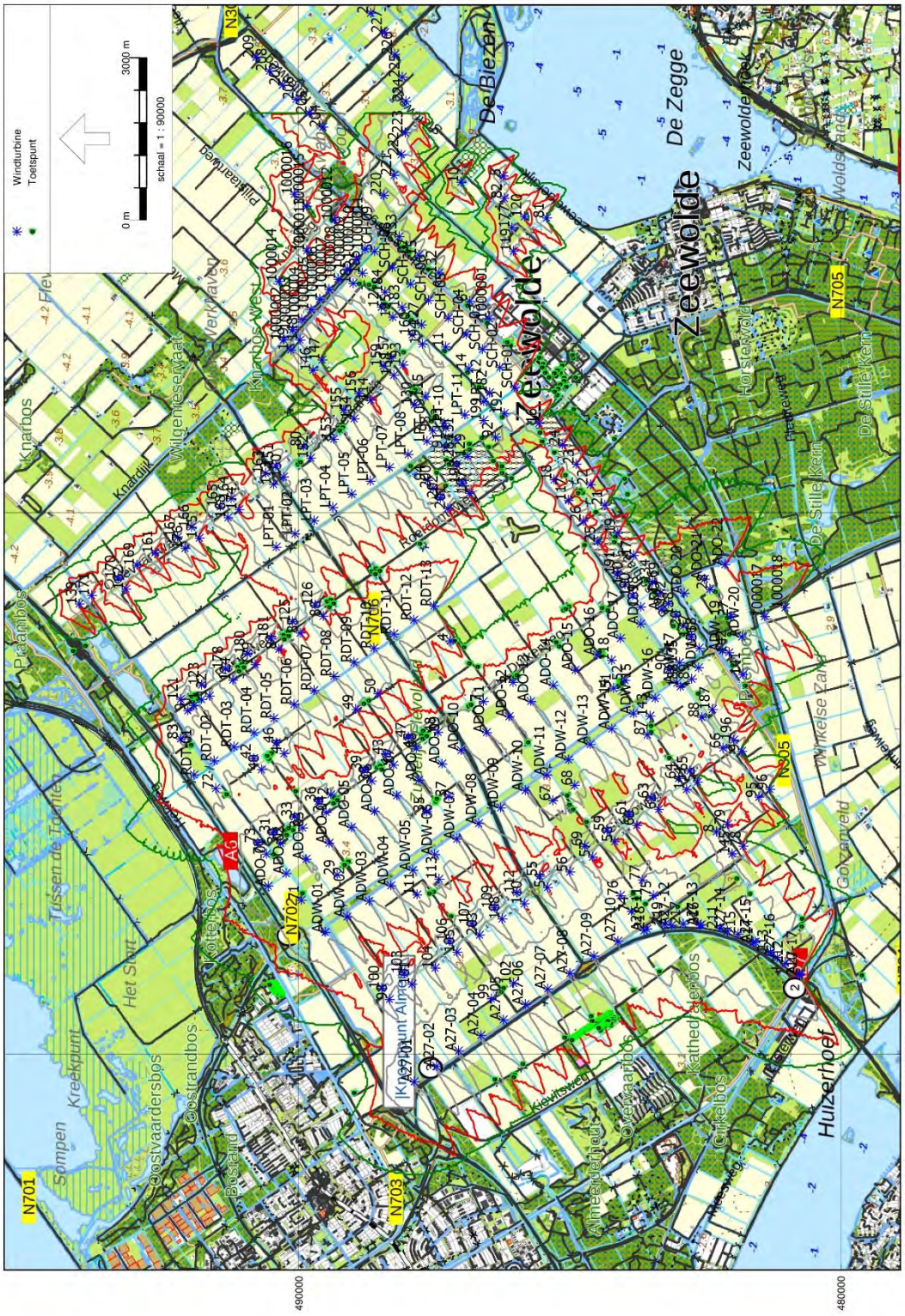
BIJLAGE 72 VKA TERUGVALOPTIE – SLAGSCHADUWCONTOUREN CUMULATIEF DUBBELDRAAIPERIODE



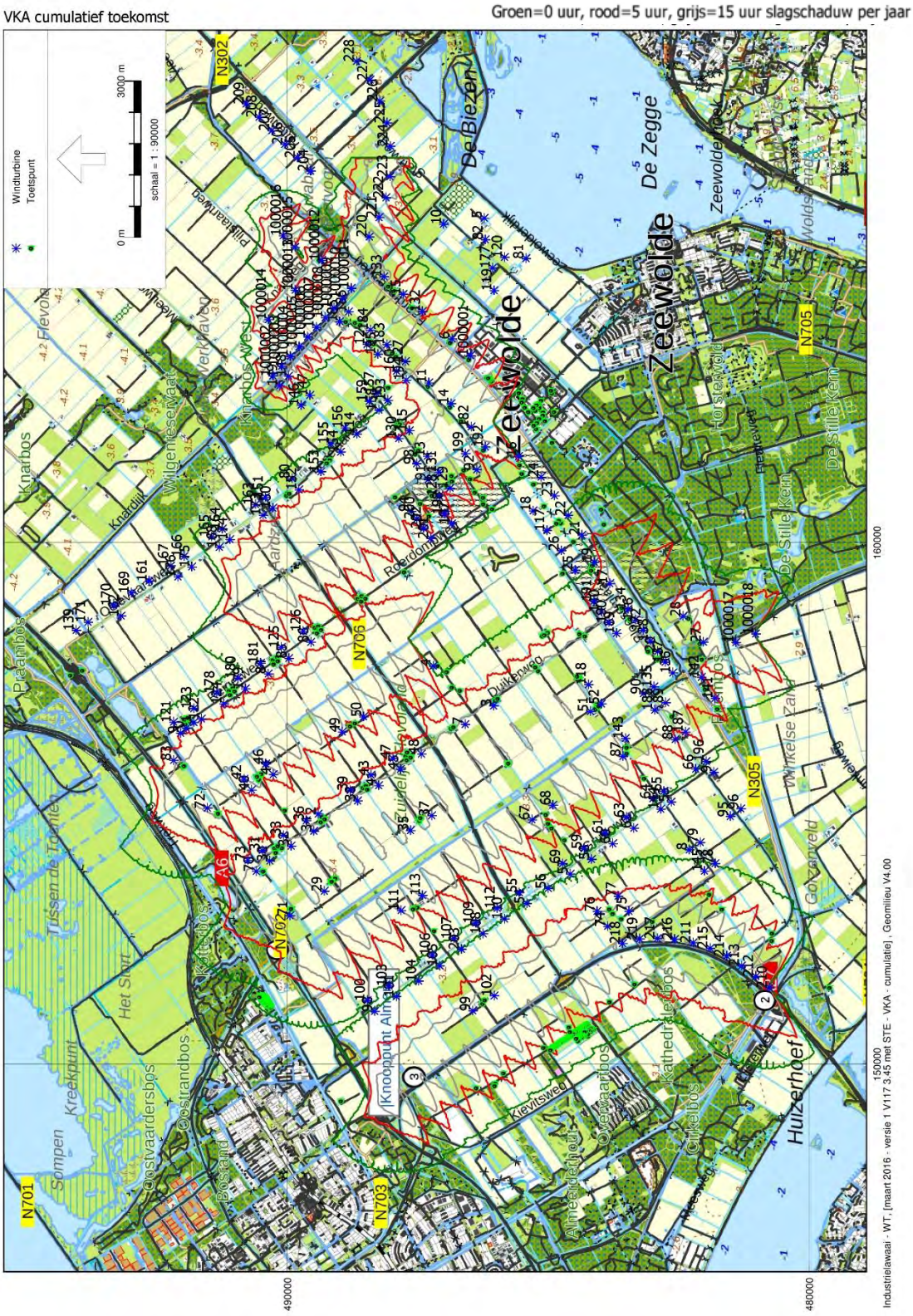
BIJLAGE 73 VKA-HOOG – SLAGSCHADUWCONTOUREN CUMULATIEF DUBBELDRAAIPERIODE

VKA-hoog cumulatief dubbeldraai

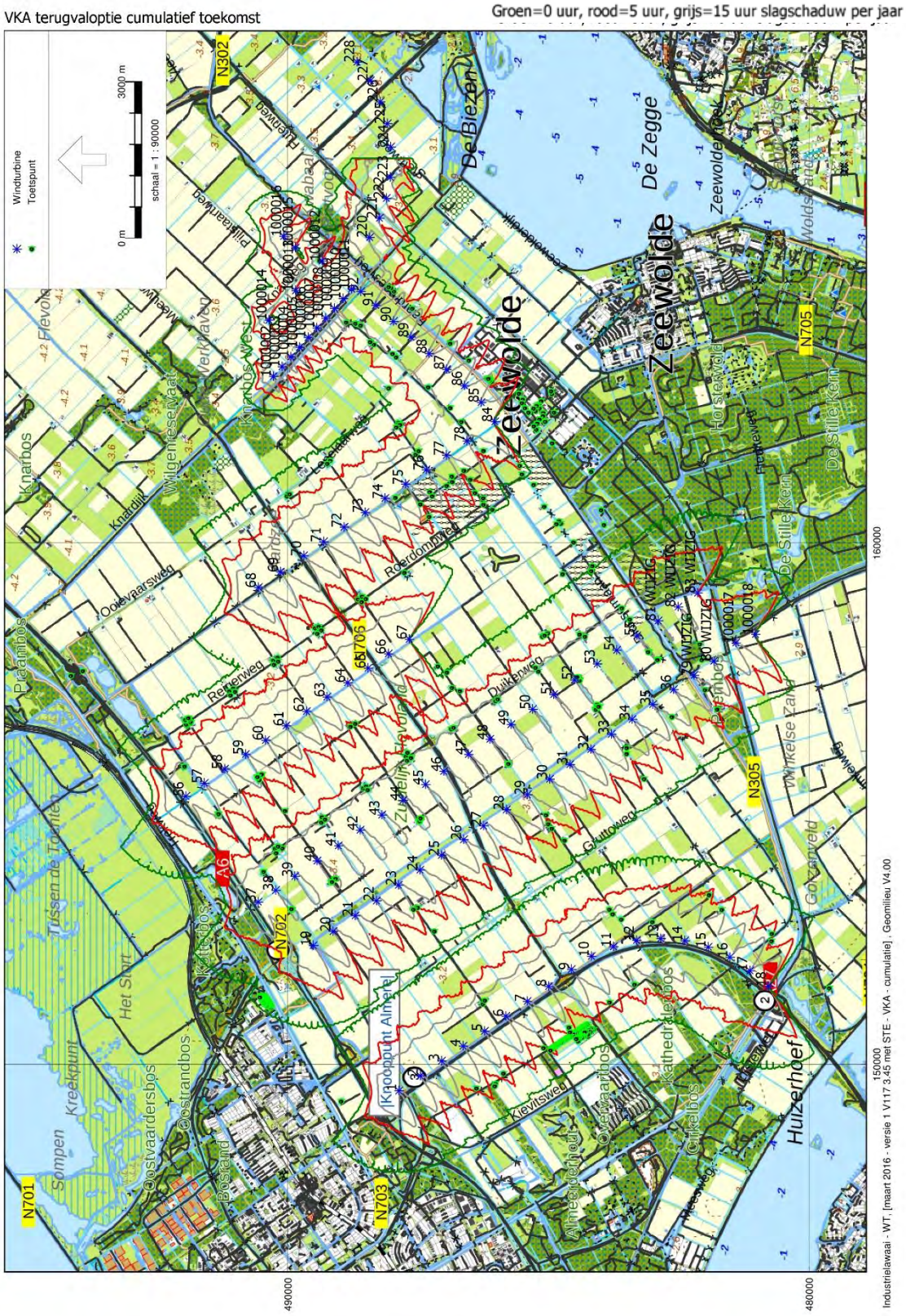
Groen=0 uur, rood=5 uur, grijs=15 uur slagschaduw per jaar



BIJLAGE 74 VKA – SLAGSCHADUWCONTOUREN CUMULATIEF NA DUBBELDRAAIPERIODE



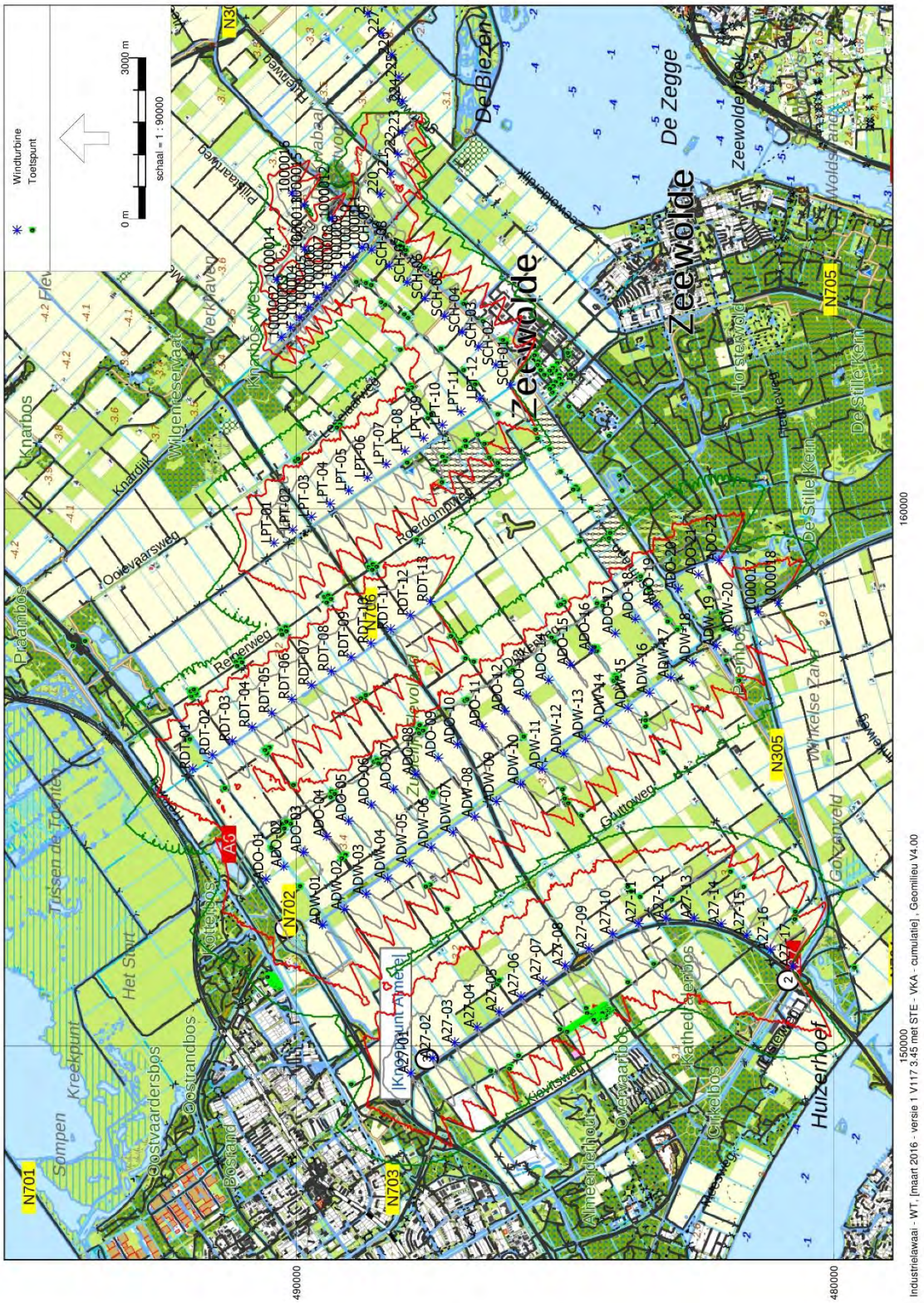
BIJLAGE 75 VKA TERUGVALOPTIE – SLAGSCHADUWCONTOUREN CUMULATIEF NA DUBBELDRAAIPERIODE



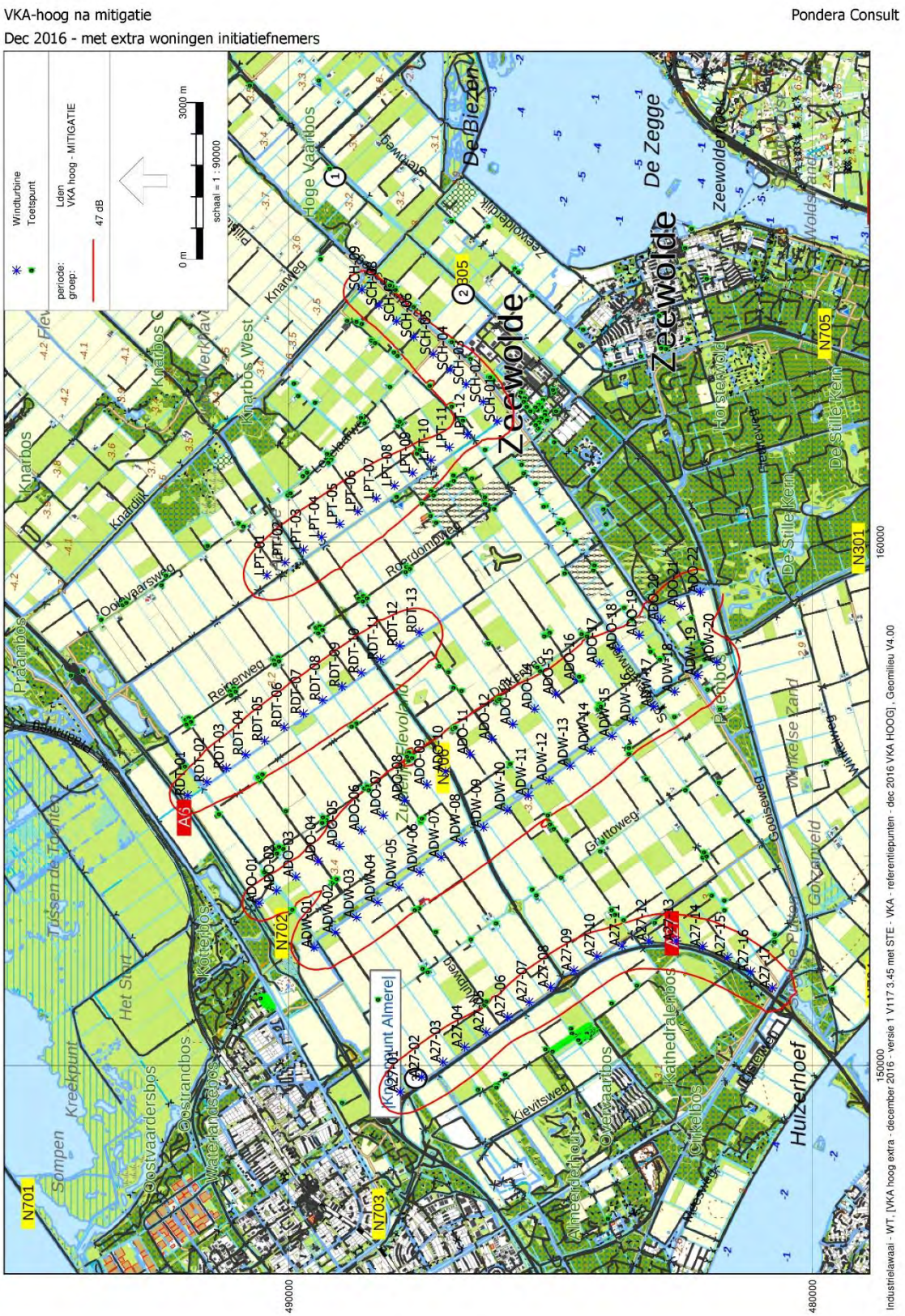
BIJLAGE 76 VKA-HOOG – SLAGSCHADUWCONTOUREN CUMULATIEF NA DUBBELDRAAIPERIODE

VKA-hoog cumulatief toekomst

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



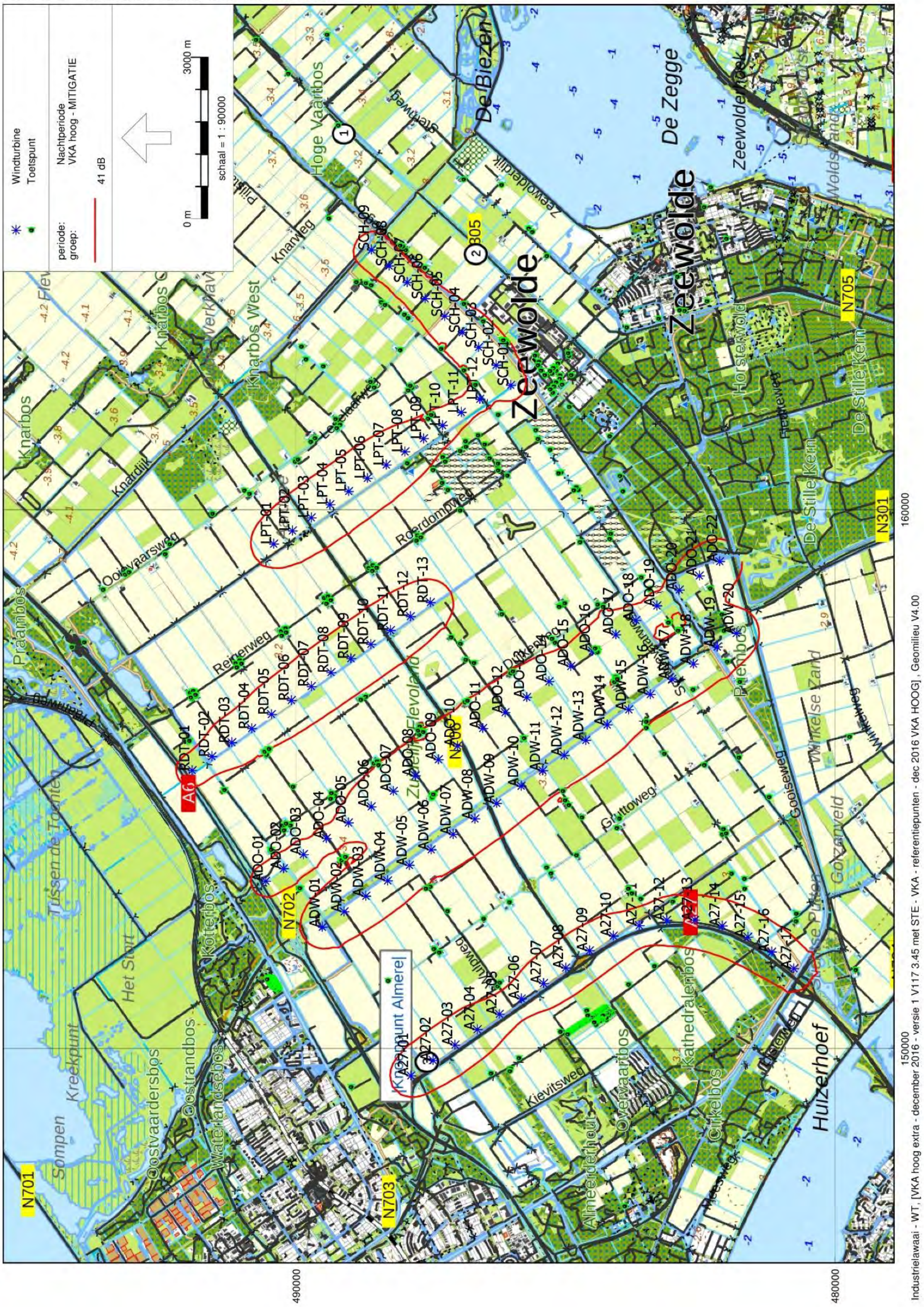
BIJLAGE 77 VKA-HOOG MINDER MITIGATIE- GELUIDCONTOUR L_{DEN}



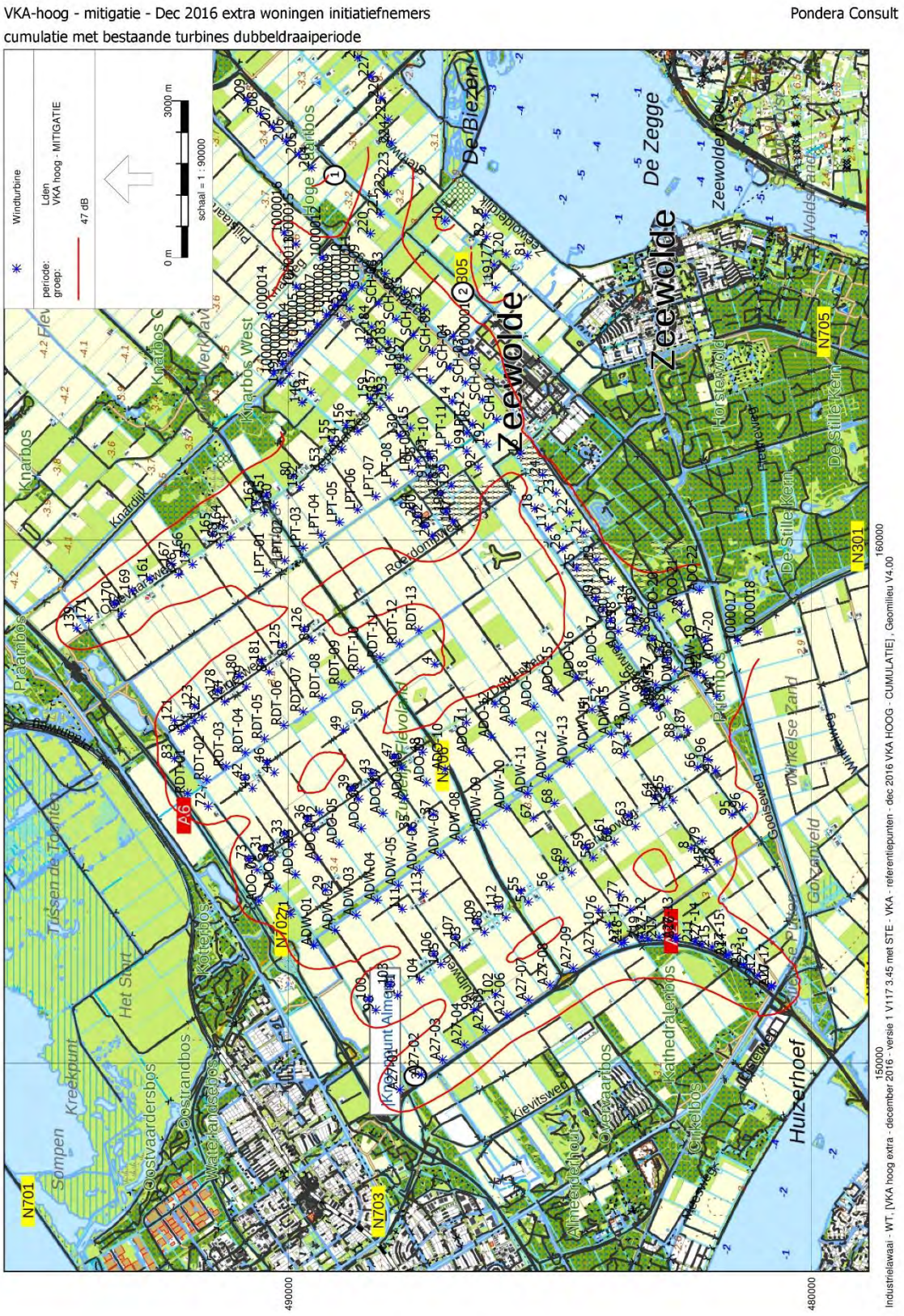
BIJLAGE 78 VKA-HOOG MINDER MITIGATIE- GELUIDCONTOUR L_{NIGHT}

VKA-hoog na mitigatie | Pondera Consult

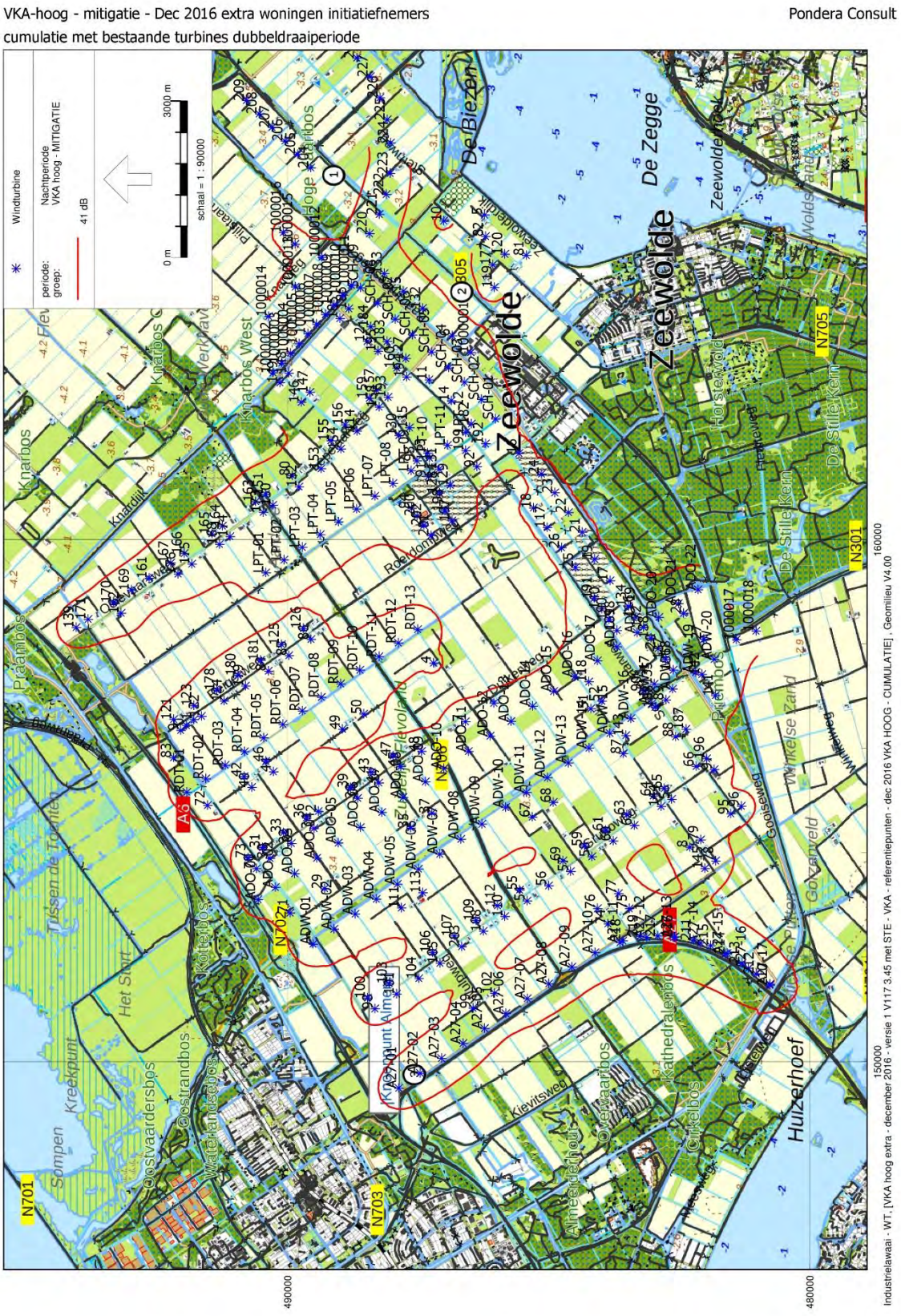
Dec 2016 - met extra woningen initiatiefnemers



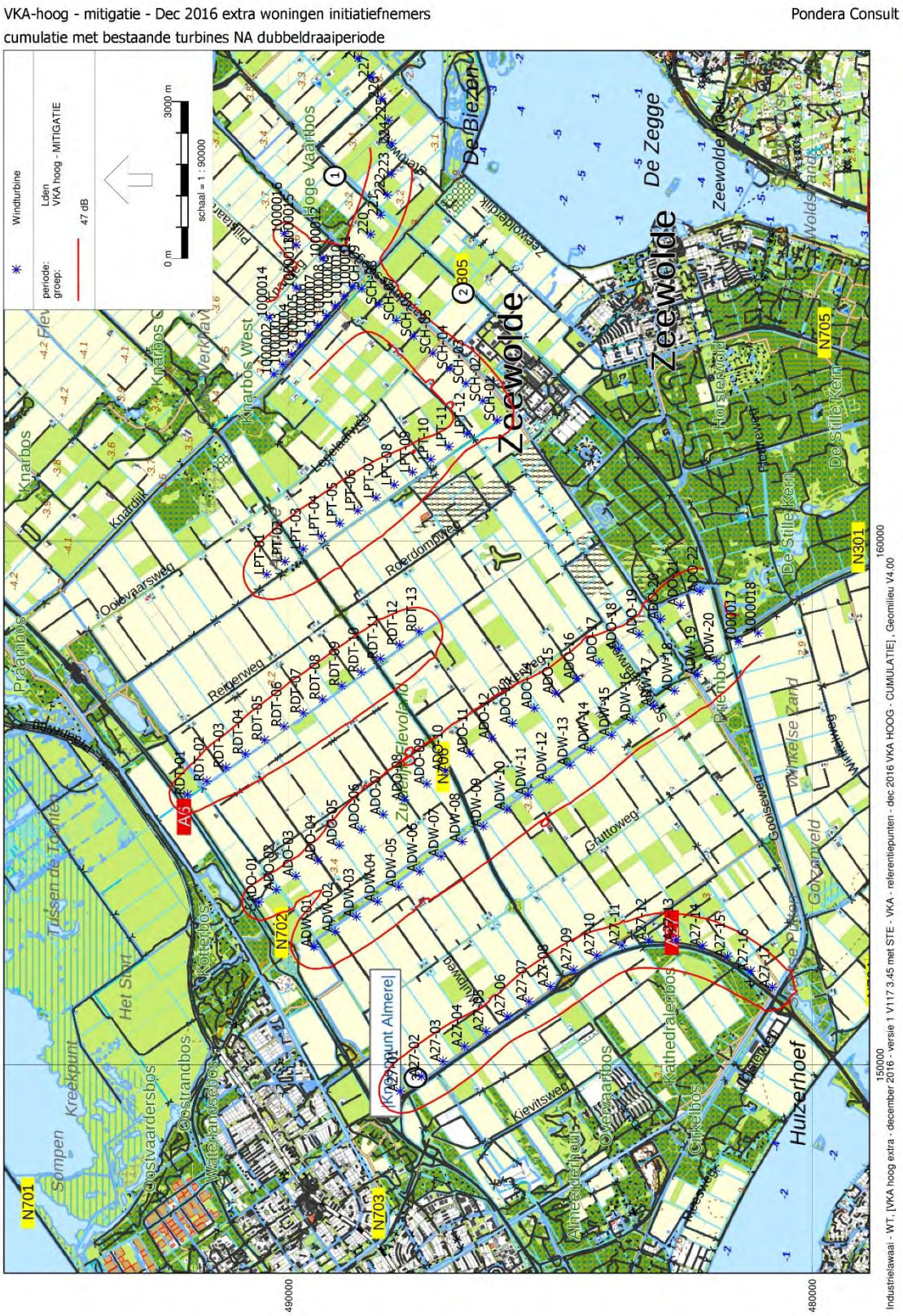
BIJLAGE 79 VKA-HOOG MINDER MITIGATIE- CUMU-DUBBELDRAAI GELUIDCONTOUR L_{DEN}



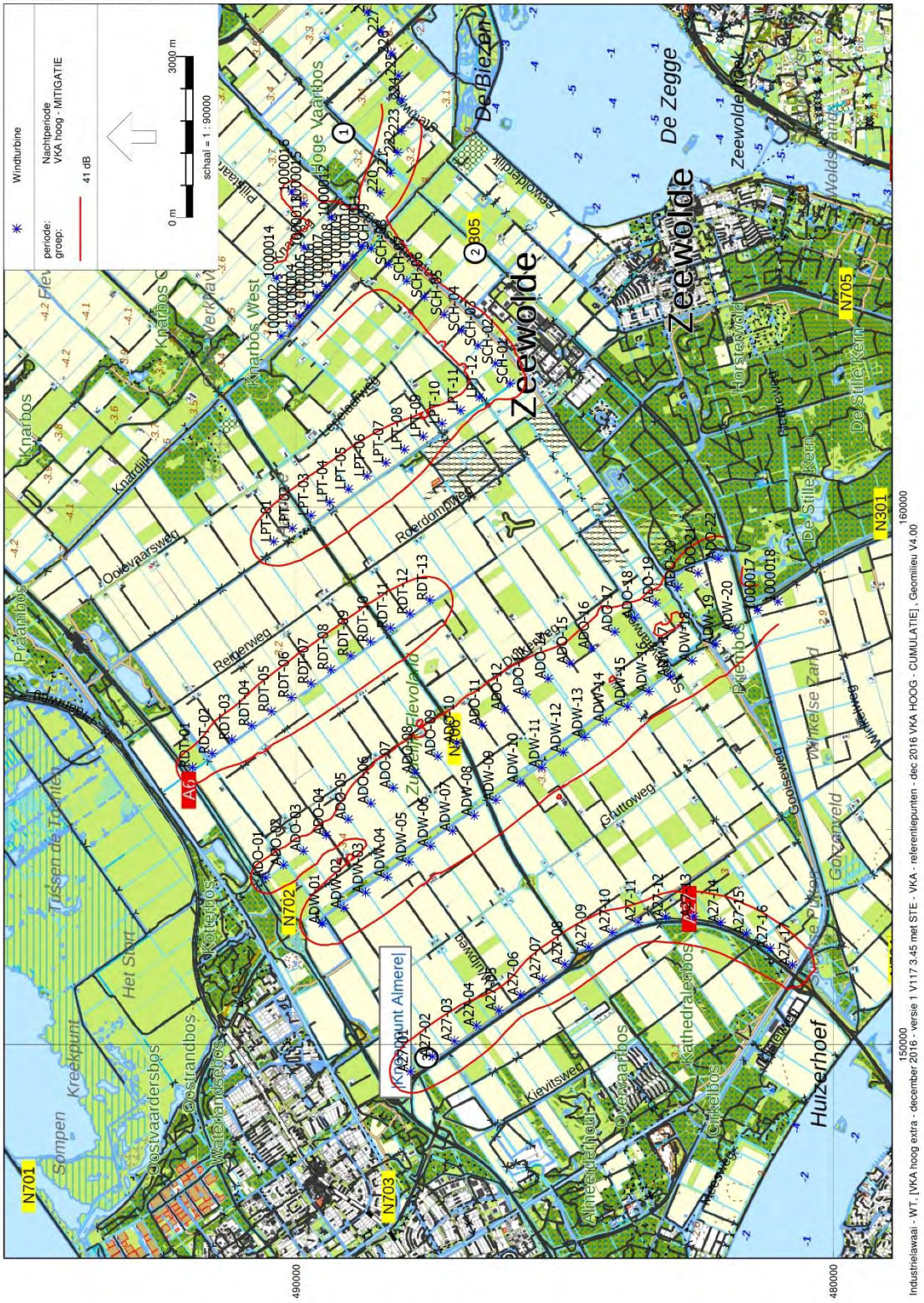
BIJLAGE 80 VKA-HOOG MINDER MITIGATIE- CUMU-DUBBELDRAAI GELUIDCONTOUR L_{NIGHT}



BIJLAGE 81 VKA-HOOG MINDER MITIGATIE- CUMU-NA DUBBELDRAAI GELUIDCONTOUR L_{DEN}



BIJLAGE 82 VKA-HOOG MINDER MITIGATIE- CUMU-NA DUBBELDRAAI GELUIDCONTOUR L_{NIGHT}



BIJLAGE 3B – NOTITIE GELUID

TRANSFORMATORSTATION

GELUIDZONERING TRANSFORMATORSTATION

WINDPARK ZEEWOLDE

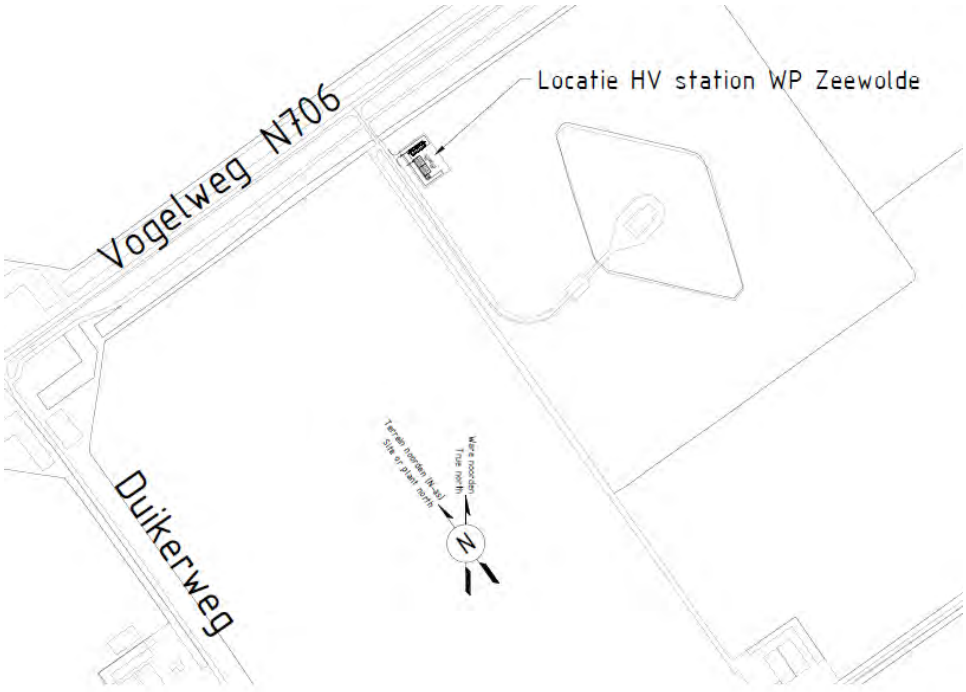
Datum	29 september 2016
Van	D.F. Oude Lansink
Betreft	Geluidzonering transformatorstation Windpark Zeewolde
Projectnummer	715027

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 straftoeslag 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 Handreiking 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 geluidzonering voor het transformatorstation in het inpassingsplan vast te leggen.

Bijlage 1: invoergegevens berekening

Transformator
3 aug 2016, 13:54

Pondera Consult

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

Transformator
3 aug 2016, 13:54

Pondera Consult

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

Rekenraster

Id	Omschr.	X	Y	Hoogte	MaaiveId	DeltaX	DeltaY	X-aantal	Y-aantal
1	rekengrid	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
50100000	N	155811,66	487547,06	12,31	0,00	0,80
50100000	N	155774,32	487678,83	7,31	0,00	0,80
50100000	N	156347,17	486819,97	7,87	0,00	0,80
50100000	N	156358,60	486930,52	0,33	0,00	0,80
50100000	J	156359,12	486774,26	0,43	0,00	0,80
50100000	N	156428,40	486874,50	8,17	0,00	0,80
50100000	N	156447,26	486813,81	9,11	0,00	0,80
50100000	N	156432,01	486760,07	9,74	0,00	0,80
50100000	N	156406,28	486709,97	5,22	0,00	0,80
50100000	N	156444,16	486759,68	11,84	0,00	0,80

Geluidbron - transformatoren

Groep	Naam	X	Y	Hoogte	Cb(u)(D)	Cb(u)(A)	Cb(u)(N)
Transformatoren - oostzijde	1,00	156739,52	487574,46	3,00	12,00	4,00	8,00
Transformatoren - oostzijde	2,00	156739,52	487574,46	3,00	12,00	4,00	8,00
Transformatoren - westzijde	1,00	156714,45	487556,73	3,00	12,00	4,00	8,00
Transformatoren - westzijde	2,00	156714,45	487556,73	3,00	12,00	4,00	8,00
Transformatoren - zuidzijde	1,00	156741,57	487528,33	3,00	12,00	4,00	8,00
Transformatoren - zuidzijde	2,00	156741,57	487528,33	3,00	12,00	4,00	8,00
Transformatoren - noordzijde	1,00	156766,05	487541,90	3,00	12,00	4,00	8,00
Transformatoren - noordzijde	2,00	156766,05	487541,90	3,00	12,00	4,00	8,00

Groep	Naam.	Lwr 31	Lwr 63	Lwr 125	Lwr 250	Lwr 500
Transformatoren - oostzijde	1,00	75,38	78,18	79,58	89,48	87,78
Transformatoren - oostzijde	2,00	75,38	78,18	79,58	89,48	87,78
Transformatoren - westzijde	1,00	75,38	78,18	79,58	89,48	87,78
Transformatoren - westzijde	2,00	75,38	78,18	79,58	89,48	87,78
Transformatoren - zuidzijde	1,00	75,38	78,18	79,58	89,48	87,78
Transformatoren - zuidzijde	2,00	75,38	78,18	79,58	89,48	87,78
Transformatoren - noordzijde	1,00	75,38	78,18	79,58	89,48	87,78
Transformatoren - noordzijde	2,00	75,38	78,18	79,58	89,48	87,78

Groep	Naam.	Lwr 1k	Lwr 2k	Lwr 4k	Lwr 8k	Lwr Totaal
Transformatoren - oostzijde	1,00	89,68	85,48	82,18	75,88	95,00
Transformatoren - oostzijde	2,00	89,68	85,48	82,18	75,88	95,00
Transformatoren - westzijde	1,00	89,68	85,48	82,18	75,88	95,00
Transformatoren - westzijde	2,00	89,68	85,48	82,18	75,88	95,00
Transformatoren - zuidzijde	1,00	89,68	85,48	82,18	75,88	95,00
Transformatoren - zuidzijde	2,00	89,68	85,48	82,18	75,88	95,00
Transformatoren - noordzijde	1,00	89,68	85,48	82,18	75,88	95,00
Transformatoren - noordzijde	2,00	89,68	85,48	82,18	75,88	95,00

Bijlage 2: rekenresultaten

Rekenresultaten geluidbron zuidzijde

Naam	Omschrijving	Hoogte	Dag	Avond	Nacht	etmaal
B31	Duikerweg 6	5,00	23,91	23,91	23,91	33,91
B24	Duikerweg 2	5,00	24,43	24,43	24,43	34,43
1115	Dodaarsweg 53	5,00	15,89	15,89	15,89	25,89
1113	Duikerweg 9	5,00	20,97	20,97	20,97	30,97
1112	Duikerweg 13	5,00	21,13	21,13	21,13	31,13
1111	Duikerweg 5	5,00	22,66	22,66	22,66	32,66

Rekenresultaten geluidbron noordzijde

Naam	Omschrijving	Hoogte	Dag	Avond	Nacht	etmaal
B31	Duikerweg 6	5,00	23,63	23,63	23,63	33,63
B24	Duikerweg 2	5,00	24,14	24,14	24,14	34,14
1115	Dodaarsweg 53	5,00	16,15	16,15	16,15	26,15
1113	Duikerweg 9	5,00	21,08	21,08	21,08	31,08
1112	Duikerweg 13	5,00	21,18	21,18	21,18	31,18
1111	Duikerweg 5	5,00	22,64	22,64	22,64	32,64

Rekenresultaten geluidbron oostzijde

Naam	Omschrijving	Hoogte	Dag	Avond	Nacht	etmaal
B31	Duikerweg 6	5,00	23,89	23,89	23,89	33,89
B24	Duikerweg 2	5,00	24,37	24,37	24,37	34,37
1115	Dodaarsweg 53	5,00	15,49	15,49	15,49	25,49
1113	Duikerweg 9	5,00	20,70	20,70	20,70	30,70
1112	Duikerweg 13	5,00	20,86	20,86	20,86	30,86
1111	Duikerweg 5	5,00	22,76	22,76	22,76	32,76

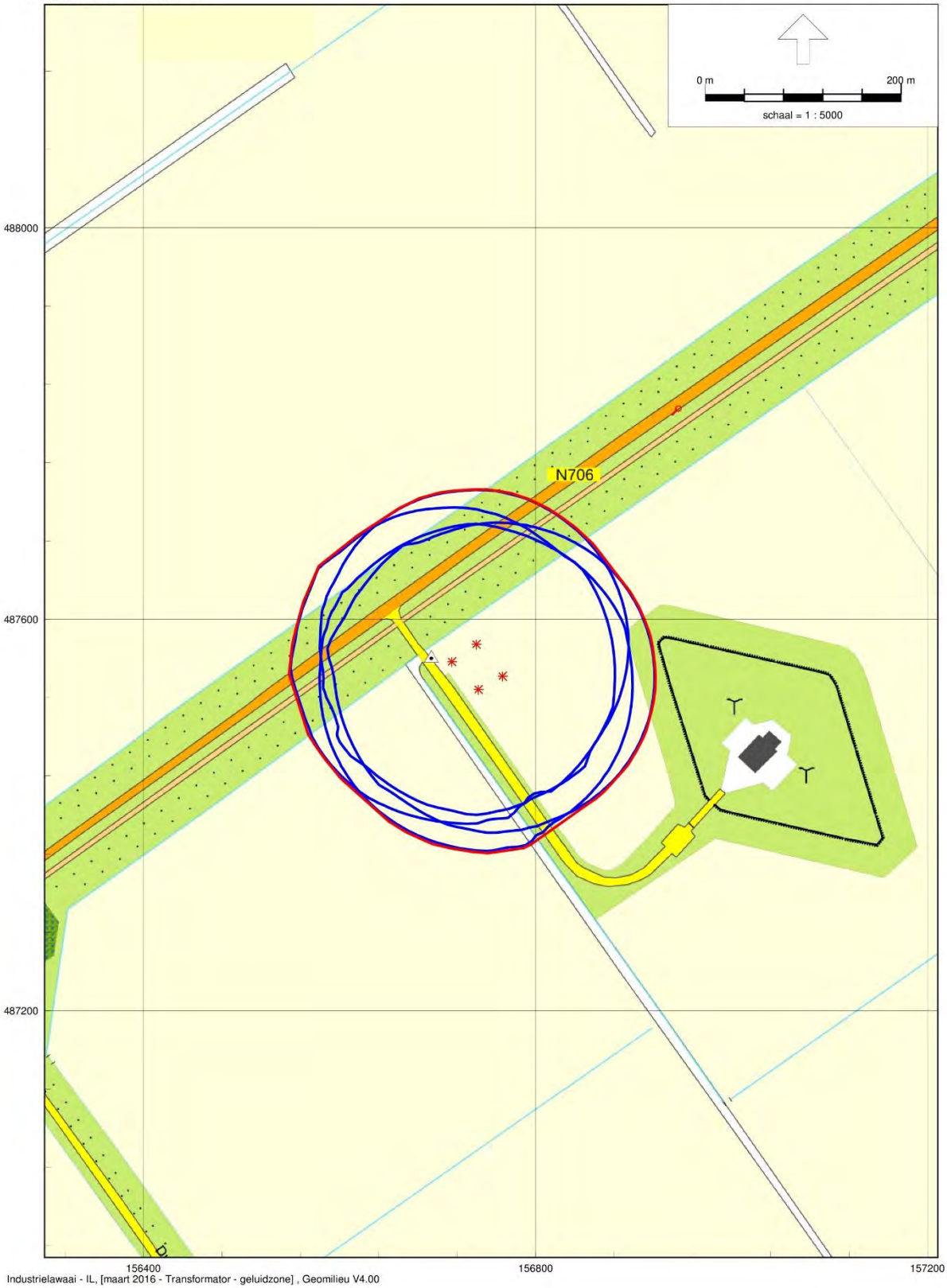
Rekenresultaten geluidbron westzijde

Naam	Omschrijving	Hoogte	Dag	Avond	Nacht	Etmaal
B31	Duikerweg 6	5,00	23,76	23,76	23,76	33,76
B24	Duikerweg 2	5,00	24,32	24,32	24,32	34,32
1115	Dodaarsweg 53	5,00	15,94	15,94	15,94	25,94
1113	Duikerweg 9	5,00	21,25	21,25	21,25	31,25
1112	Duikerweg 13	5,00	21,34	21,34	21,34	31,34
1111	Duikerweg 5	5,00	22,54	22,54	22,54	32,54

Bijlage 3: contouren

Geluidbelasting inclusief:
3 dB(A) reflectietoeslag
5 dB(A) straftoeslag tonaliteit

Blauw = 50 dB(A) voor transformatoren oost, west, zuid en noord
Rood = omhullende 50 dB(A) contour voor zonering



BIJLAGE 3C

EFFECT VERSCHUIVING TURBINES SCH 06

EN SCH 09

WP ZEEWOLDE - EFFECT VERSCHUIVING TURBINES SCH 06 EN SCH 09

Datum	1-12-2016
Van	D.F. Oude Lansink, Pondera Consult
Betreft	WP Zeewolde, effect geluid en slagschaduw door verschuiving van turbines SCH 06 en SCH 07
Projectnummer	716034

Inleiding

In het kader van de Wabo vergunningaanvragen voor Windpark Zeewolde zijn akoestische berekeningen en berekeningen aan slagschaduwduur gedaan. De uitgangspunten en resultaten van deze berekeningen zijn vastgelegd in “Onderzoek Akoestiek en Slagschaduw vergunning Windpark Zeewolde”, d.d. 29 november 2016 met projectnummer 716034, opgesteld door Pondera Consult.

De huidige memo betreft de effecten op geluid en slagschaduw door een kleine wijziging van de uitgangspunten, namelijk de minimale verplaatsing van twee van de turbines, te weten turbine SCH 06 en turbine SCH 09. De oude en nieuwe coördinaten staan in onderstaande tabel weergegeven.

Turbine	Oude coördinaat		Gewijzigde coördinaat	
	X	Y	X	Y
SCH 06	163910,00	487601,80	163906,65	487598,03
SCH 09	164812,80	488597,00	164804,73	488588,13

Omschrijving berekeningen

De berekeningen zijn uitgevoerd met dezelfde rekenmodellen als die, welke zijn gebruikt voor het bovengenoemde rapporten. Voor deze berekening zijn enkel de twee turbines verschoven door de boven in de tabel weergegeven coördinaten in te voeren. De rekenresultaten voor zowel geluid als slagschaduw zijn weergegeven in de bijlagen hieronder.

Bespreking resultaten

Uit de rekenresultaten blijkt dat het effect van de verschuiving voor geluid en slagschaduw zeer klein is. De geluidbelasting blijft op de meeste toetspunten gelijk aan die uit het eerder genoemde hoofdrapport De maximale verhoging op overige toetspunten bedraagt 0,05 dB, de maximale verlaging 0,08 dB. Voor slagschaduw blijft de jaarlijkse slagschaduwduur op 57 van de 60 referentiepunten ongewijzigd. Op referentiepunt 3 neemt de jaarlijkse verwachte slagschaduwduur af met 2 minuten, op referentiepunt 4 is de afname 11 minuten. Alleen op referentiepunt 49 neemt de jaarlijks verwachte slagschaduwduur toe, maar met slechts 1 minuut.

Bijlage 1 – rekenresultaten geluid

Geluidbelasting WP Zeewolde na verschuiving turbines SCH06 en SCH09 , gemitigeerd conform hoofdrapport
Hier worden enkel toetspunten getoond voor welke de geluidbelasting wijzigt, de geluidbelasting op alle overige toetspunten blijft gelijk

Naam	Omschrijving	Hoogte	Dag	Avond	Nacht	Lden
3	Baardmeesweg 5	5	41,64	41,51	40,53	47,19
4	Baardmeesweg 9	5	41,79	41,40	40,63	47,27
49	Schollevaarweg 13	5	40,69	40,58	39,51	46,20
1072	Marconiweg 10 - op gezoneerd terrein	5	33,14	33,02	32,93	39,36
1077	Bloesemlaan 8	5	30,16	29,76	28,49	35,28
1085	Landbouwweg 51 - op gezoneerd terrein	5	35,92	35,81	35,82	42,23
1093	Landbouwweg 67 - op gezoneerd terrein	5	37,68	37,61	37,69	44,07
1119	Schollevaarweg 4	5	39,13	38,87	38,08	44,71
1121	Schollevaarweg 2A	5	38,13	38,07	37,40	43,97
1122	Knarweg 44	5	32,26	32,26	31,90	38,38
B04	Baardmeesweg 1	5	41,49	41,41	40,47	47,12
B05	Baardmeesweg 13	5	42,29	42,32	42,23	48,64
B07	Baardmeesweg 3	5	41,78	41,72	40,79	47,43
B59	Schollevaarweg 1	5	39,42	39,34	38,40	45,05
B62	Schollevaarweg 5	5	39,98	39,83	38,89	45,55
B63	Schollevaarweg 6	5	39,43	39,16	38,46	45,07

Toename geluidbelasting WP Zeewolde (gemitigeerd conform hoofdrapport) na verschuiving turbines SCH06 en SCH09
Hier worden enkel toetspunten getoond voor welke de geluidbelasting wijzigt, de geluidbelasting op alle overige toetspunten blijft gelijk

Naam	Omschrijving	Hoogte	Dag	Avond	Nacht	Lden
3	Baardmeesweg 5	5	0,03	0,02	0,04	0,03
4	Baardmeesweg 9	5	-0,01	-0,01	-0,01	-0,01
49	Schollevaarweg 13	5	0,00	0,01	0,00	0,00
1072	Marconiweg 10 - op gezoneerd terrein	5	0,00	0,00	0,01	0,01
1077	Bloesemlaan 8	5	0,01	0,00	0,01	0,01
1085	Landbouwweg 51 - op gezoneerd terrein	5	0,00	0,01	0,00	0,01
1093	Landbouwweg 67 - op gezoneerd terrein	5	0,01	0,00	0,00	0,00
1119	Schollevaarweg 4	5	0,00	0,00	0,01	0,01
1121	Schollevaarweg 2A	5	0,02	0,02	0,02	0,02
1122	Knarweg 44	5	-0,07	-0,07	-0,08	-0,08
B04	Baardmeesweg 1	5	0,03	0,03	0,04	0,04
B05	Baardmeesweg 13	5	0,01	0,01	0,00	0,00
B07	Baardmeesweg 3	5	0,04	0,04	0,05	0,05
B59	Schollevaarweg 1	5	0,03	0,03	0,05	0,05
B62	Schollevaarweg 5	5	0,03	0,03	0,04	0,04
B63	Schollevaarweg 6	5	0,00	0,00	0,01	0,01

Bijlage 2 – in en uitvoergegevens slagschaduw

Project:
715027 SS

Licensed user:
Pondera Consult B.V.
Welbergweg 49
NL-7556 PE Hengelo
0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
14-11-2016 11:05/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - schuiven SCH06 en SCH09 - 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

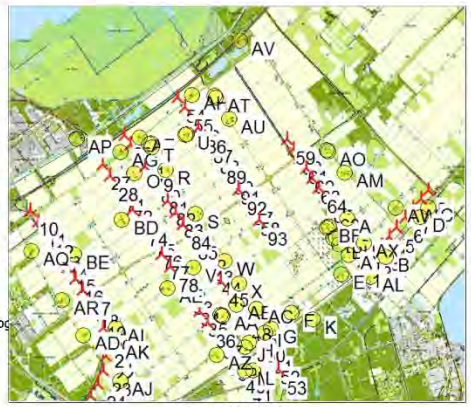
Operational time

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.wpc
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 [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	163.907	487.598	-5,6	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	164.805	488.588	-4,9	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...

SHADOW - Main Result

Calculation: SS VKA hoog - schuiven SCH06 en SCH09 - referentiewoningen

...continued from previous page

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[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]	[°]	[°]	
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...

SHADOW - Main Result

Calculation: SS VKA hoog - schuiven SCH06 en SCH09 - referentiewoningen

...continued from previous page

No.	X (east)	Y (north)	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction 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"

SHADOW - Main Result

Calculation: SS VKA hoog - schuiven SCH06 en SCH09 - referentiewoningen

Calculation Results

Shadow receptor

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

SHADOW - Main Result

Calculation: SS VKA hoog - schuiven SCH06 en SCH09 - 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) (1535)	74:09	15:49
2	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1536)	167:07	31:59
3	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1537)	26:05	5:58
4	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1538)	10:03	2:34
5	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1539)	8:44	1:50
6	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1540)	105:53	19:40
7	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1541)	59:19	13:50
8	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1542)	10:28	2:43
9	VESTAS V110-2.0 2000 110.0 !O! hub: 105,0 m (TOT: 160,0 m) (1543)	0:00	0:00
10	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1544)	0:00	0:00
11	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1545)	0:00	0:00
12	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1546)	0:10	0:02
13	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1547)	97:34	23:19
14	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1548)	85:36	20:07
15	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1549)	122:54	20:32
16	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1550)	1:44	0:14
17	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1551)	47:29	12:24
18	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1552)	13:48	3:01
19	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1553)	5:46	1:03
20	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1554)	161:06	40:06
21	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1555)	194:37	38:37
22	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1556)	112:01	19:29
23	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1557)	39:45	7:48
24	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1558)	24:43	5:30
25	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1559)	10:05	2:06
26	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1560)	29:19	7:00
27	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1561)	55:18	10:36
28	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1562)	52:31	9:17
29	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1563)	144:14	33:21
30	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1564)	170:43	39:12
31	ENERCON E-141 EP4 4200 141.0 !-! hub: 149,5 m (TOT: 220,0 m) (1565)	257:09	51:05
32	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1566)	29:18	5:55
33	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1567)	30:08	6:46
34	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1568)	20:53	4:21
35	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1569)	30:33	6:58
36	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1570)	66:10	13:58
37	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1571)	58:48	9:02
38	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1572)	21:25	4:54
39	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1573)	123:06	27:53
40	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1574)	201:25	44:54
41	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1575)	423:42	75:54
42	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1576)	13:51	3:09
43	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1577)	38:40	9:27
44	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1578)	91:35	19:06
45	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1579)	31:47	7:20
46	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1580)	66:38	13:43
47	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1581)	27:19	6:32
48	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1582)	203:44	34:31
49	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1583)	155:13	30:10
50	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1584)	169:36	38:53
51	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1585)	90:30	16:14
52	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1586)	50:19	11:20
53	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1587)	13:38	2:51
54	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1588)	47:43	10:44
55	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1589)	107:51	17:06
56	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1590)	11:40	1:59
57	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1591)	0:00	0:00
58	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1592)	0:00	0:00
59	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1593)	0:37	0:08
60	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1594)	4:00	0:54
61	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1595)	9:18	1:56
62	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1596)	17:13	3:03
63	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1597)	4:04	0:48
64	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1598)	6:01	1:15
65	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1599)	15:01	2:13

To be continued on next page...

SHADOW - Main Result

Calculation: SS VKA hoog - schuiven SCH06 en SCH09 - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
66	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1600)	9:52	2:11
67	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1601)	173:05	39:46
68	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1602)	281:28	51:25
69	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1603)	160:06	36:18
70	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1604)	247:39	55:32
71	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1605)	16:59	3:11
72	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1606)	0:00	0:00
73	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1607)	0:00	0:00
74	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1608)	22:56	5:09
75	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1609)	5:56	1:03
76	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1610)	0:00	0:00
77	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1611)	2:45	0:37
78	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1612)	10:58	2:32
79	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1613)	46:47	11:26
80	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1614)	58:04	12:03
81	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1615)	4:22	0:51
82	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1616)	6:41	1:31
83	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1617)	17:24	4:07
84	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1618)	40:48	7:47
85	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1619)	0:00	0:00
86	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1620)	63:45	16:38
87	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1621)	30:55	6:06
88	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1622)	8:37	1:31
89	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1623)	0:00	0:00
90	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1624)	0:00	0:00
91	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1625)	0:00	0:00
92	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1626)	0:00	0:00
93	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1627)	0:00	0:00

BIJLAGE 3D

EFFECT SLAGSCHADUW VERGROTING ROTORDIAMETER

WP ZEEWOLDE - EFFECT SLAGSCHADUW VERGROTING ROTORDIAMETER

Datum	1-12-2016
Van	D.F. Oude Lansink, Pondera Consult
Betreft	WP Zeewolde, effect slagschaduw door vergroting rotordiameter
Projectnummer	716034

Inleiding

In het kader van de Windpark Zeewolde zijn akoestische berekeningen en berekeningen aan slagschaduwduur gedaan. De uitgangspunten en resultaten van deze berekeningen zijn vastgelegd in rapporten voor vergunning en ten behoeve van het MER:

- “Onderzoek Akoestiek en Slagschaduw vergunning Windpark Zeewolde”, d.d. 29 november 2016 met projectnummer 716034, opgesteld door Pondera Consult.
- “Onderzoek Akoestiek en Slagschaduw Windpark Zeewolde”, d.d. 1 december 2016 met projectnummer 716034, opgesteld door Pondera Consult.

De huidige memo betreft de effecten op slagschaduw door een kleine toename van de rotordiameter voor de 22 turbines met maximale tiphoogte van 220 meter, te weten turbines A27-01 t/m A27-17, ADO01, ADO02, AD03, ADW01 en ADW02. De rotordiameter van deze turbines wordt vergroot van 141 naar 142 meter. De maximale tiphoogte blijft 220 meter, dus de ashoogte is dan maximaal 149 meter in plaats van 149,5 meter.

Deze toename in rotordiameter betekent niet dat er luidere turbines worden aangevraagd dan tot nu toe aangenomen, er zal dus op geluid geen effect zijn. Voor wat betreft slagschaduw worden de effecten van de diametervergroting in het navolgende bepaald.

Omschrijving berekeningen

De berekeningen zijn uitgevoerd met dezelfde rekenmodellen als die, welke zijn gebruikt voor het bovengenoemde rapporten. Voor deze berekening zijn enkel de turbines A27-01 t/m A27-17, ADO01, ADO02, AD03, ADW01 en ADW02 ingevoerd met een rotordiameter van 142 meter in plaats van 141 meter. De rekenresultaten zijn weergegeven in de bijlagen hieronder.

Bespreking resultaten

Uit de rekenresultaten (zie tabel 1) blijkt dat het effect van de diametervergroting voor slagschaduw zeer klein is. Het effect is beperkt tot 16 van de 60 referentiepunten. De toename bedraagt maximaal 2,4% van de oorspronkelijke tijden. De wijzigingen van de contouren is minimaal, in bijlage 2 worden de contouren weergegeven.

Tabel 1 Schaduw windpark Zeewolde verwachte hinderduur op referentietoetspunten (uu:mm, uren en minuten)

ref	omschrijving	max diameter 141 meter	max diameter 142 meter	toename	toename procentueel
14	Dodaarsweg 1	21:47	22:06	0:19	1,5%
15	Dodaarsweg 10	21:34	21:37	0:03	0,2%
17	Dodaarsweg 2	29:10	29:32	0:22	1,3%
18	Dodaarsweg 30	18:54	18:56	0:02	0,2%
20	Dodaarsweg 6	27:23	27:44	0:21	1,3%
30	Goudplevierweg 5	23:15	23:28	0:13	0,9%
32	Ibisweg 10	52:04	52:42	0:38	1,2%
33	Ibisweg 14	22:53	23:07	0:14	1,0%
35	Kluutweg 10	36:31	37:05	0:34	1,6%
36	Kluutweg 3	13:38	13:53	0:15	1,8%
37	Kluutweg 7	41:41	42:41	1:00	2,4%
42	M. Mousestraat 49	1:43	1:44	0:01	1,0%
43	Paradijsvogelweg 12	15:24	15:32	0:08	0,9%
44	Paradijsvogelweg 2	16:26	16:35	0:09	0,9%
55	Tureluurweg 55	7:00	7:04	0:04	1,0%
57	Wulpweg 22	49:45	50:20	0:35	1,2%

Bijlage 1 – in en uitvoergegevens slagschaduw

Project:
715027 SS

Licensed user:
Pondera Consult B.V.
Welbergweg 49
NL-7556 PE Hengelo
0031742489940
Dion Oude Lansink / d.oudelansink@ponderaconsult.com
Calculated:
27-11-2016 13:10/3.0.654

SHADOW - Main Result

Calculation: SS VKA hoog - max diameter 142 meter - 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.wpg
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	Row data/Description	Valid	WTG type Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	162.302	486.013	-6,0	VESTAS V110-2.0 2000 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	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 ...	Yes	VESTAS	V110-2.0-2.000	2.000	110,0	105,0	1.320	0,0
10	155.151	485.420	-5,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
11	155.434	485.021	-6,9	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
12	155.718	484.621	-6,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
13	156.001	484.222	-5,8	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
14	156.284	483.823	-6,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
15	156.567	483.423	-5,8	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
16	156.851	483.024	-5,9	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
17	157.134	482.625	-6,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
18	157.449	482.181	-6,4	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
19	157.701	481.826	-5,2	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
20	155.938	486.533	-6,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
21	156.230	486.119	-5,8	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
22	156.512	485.717	-5,6	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
23	156.805	485.301	-6,3	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
24	157.088	484.899	-6,8	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
25	157.370	484.498	-5,9	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
26	157.676	484.064	-6,3	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
27	157.939	483.690	-5,4	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
28	158.213	483.301	-5,8	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
29	158.505	482.886	-2,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
30	158.769	482.512	-5,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
31	159.035	482.134	-5,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
32	155.156	491.925	-6,1	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
33	155.415	491.556	-4,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
34	155.675	491.188	-5,5	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
35	157.753	488.241	-5,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
36	158.013	487.873	-5,6	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
37	159.358	490.411	-5,9	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5

To be continued on next page...

SHADOW - Main Result

Calculation: SS VKA hoog - max diameter 142 meter - referentiewoningen

...continued from previous page

					WTG type						Shadow data	
	X (east)	Y (north)	Z [m]	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM [RPM]
38	159.603	490.063	-5,9	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
39	159.847	489.715	-5,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
40	160.091	489.367	-5,6	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
41	160.335	489.020	-5,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
42	160.579	488.672	-5,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
43	160.823	488.324	-5,8	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
44	161.067	487.976	-6,6	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
45	161.311	487.629	-5,0	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
46	161.556	487.281	-6,7	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
47	161.800	486.933	-5,8	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
48	162.044	486.585	-5,5	Acciona Windpower AW...	Yes	Acciona Windpower	AW132/3000-3.000	3.000	132,0	94,0	1.584	12,5
49	152.823	488.700	-6,4	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
50	153.110	488.295	-6,1	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
51	153.397	487.891	-6,0	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
52	153.684	487.487	-6,3	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
53	153.971	487.083	-5,7	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
54	154.258	486.678	-6,4	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
55	154.545	486.274	-6,0	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
56	154.868	485.819	-6,0	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
57	153.896	489.434	-6,8	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
58	154.183	489.026	-7,0	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
59	154.482	488.601	-7,0	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
60	154.771	488.190	-6,4	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
61	155.058	487.783	-6,5	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
62	155.359	487.355	-6,6	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
63	155.608	487.001	-6,0	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
64	155.935	490.820	-4,7	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
65	156.195	490.451	-6,5	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
66	156.454	490.083	-4,6	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
67	156.714	489.715	-6,0	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
68	156.974	489.346	-6,0	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
69	157.234	488.978	-6,0	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
70	157.494	488.609	-5,0	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
71	158.273	487.504	-5,8	Siemens SWT-3.6-120 ...	Yes	Siemens	SWT-3.6-120-3.600	3.600	120,0	90,0	1.440	14,0
72	149.490	487.866	-6,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
73	149.775	487.456	-6,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
74	150.061	487.046	-6,4	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
75	150.347	486.635	-6,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
76	150.633	486.225	-5,6	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
80	151.810	484.553	-6,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
81	152.083	484.110	-6,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
82	152.278	483.628	-5,1	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
83	152.379	483.118	-5,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
84	152.379	482.599	-4,4	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
85	152.272	482.090	-7,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
86	152.066	481.612	-4,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
87	151.789	481.172	-3,2	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
88	151.478	480.759	-5,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
89	152.250	489.508	-6,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
90	152.536	489.104	-6,8	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
91	153.104	490.559	-6,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
92	153.336	490.229	-6,6	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
93	153.598	489.857	-5,7	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
A	151.203	485.404	-6,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
A+1	150.918	485.814	-6,0	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0
A-1	151.489	484.993	-5,2	Pondera Dia 142 4000 ...	Yes	Pondera	Dia 142-4.000	4.000	142,0	149,0	1.704	0,0

SHADOW - Main Result

Calculation: SS VKA hoog - max diameter 142 meter - 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]	[°]	[°]	
1	161.687	487.553	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
2	163.152	486.177	-4,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
3	164.807	487.957	-3,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
4	164.490	487.612	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
5	161.462	485.549	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
6	159.541	484.168	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
7	158.737	483.596	-6,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
8	157.897	483.083	-5,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
9	158.521	483.446	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
10	157.750	482.908	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
11	160.348	483.925	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
12	158.055	482.089	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
13	157.747	482.056	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
14	154.137	490.253	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
15	153.487	489.162	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
16	155.502	490.588	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
17	154.052	490.227	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
18	154.686	489.294	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
19	155.829	487.713	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
20	154.137	490.115	-5,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
21	155.444	490.550	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
22	155.747	485.777	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
23	156.955	486.027	-5,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
24	157.532	485.206	-5,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
25	156.798	484.093	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
26	156.845	484.034	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
27	156.886	484.074	-5,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
28	157.411	484.442	-4,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
29	158.192	484.312	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
30	151.516	483.347	-3,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
31	154.764	485.049	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
32	153.680	490.471	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
33	152.962	489.931	-4,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
34	155.704	491.986	-3,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
35	152.775	483.610	-5,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
36	152.940	481.700	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
37	152.687	483.019	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
38	162.574	485.454	-2,9	8,0	4,5	0,5	0,0	90,0	"Green house mode"
39	161.572	489.195	-2,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
40	160.894	490.024	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
41	160.935	489.969	-2,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
42	151.274	490.426	-6,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
43	149.533	486.385	-2,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
44	150.703	484.610	-2,7	8,0	4,5	0,5	0,0	90,0	"Green house mode"
45	156.585	491.966	-4,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
46	156.619	491.901	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
47	157.147	491.122	-3,6	8,0	4,5	0,5	0,0	90,0	"Green house mode"
48	157.533	493.945	-3,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
49	163.540	487.928	-4,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
50	162.319	486.673	-3,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
51	161.740	486.253	-4,1	8,0	4,5	0,5	0,0	90,0	"Green house mode"
52	156.646	482.632	-4,4	8,0	4,5	0,5	0,0	90,0	"Green house mode"
53	161.252	486.851	-4,2	8,0	4,5	0,5	0,0	90,0	"Green house mode"
54	160.957	487.267	-5,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
55	152.319	480.720	-4,8	8,0	4,5	0,5	0,0	90,0	"Green house mode"
56	152.990	487.508	-6,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
57	151.155	486.267	-6,0	8,0	4,5	0,5	0,0	90,0	"Green house mode"
58	160.882	487.229	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"
59	161.154	486.841	-5,3	8,0	4,5	0,5	0,0	90,0	"Green house mode"
60	161.366	486.618	-4,5	8,0	4,5	0,5	0,0	90,0	"Green house mode"

SHADOW - Main Result

Calculation: SS VKA hoog - max diameter 142 meter - referentiewoningen

Calculation Results

Shadow receptor

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
1	424:23	296	2:04	84:51
2	109:55	168	1:15	24:58
3	42:23	93	0:45	9:40
4	45:05	95	0:47	10:23
5	25:05	70	0:29	6:34
6	0:00	0	0:00	0:00
7	74:54	183	0:54	16:27
8	100:45	220	0:52	21:11
9	238:11	270	1:32	51:09
10	84:23	196	1:08	18:11
11	0:00	0	0:00	0:00
12	185:24	262	1:14	41:26
13	495:15	297	2:15	96:18
14	99:48	185	0:52	22:06
15	97:41	224	0:55	21:37
16	87:43	161	1:01	21:06
17	132:22	215	0:58	29:32
18	85:08	191	0:52	18:56
19	64:53	159	0:51	13:36
20	121:31	217	0:56	27:44
21	71:09	152	0:52	17:13
22	80:16	191	0:58	17:38
23	97:47	203	1:01	21:14
24	97:36	206	1:01	21:14
25	108:53	268	1:07	23:43
26	122:59	267	1:13	25:04
27	105:15	240	1:10	21:26
28	139:14	138	1:28	19:16
29	98:35	227	0:56	20:05
30	106:44	203	0:45	23:28
31	40:08	109	0:46	8:29
32	251:12	300	1:17	52:42
33	115:55	186	1:02	23:07
34	148:37	177	1:06	26:45
35	171:09	228	1:08	37:05
36	62:49	138	0:39	13:53
37	211:39	223	1:32	42:41
38	0:00	0	0:00	0:00
39	25:13	123	0:24	4:25
40	20:53	101	0:27	3:59
41	18:03	92	0:26	3:32
42	13:31	47	0:27	1:44
43	65:21	155	0:42	15:32
44	67:37	144	0:43	16:35
45	12:03	71	0:20	2:12
46	10:37	66	0:20	2:00
47	7:52	59	0:17	1:32
48	0:00	0	0:00	0:00
49	96:52	181	0:56	18:05
50	352:56	345	2:25	74:12
51	44:21	114	0:44	8:52
52	84:20	154	1:05	18:39
53	74:46	132	0:59	17:30
54	58:33	133	0:54	12:52
55	29:36	56	0:41	7:04
56	28:52	80	0:41	6:12
57	246:11	302	1:09	50:20
58	44:32	119	0:46	9:59
59	49:21	108	0:49	11:29
60	46:10	130	0:46	10:18

SHADOW - Main Result

Calculation: SS VKA hoog - max diameter 142 meter - 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	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1446)	29:18	5:55
11	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1447)	30:08	6:46
12	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1448)	20:53	4:21
13	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1449)	30:33	6:58
14	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1450)	66:10	13:58
15	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1451)	58:48	9:02
16	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1452)	21:25	4:54
17	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1453)	123:06	27:53
18	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1454)	201:25	44:54
19	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1455)	423:42	75:54
20	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1456)	13:51	3:09
21	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1457)	38:40	9:27
22	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1458)	91:35	19:06
23	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1459)	31:47	7:20
24	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1460)	66:38	13:43
25	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1461)	27:19	6:32
26	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1462)	203:44	34:31
27	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1463)	155:13	30:10
28	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1464)	169:36	38:53
29	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1465)	90:30	16:14
30	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1466)	50:19	11:20
31	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1467)	13:38	2:51
32	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1468)	47:43	10:44
33	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1469)	107:51	17:06
34	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1470)	11:40	1:59
35	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1471)	0:00	0:00
36	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1472)	0:00	0:00
37	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1473)	0:37	0:08
38	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1474)	4:00	0:54
39	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1475)	9:18	1:56
40	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1476)	17:13	3:03
41	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1477)	4:04	0:48
42	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1478)	6:01	1:15
43	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1479)	15:01	2:13
44	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1480)	9:52	2:11
45	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1481)	173:05	39:46
46	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1482)	281:28	51:25
47	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1483)	160:06	36:18
48	Acciona Windpower AW132/3000 3000 132.0 !O! hub: 94,0 m (TOT: 160,0 m) (1484)	247:39	55:32
49	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1485)	16:59	3:11
50	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1486)	0:00	0:00
51	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1487)	0:00	0:00
52	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1488)	22:56	5:09
53	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1489)	5:56	1:03
54	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1490)	0:00	0:00
55	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1491)	2:45	0:37
56	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1492)	10:58	2:32
57	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1493)	46:47	11:26
58	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1494)	58:04	12:04
59	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1495)	4:22	0:51
60	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1496)	6:41	1:31
61	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1497)	17:24	4:07
62	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1498)	40:48	7:47
63	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1499)	0:00	0:00
64	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1500)	63:45	16:38
65	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1501)	30:55	6:06

To be continued on next page...

SHADOW - Main Result

Calculation: SS VKA hoog - max diameter 142 meter - referentiewoningen

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
66	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1502)	8:37	1:31
67	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1503)	0:00	0:00
68	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1504)	0:00	0:00
69	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1505)	0:00	0:00
70	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1506)	0:00	0:00
71	Siemens SWT-3.6-120 3600 120.0 !O! hub: 90,0 m (TOT: 150,0 m) (1507)	0:00	0:00
72	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1628)	0:00	0:00
73	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1629)	0:00	0:00
74	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1630)	0:10	0:02
75	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1631)	98:20	23:30
76	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1632)	86:49	20:23
80	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1636)	13:53	3:02
81	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1637)	5:47	1:03
82	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1638)	163:01	40:34
83	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1639)	199:25	39:33
84	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1640)	114:13	19:50
85	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1641)	40:40	8:01
86	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1642)	24:50	5:32
87	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1643)	10:12	2:08
88	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1644)	29:36	7:04
89	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1645)	55:42	10:41
90	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1646)	52:55	9:22
91	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1647)	145:14	33:35
92	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1648)	173:16	39:45
93	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1649)	259:44	51:35
A	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1634)	1:44	0:14
A+1	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1633)	124:29	20:47
A-1	Pondera Dia 142 4000 142.0 !O! hub: 149,0 m (TOT: 220,0 m) (1635)	47:57	12:32

Bijlage 2 –slagschaduwcontouren – max. rotordiameter 142 meter