

SHADOW - Main Result

Calculation: Analiza migotania cienia - wariant proponowany H = 143m

Assumptions for shadow calculations

Maximum distance for influence
 Calculate only when more than 20 % of sun is covered by the blade
 Please look in WTG table

Minimum sun height over horizon for influence 3 °
 Day step for calculation 1 days
 Time step for calculation 1 minutes
 The calculated times are "worst case" given by the following assumptions:
 The sun is shining all the day, from sunrise to sunset
 The rotor plane is always perpendicular to the line from the WTG to the sun
 The WTG is always operating

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: Height Contours: CONTOURLINE_ONLINEDATA_0.wpo
 Obstacles used in calculation
 Eye height: 1,5 m
 Grid resolution: 10,0 m
 Topographic shadow included in calculation

All coordinates are in
 Geo [deg,min,sec]-WGS84

WTGs

	Longitude	Latitude	Z	Row data/Description	WTG type			Shadow data				
					Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM [RPM]
1	20°27'56,79" E	51°03'55,26" N	254,7	EW3	Yes	ENERCON	E-126-7 500	7 500	127,0	143,0	2 943	12,0
2	20°27'39,07" E	51°03'43,63" N	253,8	EW2	Yes	ENERCON	E-126-7 500	7 500	127,0	143,0	2 943	12,0
3	20°27'15,07" E	51°03'49,15" N	254,8	EW1	Yes	ENERCON	E-126-7 500	7 500	127,0	143,0	2 943	12,0



▲ New WTG

● Shadow receptor

Shadow receptor-Input

No.	Name	Longitude	Latitude	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
A	SH1	20°26'49,17" E	51°03'49,38" N	254,7	1,0	1,0	1,0	0,0	90,0	"Green house mode"
B	SH2	20°27'31,17" E	51°03'24,60" N	250,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
C	SH3	20°27'43,20" E	51°03'24,65" N	254,4	1,0	1,0	1,0	0,0	90,0	"Green house mode"
D	SH4	20°27'52,03" E	51°03'25,19" N	255,6	1,0	1,0	1,0	0,0	90,0	"Green house mode"
E	SH5	20°26'38,30" E	51°03'42,95" N	252,5	1,0	1,0	1,0	0,0	90,0	"Green house mode"
F	SH5	20°27'30,63" E	51°04'18,35" N	279,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

Shadow, worst case

No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
A	SH1	84:51	121	1:18
B	SH2	0:00	0	0:00
C	SH3	0:00	0	0:00
D	SH4	0:00	0	0:00
E	SH5	59:58	133	0:41
F	SH5	32:03	62	0:37

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	EW3	48:03	
2	EW2	24:57	
3	EW1	105:22	

SHADOW - Calendar

Calculation: Analiza migotania cienia - wariant proponowany H = 143m **Shadow receptor:** A - SH1

Assumptions for shadow calculations

Reference year for calendar 2013

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June
1	07:41 15:40	07:16 16:26	06:24 17:16	06:15 19:08	05:12 19:57	06:52 (3) 07:41 (3)
2	07:41 15:41	07:14 16:28	06:22 17:18	06:13 19:10	07:18 (3) 05:11 19:59	06:52 (3) 07:39 (3)
3	07:40 15:42	07:13 16:30	06:20 17:19	06:11 19:11	07:13 (3) 05:09 22 07:35 (3)	06:53 (3) 07:38 (3)
4	07:40 15:43	07:11 16:31	06:18 17:21	06:09 19:13	07:10 (3) 05:07 29 07:39 (3)	06:54 (3) 07:37 (3)
5	07:40 15:44	07:09 16:33	06:16 17:23	06:06 19:15	07:07 (3) 05:05 33 07:40 (3)	06:55 (3) 07:36 (3)
6	07:40 15:45	07:08 16:35	06:13 17:25	06:04 19:16	07:05 (3) 05:03 37 07:42 (3)	06:55 (3) 07:34 (3)
7	07:39 15:47	07:06 16:37	06:11 17:26	06:02 19:18	07:03 (3) 05:02 40 07:43 (3)	06:57 (3) 07:33 (3)
8	07:39 15:48	07:04 16:38	06:09 17:28	06:00 19:19	06:27 (1) 05:00 51 07:44 (3)	06:58 (3) 07:31 (3)
9	07:39 15:49	07:03 16:40	06:07 17:30	05:58 19:21	06:24 (1) 04:58 59 07:45 (3)	07:00 (3) 07:30 (3)
10	07:38 15:50	07:01 16:42	06:05 17:31	05:55 19:23	06:21 (1) 04:57 64 07:45 (3)	07:01 (3) 07:28 (3)
11	07:38 15:52	06:59 16:44	06:02 17:33	05:53 19:24	06:20 (1) 04:55 68 07:46 (3)	07:03 (3) 07:26 (3)
12	07:37 15:53	06:57 16:46	06:00 17:35	06:34 (2) 05:51 13 06:47 (2)	05:51 19:26 72 07:47 (3)	07:05 (3) 07:23 (3)
13	07:36 15:55	06:56 16:48	05:58 17:36	06:31 (2) 05:49 18 06:49 (2)	05:49 19:28 73 07:47 (3)	07:09 (3) 07:19 (3)
14	07:36 15:56	06:54 16:49	05:56 17:38	06:29 (2) 05:47 22 06:51 (2)	05:47 19:29 76 07:48 (3)	04:22 20:52
15	07:35 15:58	06:52 16:51	05:54 17:40	06:28 (2) 05:45 24 06:52 (2)	05:45 19:31 77 07:48 (3)	04:22 20:53
16	07:34 15:59	06:50 16:53	05:51 17:41	06:26 (2) 05:43 26 06:52 (2)	05:43 19:33 77 07:48 (3)	04:22 20:53
17	07:33 16:01	06:48 16:55	05:49 17:43	06:25 (2) 05:40 28 06:53 (2)	05:40 19:34 77 07:48 (3)	04:22 20:54
18	07:32 16:02	06:46 16:56	05:47 17:45	06:25 (2) 05:38 28 06:53 (2)	05:38 19:36 77 07:48 (3)	04:22 20:54
19	07:31 16:04	06:44 16:58	05:45 17:46	06:25 (2) 05:36 29 06:54 (2)	05:36 19:38 76 07:48 (3)	04:22 20:55
20	07:31 16:05	06:42 17:00	05:42 17:48	06:23 (2) 05:34 30 06:53 (2)	05:34 19:39 74 07:48 (3)	04:22 20:55
21	07:29 16:07	06:40 17:02	05:40 17:50	06:23 (2) 05:32 30 06:53 (2)	05:32 19:41 70 07:47 (3)	04:22 20:55
22	07:28 16:09	06:38 17:04	05:38 17:51	06:23 (2) 05:30 29 06:52 (2)	05:30 19:42 66 07:47 (3)	04:22 20:55
23	07:27 16:10	06:36 17:05	05:36 17:53	06:23 (2) 05:28 28 06:51 (2)	05:28 19:44 56 07:46 (3)	04:22 20:56
24	07:26 16:12	06:34 17:07	05:33 17:55	06:23 (2) 05:26 27 06:50 (2)	05:26 19:46 56 07:46 (3)	04:22 20:56
25	07:25 16:14	06:32 17:09	05:31 17:56	06:24 (2) 05:24 25 06:49 (2)	05:24 19:47 55 07:45 (3)	04:23 20:56
26	07:24 16:15	06:30 17:11	05:29 17:58	06:25 (2) 05:22 23 06:48 (2)	05:22 19:49 54 07:44 (3)	04:23 20:56
27	07:22 16:17	06:28 17:12	05:27 18:00	06:25 (2) 05:20 21 06:46 (2)	05:20 19:51 54 07:44 (3)	04:24 20:56
28	07:21 16:19	06:26 17:14	05:24 18:01	06:27 (2) 05:18 17 06:44 (2)	05:18 19:52 53 07:43 (3)	04:24 20:56
29	07:20 16:21		05:22 18:03	06:30 (2) 05:16 11 06:41 (2)	05:16 19:54 51 07:42 (3)	04:24 20:56
30	07:18 16:22		05:20 18:05	05:14 19:55	05:14 20:39 50 07:42 (3)	04:25 20:55
31	07:17 16:24		06:18 19:06		04:29 20:40	
Potential sun hours	262	279	367	414	481	494
Total, worst case			429	1660	441	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Analiza migotania cienia - wariant proponowany H = 143m **Shadow receptor:** A - SH1

Assumptions for shadow calculations

Reference year for calendar

2013

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	July	August	September	October	November	December	
1	04:26	05:01	07:15 (3) 05:48	06:20 (1) 06:35	07:11 (2) 06:27	07:17	
	20:55	20:25	18 07:33 (3) 19:25	69 07:46 (3) 18:17	18 07:29 (2) 16:13	15:34	
2	04:26	05:02	07:13 (3) 05:50	06:20 (1) 06:37	07:13 (2) 06:29	07:18	
	20:55	20:24	23 07:36 (3) 19:23	66 07:45 (3) 18:15	12 07:25 (2) 16:11	15:34	
3	04:27	05:04	07:11 (3) 05:51	06:21 (1) 06:39		06:31 07:19	
	20:55	20:22	27 07:38 (3) 19:21	62 07:44 (3) 18:13		16:10 15:33	
4	04:28	05:05	07:10 (3) 05:53	06:22 (1) 06:40		06:33 07:21	
	20:54	20:20	30 07:40 (3) 19:19	55 07:42 (3) 18:11		16:08 15:32	
5	04:28	05:07	07:08 (3) 05:55	06:59 (3) 06:42		06:34 07:22	
	20:54	20:19	33 07:41 (3) 19:16	42 07:41 (3) 18:09		16:06 15:32	
6	04:29	05:08	07:06 (3) 05:56	07:00 (3) 06:44		06:36 07:23	
	20:53	20:17	36 07:42 (3) 19:14	38 07:38 (3) 18:06		16:04 15:31	
7	04:30	05:10	07:05 (3) 05:58	07:02 (3) 06:45		06:38 07:25	
	20:53	20:15	39 07:44 (3) 19:12	35 07:37 (3) 18:04		16:03 15:31	
8	04:31	05:11	07:04 (3) 05:59	07:03 (3) 06:47		06:39 07:26	
	20:52	20:13	41 07:45 (3) 19:10	31 07:34 (3) 18:02		16:01 15:31	
9	04:32	05:13	07:03 (3) 06:01	07:06 (3) 06:48		06:41 07:27	
	20:52	20:12	44 07:47 (3) 19:07	25 07:31 (3) 18:00		16:00 15:31	
10	04:33	05:14	07:02 (3) 06:02	07:08 (3) 06:50		06:43 07:28	
	20:51	20:10	45 07:47 (3) 19:05	19 07:27 (3) 17:58		15:58 15:30	
11	04:34	05:16	07:02 (3) 06:04		06:52	06:45 07:29	
	20:50	20:08	46 07:48 (3) 19:03		17:55	15:57 15:30	
12	04:35	05:17	07:00 (3) 06:06		06:53	06:46 07:30	
	20:49	20:06	49 07:49 (3) 19:01		17:53	15:55 15:30	
13	04:36	05:19	07:00 (3) 06:07		06:55	06:48 07:31	
	20:49	20:04	50 07:50 (3) 18:58		17:51	15:54 15:30	
14	04:37	05:20	06:59 (3) 06:09	07:24 (2) 06:57		06:50 07:32	
	20:48	20:02	51 07:50 (3) 18:56	3 07:27 (2) 17:49		15:52 15:30	
15	04:38	05:22	06:58 (3) 06:10	07:19 (2) 06:58		06:51 07:33	
	20:47	20:00	52 07:50 (3) 18:54	13 07:32 (2) 17:47		15:51 15:30	
16	04:39	05:23	06:58 (3) 06:12	07:16 (2) 07:00		06:53 07:34	
	20:46	19:58	53 07:51 (3) 18:52	18 07:34 (2) 17:45		15:49 15:30	
17	04:40	05:25	06:57 (3) 06:13	07:14 (2) 07:02		06:55 07:35	
	20:45	19:56	54 07:51 (3) 18:49	22 07:36 (2) 17:43		15:48 15:30	
18	04:42	05:26	06:57 (3) 06:15	07:12 (2) 07:03		06:56 07:35	
	20:44	19:54	54 07:51 (3) 18:47	24 07:36 (2) 17:40		15:47 15:31	
19	04:43	05:28	06:56 (3) 06:17	07:11 (2) 07:05		06:58 07:36	
	20:43	19:52	55 07:51 (3) 18:45	26 07:37 (2) 17:38		15:46 15:31	
20	04:44	05:30	06:56 (3) 06:18	07:09 (2) 07:07		07:00 07:37	
	20:42	19:50	56 07:52 (3) 18:42	28 07:37 (2) 17:36		15:44 15:31	
21	04:45	05:31	06:28 (1) 06:20	07:09 (2) 07:08		07:01 07:37	
	20:40	19:48	64 07:51 (3) 18:40	28 07:37 (2) 17:34		15:43 15:32	
22	04:47	05:33	06:25 (1) 06:21	07:09 (2) 07:10		07:03 07:38	
	20:39	19:46	71 07:52 (3) 18:38	29 07:38 (2) 17:32		15:42 15:32	
23	04:48	05:34	06:23 (1) 06:23	07:08 (2) 07:12		07:05 07:38	
	20:38	19:44	73 07:51 (3) 18:36	29 07:37 (2) 17:30		15:41 15:33	
24	04:49	05:36	06:22 (1) 06:24	07:08 (2) 07:14		07:06 07:39	
	20:37	19:42	75 07:51 (3) 18:33	29 07:37 (2) 17:28		15:40 15:33	
25	04:51	05:37	06:21 (1) 06:26	07:07 (2) 07:15		07:08 07:39	
	20:35	19:40	77 07:51 (3) 18:31	29 07:36 (2) 17:26		15:39 15:34	
26	04:52	05:39	06:20 (1) 06:28	07:07 (2) 07:17		07:09 07:40	
	20:34	19:38	78 07:51 (3) 18:29	29 07:36 (2) 17:24		15:38 15:34	
27	04:53	05:41	06:19 (1) 06:29	07:07 (2) 06:19		07:11 07:40	
	20:33	19:36	78 07:50 (3) 18:27	27 07:34 (2) 16:22		15:37 15:35	
28	04:55	05:42	06:19 (1) 06:31	07:08 (2) 06:20		07:12 07:40	
	20:31	19:34	78 07:50 (3) 18:24	26 07:34 (2) 16:21		15:36 15:36	
29	04:56	05:44	06:19 (1) 06:32	07:09 (2) 06:22		07:14 07:40	
	20:30	19:32	76 07:48 (3) 18:22	24 07:33 (2) 16:19		15:36 15:37	
30	04:58	05:45	06:19 (1) 06:34	07:09 (2) 06:24		07:15 07:40	
	20:28	19:29	75 07:48 (3) 18:20	21 07:30 (2) 16:17		15:35 15:38	
31	04:59	05:47	06:19 (1)		06:26		07:41
	20:27	10 07:19 (3) 07:29 (3) 19:27	73 07:47 (3)		16:15		15:39
Potential sun hours	498	452	381	333	270	248	
Total, worst case	10	1674	847	30			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Analiza migotania cienia - wariant proponowany H = 143m **Shadow receptor:** B - SH2

Assumptions for shadow calculations

Reference year for calendar 2013

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:40	07:15 16:26	06:24 17:16	06:15 19:08	05:12 19:57	04:29 20:41	04:26 20:55	05:01 20:25	05:48 19:25	06:35 18:17	06:27 16:13	07:17 15:34
2	07:40 15:41	07:14 16:28	06:22 17:18	06:13 19:10	05:10 19:59	04:28 20:42	04:26 20:55	05:02 20:23	05:50 19:23	06:37 18:15	06:29 16:11	07:18 15:33
3	07:40 15:42	07:12 16:29	06:20 17:19	06:11 19:11	05:09 20:00	04:27 20:43	04:27 20:55	05:03 20:22	05:51 19:21	06:39 18:13	06:31 16:10	07:19 15:33
4	07:40 15:43	07:11 16:31	06:18 17:21	06:09 19:13	05:07 20:02	04:26 20:44	04:28 20:54	05:05 20:20	05:53 19:18	06:40 18:11	06:32 16:08	07:21 15:32
5	07:40 15:44	07:09 16:33	06:15 17:23	06:06 19:14	05:05 20:03	04:26 20:45	04:28 20:54	05:06 20:18	05:55 19:16	06:42 18:09	06:34 16:06	07:22 15:32
6	07:40 15:45	07:08 16:35	06:13 17:24	06:04 19:16	05:03 20:05	04:25 20:46	04:29 20:53	05:08 20:17	05:56 19:14	06:43 18:06	06:36 16:04	07:23 15:31
7	07:39 15:47	07:06 16:37	06:11 17:26	06:02 19:18	05:02 20:07	04:24 20:47	04:30 20:53	05:10 20:15	05:58 19:12	06:45 18:04	06:38 16:03	07:24 15:31
8	07:39 15:48	07:04 16:38	06:09 17:28	06:00 19:19	05:00 20:08	04:24 20:48	04:31 20:52	05:11 20:13	05:59 19:10	06:47 18:02	06:39 16:01	07:26 15:31
9	07:39 15:49	07:03 16:40	06:07 17:30	05:58 19:21	04:58 20:10	04:23 20:49	04:32 20:51	05:13 20:12	06:01 19:07	06:48 18:00	06:41 16:00	07:27 15:30
10	07:38 15:50	07:01 16:42	06:05 17:31	05:55 19:23	04:56 20:11	04:23 20:50	04:33 20:51	05:14 20:10	06:02 19:05	06:50 17:57	06:43 15:58	07:28 15:30
11	07:38 15:52	06:59 16:44	06:02 17:33	05:53 19:24	04:55 20:13	04:23 20:50	04:34 20:50	05:16 20:08	06:04 19:03	06:52 17:55	06:45 15:56	07:29 15:30
12	07:37 15:53	06:57 16:46	06:00 17:35	05:51 19:26	04:53 20:14	04:22 20:51	04:35 20:49	05:17 20:06	06:06 19:01	06:53 17:53	06:46 15:55	07:30 15:30
13	07:36 15:55	06:56 16:47	05:58 17:36	05:49 19:28	04:52 20:16	04:22 20:52	04:36 20:48	05:19 20:04	06:07 18:58	06:55 17:51	06:48 15:54	07:31 15:30
14	07:36 15:56	06:54 16:49	05:56 17:38	05:47 19:29	04:50 20:17	04:22 20:52	04:37 20:48	05:20 20:02	06:09 18:56	06:57 17:49	06:50 15:52	07:32 15:30
15	07:35 15:58	06:52 16:51	05:54 17:40	05:45 19:31	04:49 20:19	04:22 20:53	04:38 20:47	05:22 20:00	06:10 18:54	06:58 17:47	06:51 15:51	07:33 15:30
16	07:34 15:59	06:50 16:53	05:51 17:41	05:42 19:33	04:47 20:20	04:22 20:53	04:39 20:46	05:23 19:58	06:12 18:51	07:00 17:45	06:53 15:49	07:34 15:30
17	07:33 16:01	06:48 16:55	05:49 17:43	05:40 19:34	04:46 20:22	04:22 20:54	04:40 20:45	05:25 19:56	06:13 18:49	07:02 17:43	06:55 15:48	07:35 15:30
18	07:32 16:02	06:46 16:56	05:47 17:45	05:38 19:36	04:44 20:23	04:21 20:54	04:42 20:44	05:26 19:54	06:15 18:47	07:03 17:40	06:56 15:47	07:35 15:31
19	07:31 16:04	06:44 16:58	05:45 17:46	05:36 19:37	04:43 20:25	04:22 20:55	04:43 20:43	05:28 19:52	06:16 18:45	07:05 17:38	06:58 15:46	07:36 15:31
20	07:30 16:05	06:42 17:00	05:42 17:48	05:34 19:39	04:42 20:26	04:22 20:55	04:44 20:41	05:30 19:50	06:18 18:42	07:07 17:36	07:00 15:44	07:37 15:31
21	07:29 16:07	06:40 17:02	05:40 17:50	05:32 19:41	04:40 20:27	04:22 20:55	04:45 20:40	05:31 19:48	06:20 18:40	07:08 17:34	07:01 15:43	07:37 15:32
22	07:28 16:09	06:38 17:04	05:38 17:51	05:30 19:42	04:39 20:29	04:22 20:55	04:47 20:39	05:33 19:46	06:21 18:38	07:10 17:32	07:03 15:42	07:38 15:32
23	07:27 16:10	06:36 17:05	05:36 17:53	05:28 19:44	04:38 20:30	04:22 20:56	04:48 20:38	05:34 19:44	06:23 18:36	07:12 17:30	07:05 15:41	07:38 15:33
24	07:26 16:12	06:34 17:07	05:33 17:55	05:26 19:46	04:37 20:31	04:22 20:56	04:49 20:37	05:36 19:42	06:24 18:33	07:13 17:28	07:06 15:40	07:39 15:33
25	07:25 16:14	06:32 17:09	05:31 17:56	05:24 19:47	04:35 20:33	04:23 20:56	04:51 20:35	05:37 19:40	06:26 18:31	07:15 17:26	07:08 15:39	07:39 15:34
26	07:24 16:15	06:30 17:11	05:29 17:58	05:22 19:49	04:34 20:34	04:23 20:56	04:52 20:34	05:39 19:38	06:27 18:29	07:17 17:24	07:09 15:38	07:40 15:34
27	07:22 16:17	06:28 17:12	05:27 18:00	05:20 19:50	04:33 20:35	04:24 20:56	04:53 20:33	05:41 19:36	06:29 18:26	06:19 16:22	07:11 15:37	07:40 15:35
28	07:21 16:19	06:26 17:14	05:24 18:01	05:18 19:52	04:32 20:37	04:24 20:56	04:55 20:31	05:42 19:34	06:31 18:24	06:20 16:21	07:12 15:36	07:40 15:36
29	07:20 16:21	06:25 18:03	05:22 18:03	05:16 19:54	04:31 20:38	04:24 20:56	04:56 20:30	05:44 19:32	06:32 18:22	06:22 16:19	07:14 15:36	07:40 15:37
30	07:18 16:22	06:24 18:05	05:20 18:05	05:14 19:55	04:30 20:39	04:25 20:55	04:58 20:28	05:45 19:29	06:34 18:20	06:24 16:17	07:15 15:35	07:40 15:38
31	07:17 16:24	06:23 19:06	05:19 18:06	05:13 19:56	04:29 20:40	04:26 20:57	04:59 20:27	05:47 19:27	06:33 16:15	06:26 15:15	07:16 15:36	07:40 15:39
Potential sun hours Total, worst case	262	279	367	414	481	494	498	452	381	333	270	248

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Analiza migotania cienia - wariant proponowany H = 143m **Shadow receptor:** C - SH3

Assumptions for shadow calculations

Reference year for calendar 2013

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:40	07:15 16:26	06:24 17:16	06:15 19:08	05:12 19:57	04:29 20:41	04:26 20:55	05:01 20:25	05:48 19:25	06:35 18:17	06:27 16:13	07:17 15:34
2	07:40 15:41	07:14 16:28	06:22 17:18	06:13 19:10	05:10 19:59	04:28 20:42	04:26 20:55	05:02 20:23	05:50 19:23	06:37 18:15	06:29 16:11	07:18 15:33
3	07:40 15:42	07:12 16:29	06:20 17:19	06:11 19:11	05:09 20:00	04:27 20:43	04:27 20:55	05:03 20:22	05:51 19:21	06:39 18:13	06:31 16:10	07:19 15:33
4	07:40 15:43	07:11 16:31	06:18 17:21	06:09 19:13	05:07 20:02	04:26 20:44	04:28 20:54	05:05 20:20	05:53 19:18	06:40 18:11	06:32 16:08	07:21 15:32
5	07:40 15:44	07:09 16:33	06:15 17:23	06:06 19:14	05:05 20:03	04:26 20:45	04:28 20:54	05:06 20:18	05:55 19:16	06:42 18:08	06:34 16:06	07:22 15:32
6	07:40 15:45	07:08 16:35	06:13 17:24	06:04 19:16	05:03 20:05	04:25 20:46	04:29 20:53	05:08 20:17	05:56 19:14	06:43 18:06	06:36 16:04	07:23 15:31
7	07:39 15:47	07:06 16:37	06:11 17:26	06:02 19:18	05:02 20:07	04:24 20:47	04:30 20:53	05:09 20:15	05:58 19:12	06:45 18:04	06:38 16:03	07:24 15:31
8	07:39 15:48	07:04 16:38	06:09 17:28	06:00 19:19	05:00 20:08	04:24 20:48	04:31 20:52	05:11 20:13	05:59 19:10	06:47 18:02	06:39 16:01	07:26 15:31
9	07:39 15:49	07:03 16:40	06:07 17:30	05:58 19:21	04:58 20:10	04:23 20:49	04:32 20:51	05:13 20:11	06:01 19:07	06:48 18:00	06:41 16:00	07:27 15:30
10	07:38 15:50	07:01 16:42	06:05 17:31	05:55 19:23	04:56 20:11	04:23 20:50	04:33 20:51	05:14 20:10	06:02 19:05	06:50 17:57	06:43 15:58	07:28 15:30
11	07:38 15:52	06:59 16:44	06:02 17:33	05:53 19:24	04:55 20:13	04:23 20:50	04:34 20:50	05:16 20:08	06:04 19:03	06:52 17:55	06:45 15:56	07:29 15:30
12	07:37 15:53	06:57 16:46	06:00 17:35	05:51 19:26	04:53 20:14	04:22 20:51	04:35 20:49	05:17 20:06	06:06 19:01	06:53 17:53	06:46 15:55	07:30 15:30
13	07:36 15:55	06:56 16:47	05:58 17:36	05:49 19:28	04:52 20:16	04:22 20:52	04:36 20:48	05:19 20:04	06:07 18:58	06:55 17:51	06:48 15:54	07:31 15:30
14	07:36 15:56	06:54 16:49	05:56 17:38	05:47 19:29	04:50 20:17	04:22 20:52	04:37 20:48	05:20 20:02	06:09 18:56	06:57 17:49	06:50 15:52	07:32 15:30
15	07:35 15:58	06:52 16:51	05:54 17:40	05:45 19:31	04:49 20:19	04:22 20:53	04:38 20:47	05:22 20:00	06:10 18:54	06:58 17:47	06:51 15:51	07:33 15:30
16	07:34 15:59	06:50 16:53	05:51 17:41	05:42 19:33	04:47 20:20	04:22 20:53	04:39 20:46	05:23 19:58	06:12 18:51	07:00 17:45	06:53 15:49	07:34 15:30
17	07:33 16:01	06:48 16:55	05:49 17:43	05:40 19:34	04:46 20:22	04:22 20:54	04:40 20:45	05:25 19:56	06:13 18:49	07:02 17:43	06:55 15:48	07:35 15:30
18	07:32 16:02	06:46 16:56	05:47 17:45	05:38 19:36	04:44 20:23	04:21 20:54	04:42 20:44	05:26 19:54	06:15 18:47	07:03 17:40	06:56 15:47	07:35 15:31
19	07:31 16:04	06:44 16:58	05:45 17:46	05:36 19:37	04:43 20:25	04:22 20:55	04:43 20:43	05:28 19:52	06:16 18:45	07:05 17:38	06:58 15:46	07:36 15:31
20	07:30 16:05	06:42 17:00	05:42 17:48	05:34 19:39	04:42 20:26	04:22 20:55	04:44 20:41	05:30 19:50	06:18 18:42	07:07 17:36	07:00 15:44	07:37 15:31
21	07:29 16:07	06:40 17:02	05:40 17:50	05:32 19:41	04:40 20:27	04:22 20:55	04:45 20:40	05:31 19:48	06:20 18:40	07:08 17:34	07:01 15:43	07:37 15:32
22	07:28 16:09	06:38 17:04	05:38 17:51	05:30 19:42	04:39 20:29	04:22 20:55	04:47 20:39	05:33 19:46	06:21 18:38	07:10 17:32	07:03 15:42	07:38 15:32
23	07:27 16:10	06:36 17:05	05:36 17:53	05:28 19:44	04:38 20:30	04:22 20:56	04:48 20:38	05:34 19:44	06:23 18:36	07:12 17:30	07:05 15:41	07:38 15:33
24	07:26 16:12	06:34 17:07	05:33 17:55	05:26 19:46	04:37 20:31	04:22 20:56	04:49 20:37	05:36 19:42	06:24 18:33	07:13 17:28	07:06 15:40	07:39 15:33
25	07:25 16:14	06:32 17:09	05:31 17:56	05:24 19:47	04:35 20:33	04:23 20:56	04:51 20:35	05:37 19:40	06:26 18:31	07:15 17:26	07:08 15:39	07:39 15:34
26	07:24 16:15	06:30 17:11	05:29 17:58	05:22 19:49	04:34 20:34	04:23 20:56	04:52 20:34	05:39 19:38	06:27 18:29	07:17 17:24	07:09 15:38	07:40 15:34
27	07:22 16:17	06:28 17:12	05:27 18:00	05:20 19:50	04:33 20:35	04:23 20:56	04:53 20:32	05:40 19:36	06:29 18:26	06:19 16:22	07:11 15:37	07:40 15:35
28	07:21 16:19	06:26 17:14	05:24 18:01	05:18 19:52	04:32 20:37	04:24 20:56	04:55 20:31	05:42 19:34	06:31 18:24	06:20 16:20	07:12 15:36	07:40 15:36
29	07:20 16:21	06:25 18:03	05:22 18:03	05:16 19:54	04:31 20:38	04:24 20:56	04:56 20:30	05:44 19:32	06:32 18:22	06:22 16:19	07:14 15:36	07:40 15:37
30	07:18 16:22	06:24 18:05	05:20 18:05	05:14 19:55	04:30 20:39	04:25 20:55	04:58 20:28	05:45 19:29	06:34 18:20	06:24 16:17	07:15 15:35	07:40 15:38
31	07:17 16:24	06:23 19:06	05:19 18:06	05:13 19:56	04:29 20:40	04:24 20:56	04:59 20:27	05:47 19:27	06:33 16:15	06:25 15:38	07:16 15:38	07:40 15:38
Potential sun hours Total, worst case	262	279	367	414	481	494	498	452	381	333	270	248

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Analiza migotania cienia - wariant proponowany H = 143m **Shadow receptor:** D - SH4

Assumptions for shadow calculations

Reference year for calendar

2013

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 15:40	07:15 16:26	06:24 17:16	06:15 19:08	05:12 19:57	04:29 20:41	04:26 20:55	05:01 20:25	05:48 19:25	06:35 18:17	06:27 16:13	07:17 15:34
2	07:40 15:41	07:14 16:28	06:22 17:18	06:13 19:10	05:10 19:59	04:28 20:42	04:26 20:55	05:02 20:23	05:50 19:23	06:37 18:15	06:29 16:11	07:18 15:33
3	07:40 15:42	07:12 16:29	06:20 17:19	06:11 19:11	05:09 20:00	04:27 20:43	04:27 20:54	05:03 20:22	05:51 19:21	06:39 18:13	06:31 16:10	07:19 15:33
4	07:40 15:43	07:11 16:31	06:18 17:21	06:09 19:13	05:07 20:02	04:26 20:44	04:28 20:54	05:05 20:20	05:53 19:18	06:40 18:11	06:32 16:08	07:21 15:32
5	07:40 15:44	07:09 16:33	06:15 17:23	06:06 19:14	05:05 20:03	04:26 20:45	04:28 20:54	05:06 20:18	05:55 19:16	06:42 18:08	06:34 16:06	07:22 15:32
6	07:40 15:45	07:08 16:35	06:13 17:24	06:04 19:16	05:03 20:05	04:25 20:46	04:29 20:53	05:08 20:17	05:56 19:14	06:43 18:06	06:36 16:04	07:23 15:31
7	07:39 15:47	07:06 16:37	06:11 17:26	06:02 19:18	05:02 20:06	04:24 20:47	04:30 20:53	05:09 20:15	05:58 19:12	06:45 18:04	06:38 16:03	07:24 15:31
8	07:39 15:48	07:04 16:38	06:09 17:28	06:00 19:19	05:00 20:08	04:24 20:48	04:31 20:52	05:11 20:13	05:59 19:10	06:47 18:02	06:39 16:01	07:26 15:31
9	07:39 15:49	07:03 16:40	06:07 17:30	05:58 19:21	04:58 20:10	04:23 20:49	04:32 20:51	05:13 20:11	06:01 19:07	06:48 18:00	06:41 16:00	07:27 15:30
10	07:38 15:50	07:01 16:42	06:05 17:31	05:55 19:23	04:56 20:11	04:23 20:50	04:33 20:51	05:14 20:10	06:02 19:05	06:50 17:57	06:43 15:58	07:28 15:30
11	07:38 15:52	06:59 16:44	06:02 17:33	05:53 19:24	04:55 20:13	04:23 20:50	04:34 20:50	05:16 20:08	06:04 19:03	06:52 17:55	06:45 15:56	07:29 15:30
12	07:37 15:53	06:57 16:46	06:00 17:35	05:51 19:26	04:53 20:14	04:22 20:51	04:35 20:49	05:17 20:06	06:05 19:01	06:53 17:53	06:46 15:55	07:30 15:30
13	07:36 15:55	06:56 16:47	05:58 17:36	05:49 19:28	04:52 20:16	04:22 20:52	04:36 20:48	05:19 20:04	06:07 18:58	06:55 17:51	06:48 15:54	07:31 15:30
14	07:36 15:56	06:54 16:49	05:56 17:38	05:47 19:29	04:50 20:17	04:22 20:52	04:37 20:48	05:20 20:02	06:09 18:56	06:57 17:49	06:50 15:52	07:32 15:30
15	07:35 15:58	06:52 16:51	05:54 17:40	05:45 19:31	04:49 20:19	04:22 20:53	04:38 20:47	05:22 20:00	06:10 18:54	06:58 17:47	06:51 15:51	07:33 15:30
16	07:34 15:59	06:50 16:53	05:51 17:41	05:42 19:33	04:47 20:20	04:22 20:53	04:39 20:46	05:23 19:58	06:12 18:51	07:00 17:45	06:53 15:49	07:34 15:30
17	07:33 16:01	06:48 16:55	05:49 17:43	05:40 19:34	04:46 20:22	04:21 20:54	04:40 20:45	05:25 19:56	06:13 18:49	07:02 17:43	06:55 15:48	07:35 15:30
18	07:32 16:02	06:46 16:56	05:47 17:45	05:38 19:36	04:44 20:23	04:21 20:54	04:42 20:44	05:26 19:54	06:15 18:47	07:03 17:40	06:56 15:47	07:35 15:31
19	07:31 16:04	06:44 16:58	05:45 17:46	05:36 19:37	04:43 20:25	04:21 20:55	04:43 20:43	05:28 19:52	06:16 18:45	07:05 17:38	06:58 15:46	07:36 15:31
20	07:30 16:05	06:42 17:00	05:42 17:48	05:34 19:39	04:42 20:26	04:22 20:55	04:44 20:41	05:30 19:50	06:18 18:42	07:07 17:36	07:00 15:44	07:37 15:31
21	07:29 16:07	06:40 17:02	05:40 17:50	05:32 19:41	04:40 20:27	04:22 20:55	04:45 20:40	05:31 19:48	06:20 18:40	07:08 17:34	07:01 15:43	07:37 15:32
22	07:28 16:09	06:38 17:04	05:38 17:51	05:30 19:42	04:39 20:29	04:22 20:55	04:47 20:39	05:33 19:46	06:21 18:38	07:10 17:32	07:03 15:42	07:38 15:32
23	07:27 16:10	06:36 17:05	05:36 17:53	05:28 19:44	04:38 20:30	04:22 20:56	04:48 20:38	05:34 19:44	06:23 18:36	07:12 17:30	07:05 15:41	07:38 15:33
24	07:26 16:12	06:34 17:07	05:33 17:55	05:26 19:46	04:37 20:31	04:22 20:56	04:49 20:37	05:36 19:42	06:24 18:33	07:13 17:28	07:06 15:40	07:39 15:33
25	07:25 16:14	06:32 17:09	05:31 17:56	05:24 19:47	04:35 20:33	04:23 20:56	04:51 20:35	05:37 19:40	06:26 18:31	07:15 17:26	07:08 15:39	07:39 15:34
26	07:24 16:15	06:30 17:11	05:29 17:58	05:22 19:49	04:34 20:34	04:23 20:56	04:52 20:34	05:39 19:38	06:27 18:29	07:17 17:24	07:09 15:38	07:40 15:34
27	07:22 16:17	06:28 17:12	05:27 18:00	05:20 19:50	04:33 20:35	04:23 20:56	04:53 20:32	05:40 19:36	06:29 18:26	06:19 16:22	07:11 15:37	07:40 15:35
28	07:21 16:19	06:26 17:14	05:24 18:01	05:18 19:52	04:32 20:37	04:24 20:56	04:55 20:31	05:42 19:34	06:31 18:24	06:20 16:20	07:12 15:36	07:40 15:36
29	07:20 16:21	06:25 18:03	05:22 18:03	05:16 19:54	04:31 20:38	04:24 20:56	04:56 20:30	05:44 19:32	06:32 18:22	06:22 16:19	07:14 15:36	07:40 15:37
30	07:18 16:22	06:24 18:05	05:20 18:05	05:14 19:55	04:30 20:39	04:25 20:55	04:58 20:28	05:45 19:29	06:34 18:20	06:24 16:17	07:15 15:35	07:40 15:38
31	07:17 16:24	06:23 19:06	05:19 18:06	05:13 19:56	04:29 20:40	04:24 20:57	04:59 20:27	05:47 19:27	06:33 16:15	06:25 15:14	07:16 15:34	07:40 15:38
Potential sun hours	262	279	367	414	481	494	498	452	381	333	270	248
Total, worst case												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Analiza migotania cienia - wariant proponowany H = 143m **Shadow receptor:** E - SH5

Assumptions for shadow calculations

Reference year for calendar 2013

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June			
1	07:41 15:40	07:16 16:26	06:24 17:16	06:15 19:08	06:45 (2) 07:07 (2)	05:12 19:57	06:00 (3) 20:41	04:29 21	06:05 (3) 06:26 (3)
2	07:41 15:41	07:14 16:28	06:22 17:18	06:13 19:10	06:45 (2) 07:07 (2)	05:11 19:59	05:59 (3) 20:42	04:28 19	06:06 (3) 06:25 (3)
3	07:40 15:42	07:13 16:30	06:20 17:19	06:11 19:11	06:44 (2) 07:08 (2)	05:09 20:00	05:58 (3) 20:43	04:27 16	06:08 (3) 06:24 (3)
4	07:40 15:43	07:11 16:31	06:18 17:21	06:09 19:13	06:44 (2) 07:08 (2)	05:07 20:02	05:58 (3) 20:44	04:26 14	06:09 (3) 06:23 (3)
5	07:40 15:44	07:09 16:33	06:16 17:23	06:06 19:15	06:42 (2) 07:07 (2)	05:05 20:03	05:57 (3) 20:45	04:26 11	06:11 (3) 06:22 (3)
6	07:40 15:45	07:08 16:35	06:13 17:25	06:04 19:16	06:42 (2) 07:07 (2)	05:03 20:05	05:56 (3) 20:46	04:25 7	06:13 (3) 06:20 (3)
7	07:39 15:47	07:06 16:37	06:11 17:26	06:02 19:18	06:42 (2) 07:06 (2)	05:02 20:07	05:56 (3) 20:47	04:24 39	06:13 (3) 06:20 (3)
8	07:39 15:48	07:04 16:39	06:09 17:28	06:00 19:19	06:43 (2) 07:06 (2)	05:00 20:08	05:55 (3) 20:48	04:24 40	06:13 (3) 06:22 (3)
9	07:39 15:49	07:03 16:40	06:07 17:30	05:58 19:21	06:43 (2) 07:05 (2)	04:58 20:10	05:55 (3) 20:49	04:24 41	06:13 (3) 06:23 (3)
10	07:38 15:50	07:01 16:42	06:05 17:31	05:55 19:23	06:43 (2) 07:03 (2)	04:57 20:11	05:55 (3) 20:50	04:23 40	06:23 (3) 06:24 (3)
11	07:38 15:52	06:59 16:44	06:02 17:33	05:53 19:24	06:44 (2) 07:01 (2)	04:55 20:13	05:55 (3) 20:51	04:23 41	06:24 (3) 06:25 (3)
12	07:37 15:53	06:58 16:46	06:00 17:35	05:51 19:26	06:46 (2) 06:59 (2)	04:53 20:14	05:55 (3) 20:52	04:22 40	06:25 (3) 06:26 (3)
13	07:36 15:55	06:56 16:48	05:58 17:36	05:49 19:28	06:49 (2) 06:56 (2)	04:52 20:16	05:55 (3) 20:53	04:22 41	06:26 (3) 06:27 (3)
14	07:36 15:56	06:54 16:49	05:56 17:38	05:47 19:29	06:57 (2) 07:04 (2)	04:50 20:17	05:55 (3) 20:54	04:22 40	06:27 (3) 06:28 (3)
15	07:35 15:58	06:52 16:51	05:54 17:40	05:45 19:31	07:05 (2) 07:12 (2)	04:49 20:19	05:55 (3) 20:55	04:22 40	06:28 (3) 06:29 (3)
16	07:34 15:59	06:50 16:53	05:51 17:41	05:43 19:33	07:13 (2) 07:20 (2)	04:47 20:20	05:56 (3) 20:56	04:22 39	06:29 (3) 06:30 (3)
17	07:33 16:01	06:48 16:55	05:49 17:43	05:40 19:34	07:21 (2) 07:28 (2)	04:46 20:22	05:55 (3) 20:57	04:22 39	06:30 (3) 06:31 (3)
18	07:32 16:02	06:46 16:56	05:47 17:45	05:38 19:36	06:03 (1) 06:11 (1)	04:44 20:23	05:56 (3) 20:58	04:22 8	06:31 (3) 06:32 (3)
19	07:32 16:04	06:44 16:58	05:45 17:47	05:36 19:38	06:01 (1) 06:13 (1)	04:43 20:25	05:56 (3) 20:59	04:22 12	06:32 (3) 06:33 (3)
20	07:31 16:05	06:42 17:00	05:42 17:48	05:34 19:39	05:59 (1) 06:14 (1)	04:42 20:26	05:56 (3) 21:00	04:22 15	06:33 (3) 06:34 (3)
21	07:30 16:07	06:40 17:02	05:40 17:50	05:32 19:41	05:58 (1) 06:15 (1)	04:40 20:28	05:57 (3) 21:01	04:22 17	06:34 (3) 06:35 (3)
22	07:28 16:09	06:38 17:04	05:38 17:51	05:30 19:42	05:57 (1) 06:15 (1)	04:39 20:29	05:57 (3) 21:02	04:22 18	06:35 (3) 06:36 (3)
23	07:27 16:10	06:36 17:05	05:36 17:53	05:28 19:44	05:56 (1) 06:15 (1)	04:38 20:30	05:58 (3) 21:03	04:22 19	06:36 (3) 06:37 (3)
24	07:26 16:12	06:34 17:07	05:33 17:55	05:26 19:46	05:56 (1) 06:15 (1)	04:37 20:32	05:59 (3) 21:04	04:22 19	06:37 (3) 06:38 (3)
25	07:25 16:14	06:32 17:09	05:31 17:56	05:24 19:47	05:56 (1) 06:20 (3)	04:35 20:33	05:59 (3) 21:05	04:23 24	06:38 (3) 06:39 (3)
26	07:24 16:16	06:30 17:11	05:29 17:58	05:22 19:49	05:56 (1) 06:25 (3)	04:34 20:34	06:00 (3) 21:06	04:23 29	06:39 (3) 06:40 (3)
27	07:22 16:17	06:28 17:12	05:27 18:00	05:20 19:51	05:56 (1) 06:27 (3)	04:33 20:35	06:01 (3) 21:07	04:24 31	06:40 (3) 06:41 (3)
28	07:21 16:19	06:26 17:14	05:24 18:01	05:18 19:52	05:56 (1) 06:29 (3)	04:32 20:37	06:01 (3) 21:08	04:24 33	06:41 (3) 06:42 (3)
29	07:20 16:21	06:24 18:03	05:22 18:03	05:16 19:54	05:57 (1) 06:30 (3)	04:31 20:38	06:02 (3) 21:09	04:25 26	06:42 (3) 06:43 (3)
30	07:18 16:22	06:22 18:05	05:20 18:05	05:14 19:55	05:59 (1) 06:32 (3)	04:30 20:39	06:03 (3) 21:10	04:25 24	06:43 (3) 06:44 (3)
31	07:17 16:24	06:20 19:06	05:18 19:06	05:12 07:06 (2)	06:33 (3) 06:40 (2)	04:29 20:40	06:04 (3) 21:11	04:26 23	06:44 (3) 06:45 (3)
Potential sun hours	262	279	367	414	481	494			
Total, worst case			47	559	1096	88			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Analiza migotania cienia - wariant proponowany H = 143m **Shadow receptor:** E - SH5

Assumptions for shadow calculations

Reference year for calendar 2013

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

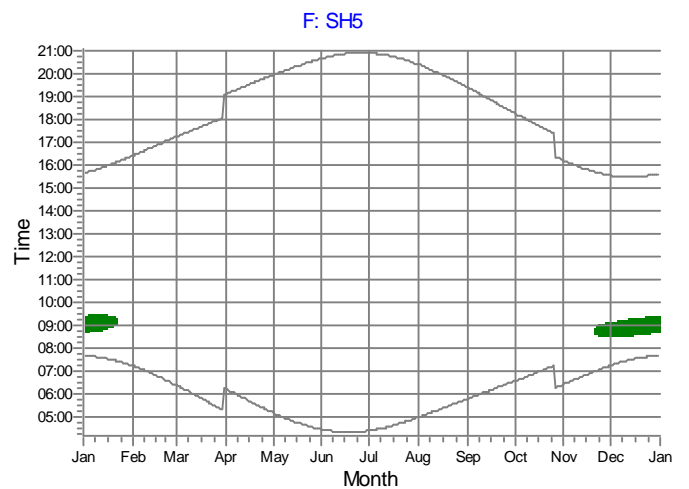
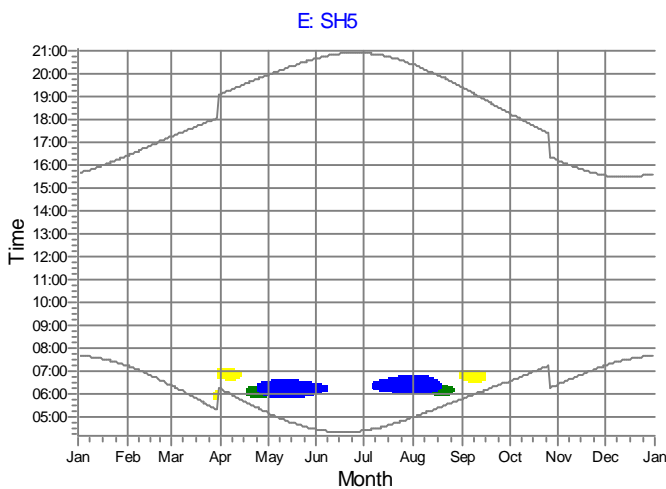
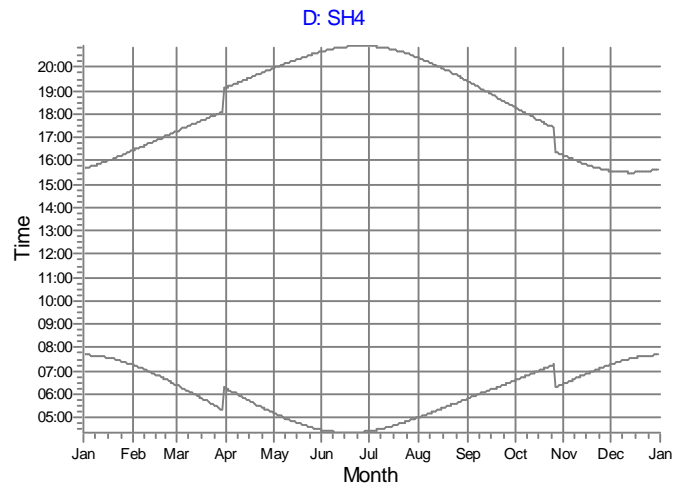
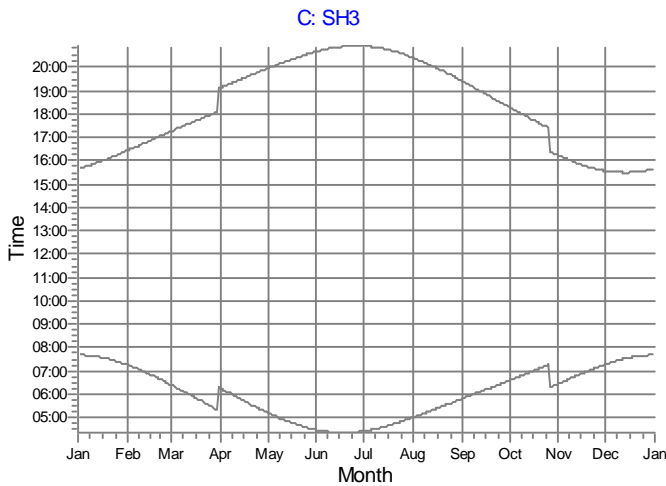
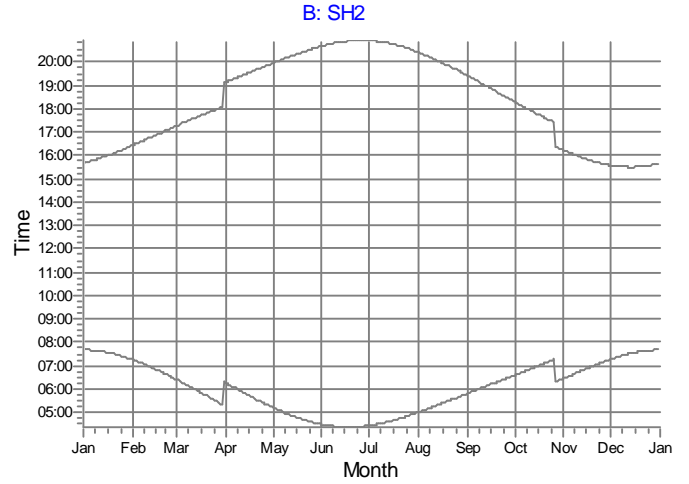
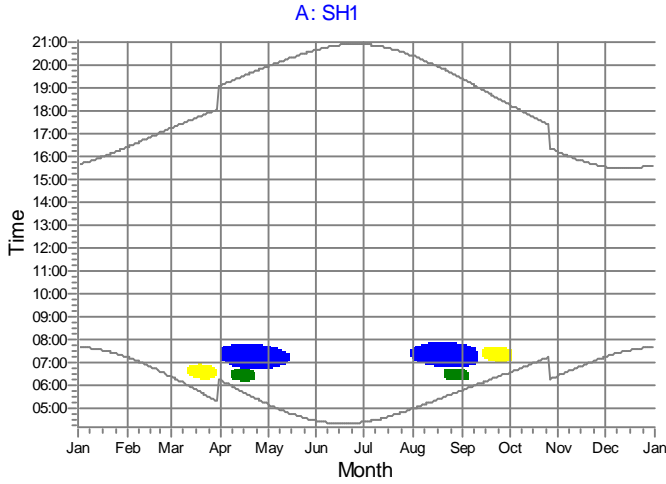
	July	August	September	October	November	December
1	04:26	05:01	06:05 (3) 05:48	06:45 (2) 06:35	06:27	07:17
	20:55	20:25	40 06:45 (3) 19:25	15 07:00 (2) 18:18	16:13	15:34
2	04:26	05:02	06:05 (3) 05:50	06:42 (2) 06:37	06:29	07:18
	20:55	20:24	41 06:46 (3) 19:23	19 07:01 (2) 18:15	16:11	15:34
3	04:27	05:04	06:05 (3) 05:52	06:42 (2) 06:39	06:31	07:19
	20:55	20:22	40 06:45 (3) 19:21	20 07:02 (2) 18:13	16:10	15:33
4	04:28	05:05	06:06 (3) 05:53	06:40 (2) 06:40	06:33	07:21
	20:54	20:20	40 06:46 (3) 19:19	22 07:02 (2) 18:11	16:08	15:32
5	04:28	05:07	06:05 (3) 05:55	06:39 (2) 06:42	06:34	07:22
	20:54	20:19	40 06:45 (3) 19:16	24 07:03 (2) 18:09	16:06	15:32
6	04:29	05:08	06:05 (3) 05:56	06:38 (2) 06:44	06:36	07:23
	20:53	20:17	40 06:45 (3) 19:14	25 07:03 (2) 18:06	16:04	15:31
7	04:30	06:19 (3) 05:10	06:06 (3) 05:58	06:38 (2) 06:45	06:38	07:25
	20:53	8 06:27 (3) 20:15	39 06:45 (3) 19:12	25 07:03 (2) 18:04	16:03	15:31
8	04:31	06:18 (3) 05:11	06:06 (3) 05:59	06:37 (2) 06:47	06:39	07:26
	20:52	11 06:29 (3) 20:13	38 06:44 (3) 19:10	25 07:02 (2) 18:02	16:01	15:31
9	04:32	06:16 (3) 05:13	06:07 (3) 06:01	06:38 (2) 06:48	06:41	07:27
	20:52	14 06:30 (3) 20:12	37 06:44 (3) 19:07	24 07:02 (2) 18:00	16:00	15:31
10	04:33	06:15 (3) 05:14	06:07 (3) 06:02	06:37 (2) 06:50	06:43	07:28
	20:51	17 06:32 (3) 20:10	36 06:43 (3) 19:05	24 07:01 (2) 17:58	15:58	15:30
11	04:34	06:14 (3) 05:16	06:08 (3) 06:04	06:38 (2) 06:52	06:45	07:29
	20:50	19 06:33 (3) 20:08	34 06:42 (3) 19:03	22 07:00 (2) 17:55	15:57	15:30
12	04:35	06:13 (3) 05:17	06:08 (3) 06:06	06:38 (2) 06:53	06:46	07:30
	20:49	21 06:34 (3) 20:06	33 06:41 (3) 19:01	20 06:58 (2) 17:53	15:55	15:30
13	04:36	06:12 (3) 05:19	06:07 (1) 06:07	06:39 (2) 06:55	06:48	07:31
	20:49	23 06:35 (3) 20:04	33 06:40 (3) 18:58	18 06:57 (2) 17:51	15:54	15:30
14	04:37	06:12 (3) 05:20	06:05 (1) 06:09	06:40 (2) 06:57	06:50	07:32
	20:48	24 06:36 (3) 20:02	33 06:38 (3) 18:56	15 06:55 (2) 17:49	15:52	15:30
15	04:38	06:11 (3) 05:22	06:04 (1) 06:10	06:43 (2) 06:58	06:51	07:33
	20:47	26 06:37 (3) 20:00	32 06:36 (3) 18:54	9 06:52 (2) 17:47	15:51	15:30
16	04:39	06:10 (3) 05:23	06:03 (1) 06:12	07:00	06:53	07:34
	20:46	28 06:38 (3) 19:58	32 06:35 (3) 18:52	17:45	15:49	15:30
17	04:40	06:10 (3) 05:25	06:02 (1) 06:13	07:02	06:55	07:35
	20:45	30 06:40 (3) 19:56	30 06:32 (3) 18:49	17:43	15:48	15:30
18	04:42	06:10 (3) 05:27	06:02 (1) 06:15	07:03	06:57	07:35
	20:44	30 06:40 (3) 19:55	26 06:28 (3) 18:47	17:40	15:47	15:31
19	04:43	06:09 (3) 05:28	06:01 (1) 06:17	07:05	06:58	07:36
	20:43	32 06:41 (3) 19:53	19 06:20 (1) 18:45	17:38	15:46	15:31
20	04:44	06:08 (3) 05:30	06:02 (1) 06:18	07:07	07:00	07:37
	20:42	33 06:41 (3) 19:50	19 06:21 (1) 18:42	17:36	15:44	15:31
21	04:45	06:08 (3) 05:31	06:01 (1) 06:20	07:08	07:01	07:37
	20:40	34 06:42 (3) 19:48	19 06:20 (1) 18:40	17:34	15:43	15:32
22	04:47	06:07 (3) 05:33	06:02 (1) 06:21	07:10	07:03	07:38
	20:39	35 06:42 (3) 19:46	17 06:19 (1) 18:38	17:32	15:42	15:32
23	04:48	06:08 (3) 05:34	06:02 (1) 06:23	07:12	07:05	07:38
	20:38	36 06:44 (3) 19:44	16 06:18 (1) 18:36	17:30	15:41	15:33
24	04:49	06:07 (3) 05:36	06:04 (1) 06:24	07:14	07:06	07:39
	20:37	37 06:44 (3) 19:42	13 06:17 (1) 18:33	17:28	15:40	15:33
25	04:51	06:06 (3) 05:37	06:05 (1) 06:26	07:15	07:08	07:39
	20:35	38 06:44 (3) 19:40	9 06:14 (1) 18:31	17:26	15:39	15:34
26	04:52	06:06 (3) 05:39	06:09 (1) 06:28	07:17	07:09	07:40
	20:34	38 06:44 (3) 19:38	1 06:10 (1) 18:29	17:24	15:38	15:34
27	04:53	06:06 (3) 05:41	06:29	06:19	07:11	07:40
	20:33	39 06:45 (3) 19:36	18:27	16:22	15:37	15:35
28	04:55	06:06 (3) 05:42	06:31	06:20	07:12	07:40
	20:31	39 06:45 (3) 19:34	18:24	16:21	15:36	15:36
29	04:56	06:05 (3) 05:44	06:32	06:22	07:14	07:40
	20:30	40 06:45 (3) 19:32	18:22	16:19	15:36	15:37
30	04:58	06:06 (3) 05:45	06:34	06:24	07:15	07:40
	20:28	40 06:46 (3) 19:29	18:20	16:17	15:35	15:38
31	04:59	06:05 (3) 05:47	06:47 (2)	06:26		07:41
	20:27	41 06:46 (3) 19:27	11 06:58 (2)	16:15		15:39
Potential sun hours	498	452	381	333	270	248
Total, worst case	733	768	307			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar, graphical

Calculation: Analiza migotania cienia - wariant proponowany H = 143m



WTGs

1: EW3

2: EW2

3: EW1

SHADOW - Calendar per WTG

Calculation: Analiza migotania cienia - wariant proponowany H = 143m **WTG:** 1 - EW3

Assumptions for shadow calculations

Reference year for calendar 2013

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June
1	07:41 08:47-09:22/35	07:15	06:24	06:15	05:12 06:01-06:07/6	04:29
	15:40	16:26	17:16	19:08	19:57	20:41
2	07:40 08:48-09:23/35	07:14	06:22	06:13	05:10	04:28
	15:41	16:28	17:18	19:10	19:59	20:42
3	07:40 08:47-09:23/36	07:12	06:20	06:11	05:09	04:27
	15:42	16:29	17:19	19:11	20:00	20:43
4	07:40 08:48-09:23/35	07:11	06:18	06:09	05:07	04:26
	15:43	16:31	17:21	19:13	20:02	20:44
5	07:40 08:49-09:24/35	07:09	06:15	06:06	05:05	04:26
	15:44	16:33	17:23	19:14	20:03	20:45
6	07:40 08:49-09:24/35	07:08	06:13	06:04	05:03	04:25
	15:45	16:35	17:24	19:16	20:05	20:46
7	07:39 08:50-09:24/34	07:06	06:11	06:02	05:01	04:24
	15:46	16:37	17:26	19:18	20:07	20:47
8	07:39 08:51-09:24/33	07:04	06:09	06:00 06:27-06:35/8	05:00	04:24
	15:48	16:38	17:28	19:19	20:08	20:48
9	07:39 08:52-09:25/33	07:03	06:07	05:58 06:24-06:38/14	04:58	04:23
	15:49	16:40	17:30	19:21	20:10	20:49
10	07:38 08:52-09:24/32	07:01	06:05	05:55 06:21-06:38/17	04:56	04:23
	15:50	16:42	17:31	19:23	20:11	20:50
11	07:38 08:53-09:24/31	06:59	06:02	05:53 06:20-06:39/19	04:55	04:23
	15:52	16:44	17:33	19:24	20:13	20:50
12	07:37 08:53-09:24/31	06:57	06:00	05:51 06:19-06:40/21	04:53	04:22
	15:53	16:46	17:35	19:26	20:14	20:51
13	07:36 08:55-09:25/30	06:56	05:58	05:49 06:19-06:40/21	04:52	04:22
	15:55	16:47	17:36	19:28	20:16	20:52
14	07:36 08:56-09:24/28	06:54	05:56	05:47 06:18-06:40/22	04:50	04:22
	15:56	16:49	17:38	19:29	20:17	20:52
15	07:35 08:57-09:24/27	06:52	05:53	05:45 06:18-06:40/22	04:49	04:22
	15:58	16:51	17:40	19:31	20:19	20:53
16	07:34 08:58-09:23/25	06:50	05:51	05:42 06:18-06:40/22	04:47	04:22
	15:59	16:53	17:41	19:33	20:20	20:53
17	07:33 08:59-09:23/24	06:48	05:49	05:40 06:18-06:39/21	04:46	04:21
	16:01	16:55	17:43	19:34	20:22	20:54
18	07:32 09:00-09:22/22	06:46	05:47	05:38 06:03-06:11/8	04:44	04:21
	16:02	16:56	17:45	19:36 06:18-06:39/21	20:23	20:54
19	07:31 09:02-09:21/19	06:44	05:45	05:36 06:01-06:13/12	04:43	04:21
	16:04	16:58	17:46	19:37 06:19-06:38/19	20:25	20:55
20	07:30 09:04-09:20/16	06:42	05:42	05:34 05:59-06:14/15	04:42	04:22
	16:05	17:00	17:48	19:39 06:19-06:36/17	20:26	20:55
21	07:29 09:06-09:17/11	06:40	05:40	05:32 05:58-06:15/17	04:40	04:22
	16:07	17:02	17:50	19:41 06:21-06:35/14	20:27	20:55
22	07:28	06:38	05:38	05:30 05:57-06:15/18	04:39	04:22
	16:09	17:04	17:51	19:42 06:22-06:32/10	20:29	20:55
23	07:27	06:36	05:36	05:28 05:56-06:15/19	04:38	04:22
	16:10	17:05	17:53	19:44	20:30	20:56
24	07:26	06:34	05:33	05:26 05:56-06:15/19	04:37	04:22
	16:12	17:07	17:55	19:46	20:31	20:56
25	07:25	06:32	05:31	05:24 05:56-06:15/19	04:35	04:23
	16:14	17:09	17:56	19:47	20:33	20:56
26	07:24	06:30	05:29	05:22 05:56-06:14/18	04:34	04:23
	16:15	17:11	17:58	19:49	20:34	20:56
27	07:22	06:28	05:27	05:20 05:56-06:13/17	04:33	04:23
	16:17	17:12	18:00	19:50	20:35	20:56
28	07:21	06:26	05:24	05:18 05:56-06:12/16	04:32	04:24
	16:19	17:14	18:01	19:52	20:37	20:56
29	07:20		05:22	05:16 05:57-06:11/14	04:31	04:24
	16:21		18:03	19:54	20:38	20:56
30	07:18		05:20	05:14 05:59-06:10/11	04:30	04:25
	16:22		18:05	19:55	20:39	20:55
31	07:17		06:18		04:29	
	16:24		19:06		20:40	
Potential sun hours	262	279	367	414	481	494
Sum of minutes with flicker	607	0	0	471	6	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Analiza migotania cienia - wariant proponowany H = 143m **WTG: 1 - EW3**

Assumptions for shadow calculations

Reference year for calendar 2013

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	July	August	September	October	November	December
1	04:26 20:55	05:00 20:25	05:48 19:25	06:20-06:39/19 18:17	06:27 16:13	07:17 15:34
2	04:26 20:55	05:02 20:23	05:50 19:23	06:20-06:37/17 18:15	06:29 16:11	07:18 15:33
3	04:27 20:55	05:03 20:22	05:51 19:21	06:21-06:36/15 18:13	06:31 16:10	07:19 15:33
4	04:28 20:54	05:05 20:20	05:53 19:18	06:22-06:33/11 18:11	06:32 16:08	07:21 15:32
5	04:28 20:54	05:06 20:18	05:55 19:16	06:42 18:08	06:34 16:06	07:22 15:32
6	04:29 20:53	05:08 20:17	05:56 19:14	06:43 18:06	06:36 16:04	07:23 15:31
7	04:30 20:53	05:09 20:15	05:58 19:12	06:45 18:04	06:38 16:03	07:25 15:31
8	04:31 20:52	05:11 20:13	05:59 19:10	06:47 18:02	06:39 16:01	07:26 15:31
9	04:32 20:51	05:12 20:12	06:01 19:07	06:48 18:00	06:41 16:00	07:27 15:30
10	04:33 20:51	05:14 20:10	06:02 19:05	06:50 17:57	06:43 15:58	07:28 15:30
11	04:34 20:50	05:16 20:08	06:04 19:03	06:52 17:55	06:45 15:56	07:29 15:30
12	04:35 20:49	05:17 20:06	06:05 19:01	06:53 17:53	06:46 15:55	07:30 15:30
13	04:36 20:48	05:19 20:04	06:07 18:58	06:55 17:51	06:48 15:53	07:31 15:30
14	04:37 20:48	05:20 20:02	06:09 18:56	06:57 17:49	06:50 15:52	07:32 15:30
15	04:38 20:47	05:22 20:00	06:10 18:54	06:58 17:47	06:51 15:51	07:33 15:30
16	04:39 20:46	05:23 19:58	06:12 18:51	07:00 17:45	06:53 15:49	07:34 15:30
17	04:40 20:45	05:25 19:56	06:13 18:49	07:02 17:42	06:55 15:48	07:35 15:30
18	04:42 20:44	05:26 19:54	06:15 18:47	07:03 17:40	06:56 15:47	07:35 15:31
19	04:43 20:43	05:28 19:52	06:16 18:45	07:05 17:38	06:58 15:45	07:36 15:31
20	04:44 20:41	05:30 19:50	06:18 18:42	07:07 17:36	07:00 15:44	07:37 15:31
21	04:45 20:40	05:31 19:48	06:20 18:40	07:08 17:34	07:01 15:43	07:37 15:32
22	04:47 20:39	05:33 19:46	06:21 18:38	07:10 17:32	07:03 15:42	07:38 15:32
23	04:48 20:38	05:34 19:44	06:23 18:36	07:12 17:30	07:05 15:41	07:38 15:32
24	04:49 20:37	05:36 19:42	06:24 18:33	07:13 17:28	07:06 15:40	07:39 15:33
25	04:51 20:35	05:37 19:40	06:26 18:31	07:15 17:26	07:08 15:39	07:39 15:34
26	04:52 20:34	05:39 19:38	06:27 18:29	07:17 17:24	07:09 15:38	07:40 15:34
27	04:53 20:33	05:40 19:36	06:29 18:26	07:19 16:22	07:11 15:37	07:40 15:35
28	04:55 20:31	05:42 19:34	06:31 18:24	07:20 16:20	07:12 15:36	07:40 15:36
29	04:56 20:30	05:44 19:32	06:32 18:22	07:22 16:19	07:14 15:35	07:40 15:37
30	04:58 20:28	05:45 19:29	06:34 18:20	07:24 16:17	07:15 15:35	07:40 15:38
31	04:59 20:27	05:47 19:27	06:36 18:18	07:25 16:15	07:16 15:34	07:40 15:38
Potential sun hours	498	452	381	333	270	248
Sum of minutes with flicker	0	421	62	0	223	1093

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Analiza migotania cienia - wariant proponowany H = 143m **WTG:** 3 - EW1

Assumptions for shadow calculations

Reference year for calendar 2013

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June		
1	07:41 15:40	07:16 16:26	06:24 17:16	06:15 19:08	05:12 19:57	06:00-06:32/32 06:52-07:41/49	04:29 20:41	
2	07:41 15:41	07:14 16:28	06:22 17:18	06:13 19:10	07:18-07:31/13 19:10	05:10 19:59	06:59-06:33/34 06:52-07:39/47	04:28 20:42
3	07:40 15:42	07:13 16:29	06:20 17:19	06:11 19:11	07:13-07:35/22 19:11	05:09 20:00	05:58-06:33/35 06:53-07:38/45	04:27 20:43
4	07:40 15:43	07:11 16:31	06:18 17:21	06:09 19:13	07:10-07:39/29 19:13	05:07 20:02	05:58-06:34/36 06:54-07:37/43	04:26 20:44
5	07:40 15:44	07:09 16:33	06:15 17:23	06:06 19:15	07:07-07:40/33 19:15	05:05 20:03	05:57-06:35/38 06:55-07:36/41	04:26 20:45
6	07:40 15:45	07:08 16:35	06:13 17:24	06:04 19:16	07:05-07:42/37 19:16	05:03 20:05	05:56-06:35/39 06:55-07:34/39	04:25 20:46
7	07:39 15:47	07:06 16:37	06:11 17:26	06:02 19:18	07:03-07:43/40 19:18	05:02 20:07	05:56-06:35/39 06:57-07:33/36	04:24 20:47
8	07:39 15:48	07:04 16:38	06:09 17:28	06:00 19:19	07:01-07:44/43 19:19	05:00 20:08	05:55-06:35/40 06:58-07:31/33	04:24 20:48
9	07:39 15:49	07:03 16:40	06:07 17:30	05:58 19:21	07:00-07:45/45 19:21	04:58 20:10	05:55-06:36/41 07:00-07:30/30	04:23 20:49
10	07:38 15:50	07:01 16:42	06:05 17:31	05:55 19:23	06:58-07:45/47 19:23	04:56 20:11	05:55-06:35/40 07:01-07:28/27	04:23 20:50
11	07:38 15:52	06:59 16:44	06:02 17:33	05:53 19:24	06:57-07:46/49 19:24	04:55 20:13	05:55-06:36/41 07:03-07:26/23	04:23 20:50
12	07:37 15:53	06:57 16:46	06:00 17:35	05:51 19:26	06:56-07:47/51 19:26	04:53 20:14	05:55-06:35/40 07:05-07:23/18	04:22 20:51
13	07:36 15:55	06:56 16:47	05:58 17:36	05:49 19:28	06:55-07:47/52 19:28	04:52 20:16	05:55-06:36/41 07:09-07:19/10	04:22 20:52
14	07:36 15:56	06:54 16:49	05:56 17:38	05:47 19:29	06:54-07:48/54 19:29	04:50 20:17	05:55-06:35/40 07:05-07:23/18	04:22 20:52
15	07:35 15:58	06:52 16:51	05:54 17:40	05:45 19:31	06:53-07:48/55 19:31	04:49 20:19	05:55-06:35/40 07:05-07:23/18	04:22 20:53
16	07:34 15:59	06:50 16:53	05:51 17:41	05:43 19:33	06:53-07:48/55 19:33	04:47 20:20	05:56-06:35/39 07:05-07:23/18	04:22 20:53
17	07:33 16:01	06:48 16:55	05:49 17:43	05:40 19:34	06:52-07:48/56 19:34	04:46 20:22	05:55-06:34/39 07:05-07:23/18	04:21 20:54
18	07:32 16:02	06:46 16:56	05:47 17:45	05:38 19:36	06:52-07:48/56 19:36	04:44 20:23	05:56-06:34/38 07:05-07:23/18	04:21 20:54
19	07:31 16:04	06:44 16:58	05:45 17:46	05:36 19:37	06:51-07:48/57 19:37	04:43 20:25	05:56-06:34/38 07:05-07:23/18	04:22 20:55
20	07:30 16:05	06:42 17:00	05:42 17:48	05:34 19:39	06:51-07:48/57 19:39	04:42 20:26	05:56-06:33/37 07:05-07:23/18	04:22 20:55
21	07:29 16:07	06:40 17:02	05:40 17:50	05:32 19:41	06:51-07:47/56 19:41	04:40 20:27	05:57-06:33/36 07:05-07:23/18	04:22 20:55
22	07:28 16:09	06:38 17:04	05:38 17:51	05:30 19:42	06:51-07:47/56 19:42	04:39 20:29	05:57-06:32/35 07:05-07:23/18	04:22 20:55
23	07:27 16:10	06:36 17:05	05:36 17:53	05:28 19:44	06:50-07:46/56 19:44	04:38 20:30	05:58-06:32/34 07:05-07:23/18	04:22 20:56
24	07:26 16:12	06:34 17:07	05:33 17:55	05:26 19:46	06:50-07:46/56 19:46	04:37 20:32	05:59-06:31/32 07:05-07:23/18	04:22 20:56
25	07:25 16:14	06:32 17:09	05:31 17:56	05:24 19:47	06:14-06:20/6 06:50-07:45/55	04:35 20:33	05:59-06:31/32 07:05-07:23/18	04:23 20:56
26	07:24 16:15	06:30 17:11	05:29 17:58	05:22 19:49	06:09-06:25/16 06:50-07:44/54	04:34 20:34	06:00-06:30/30 07:05-07:23/18	04:23 20:56
27	07:22 16:17	06:28 17:12	05:27 18:00	05:20 19:51	06:06-06:27/21 06:50-07:44/54	04:33 20:35	06:01-06:30/29 07:05-07:23/18	04:23 20:56
28	07:21 16:19	06:26 17:14	05:24 18:01	05:18 19:52	06:04-06:29/25 06:50-07:43/53	04:32 20:37	06:01-06:29/28 07:05-07:23/18	04:24 20:56
29	07:20 16:21	06:24 18:03	05:22 18:03	05:16 19:54	06:02-06:30/28 06:51-07:42/51	04:31 20:38	06:02-06:28/26 07:05-07:23/18	04:24 20:56
30	07:18 16:22	06:22 18:05	05:20 18:05	05:14 19:55	06:01-06:32/31 06:52-07:42/50	04:30 20:39	06:04-06:28/24 07:05-07:23/18	04:25 20:55
31	07:17 16:24	06:20 19:06	06:18 19:06	06:12 19:06	06:50-07:42/50 19:06	04:29 20:40	06:04-06:27/23 07:05-07:23/18	04:25 20:55
Potential sun hours	262	279	367	414	481	494	88	
Sum of minutes with flicker	0	0	0	1519	1537	88		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Analiza migotania cienia - wariant proponowany H = 143m **WTG:** 3 - EW1

Assumptions for shadow calculations

Reference year for calendar 2013

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

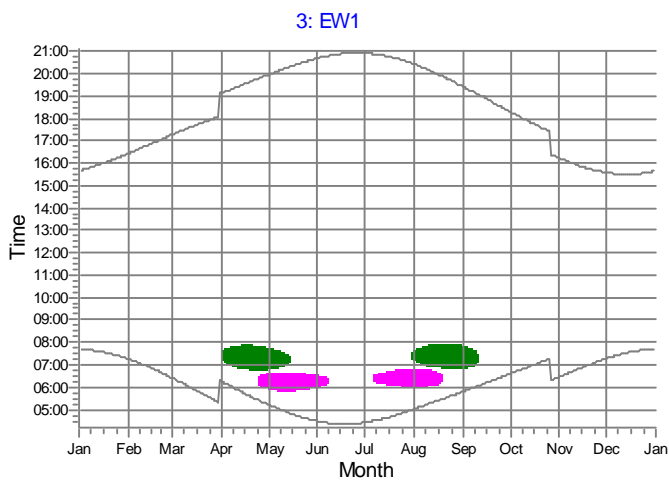
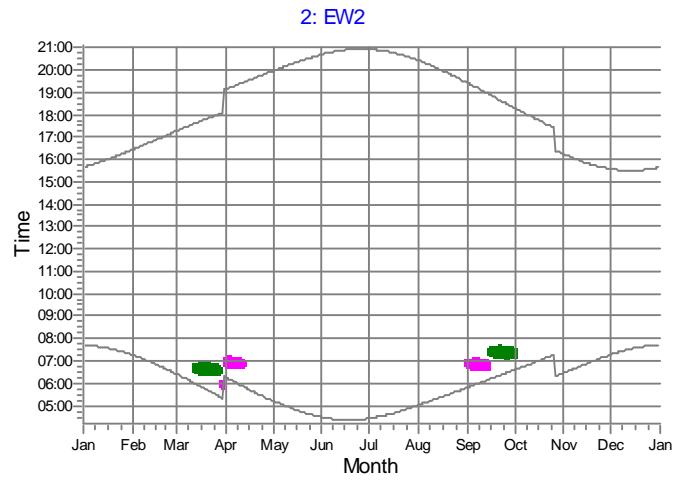
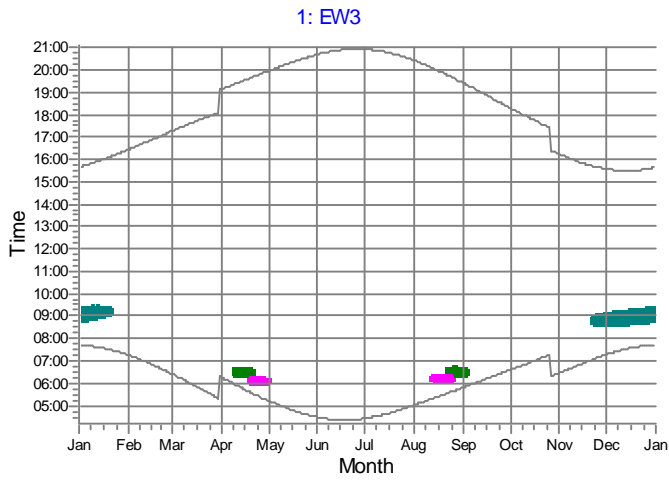
	July	August	September	October	November	December
1	04:26	05:01 06:05-06:45/40	05:48 06:56-07:46/50	06:35	06:27	07:17
	20:55	20:25 07:15-07:33/18	19:25	18:17	16:13	15:34
2	04:26	05:02 06:05-06:46/41	05:50 06:56-07:45/49	06:37	06:29	07:18
	20:55	20:23 07:13-07:36/23	19:23	18:15	16:11	15:33
3	04:27	05:03 06:05-06:45/40	05:51 06:57-07:44/47	06:39	06:31	07:19
	20:55	20:22 07:11-07:38/27	19:21	18:13	16:10	15:33
4	04:28	05:05 06:06-06:46/40	05:53 06:58-07:42/44	06:40	06:32	07:21
	20:54	20:20 07:10-07:40/30	19:18	18:11	16:08	15:32
5	04:28	05:06 06:05-06:45/40	05:55 06:59-07:41/42	06:42	06:34	07:22
	20:54	20:19 07:08-07:41/33	19:16	18:09	16:06	15:32
6	04:29	05:08 06:05-06:45/40	05:56 07:00-07:38/38	06:44	06:36	07:23
	20:53	20:17 07:06-07:42/36	19:14	18:06	16:04	15:31
7	04:30 06:19-06:27/8	05:09 06:06-06:45/39	05:58 07:02-07:37/35	06:45	06:38	07:25
	20:53	20:15 07:05-07:44/39	19:12	18:04	16:03	15:31
8	04:31 06:18-06:29/11	05:11 06:06-06:44/38	05:59 07:03-07:34/31	06:47	06:39	07:26
	20:52	20:13 07:04-07:45/41	19:10	18:02	16:01	15:31
9	04:32 06:16-06:30/14	05:13 06:07-06:44/37	06:01 07:06-07:31/25	06:48	06:41	07:27
	20:52	20:12 07:03-07:47/44	19:07	18:00	16:00	15:30
10	04:33 06:15-06:32/17	05:14 06:07-06:43/36	06:02 07:08-07:27/19	06:50	06:43	07:28
	20:51	20:10 07:02-07:47/45	19:05	17:58	15:58	15:30
11	04:34 06:14-06:33/19	05:16 06:08-06:42/34	06:04	06:52	06:45	07:29
	20:50	20:08 07:02-07:48/46	19:03	17:55	15:56	15:30
12	04:35 06:13-06:34/21	05:17 06:08-06:41/33	06:06	06:53	06:46	07:30
	20:49	20:06 07:00-07:49/49	19:01	17:53	15:55	15:30
13	04:36 06:12-06:35/23	05:19 06:09-06:40/31	06:07	06:55	06:48	07:31
	20:49	20:04 07:00-07:50/50	18:58	17:51	15:54	15:30
14	04:37 06:12-06:36/24	05:20 06:10-06:38/28	06:09	06:57	06:50	07:32
	20:48	20:02 06:59-07:50/51	18:56	17:49	15:52	15:30
15	04:38 06:11-06:37/26	05:22 06:11-06:36/25	06:10	06:58	06:51	07:33
	20:47	20:00 06:58-07:50/52	18:54	17:47	15:51	15:30
16	04:39 06:10-06:38/28	05:23 06:13-06:35/22	06:12	07:00	06:53	07:34
	20:46	19:58 06:58-07:51/53	18:52	17:45	15:49	15:30
17	04:40 06:10-06:40/30	05:25 06:15-06:32/17	06:13	07:02	06:55	07:35
	20:45	19:56 06:57-07:51/54	18:49	17:43	15:48	15:30
18	04:42 06:10-06:40/30	05:26 06:19-06:28/9	06:15	07:03	06:56	07:35
	20:44	19:54 06:57-07:51/54	18:47	17:40	15:47	15:31
19	04:43 06:09-06:41/32	05:28 06:56-07:51/55	06:16	07:05	06:58	07:36
	20:43	19:52	18:45	17:38	15:46	15:31
20	04:44 06:08-06:41/33	05:30 06:56-07:52/56	06:18	07:07	07:00	07:37
	20:42	19:50	18:42	17:36	15:44	15:31
21	04:45 06:08-06:42/34	05:31 06:55-07:51/56	06:20	07:08	07:01	07:37
	20:40	19:48	18:40	17:34	15:43	15:32
22	04:47 06:07-06:42/35	05:33 06:55-07:52/57	06:21	07:10	07:03	07:38
	20:39	19:46	18:38	17:32	15:42	15:32
23	04:48 06:08-06:44/36	05:34 06:54-07:51/57	06:23	07:12	07:05	07:38
	20:38	19:44	18:36	17:30	15:41	15:33
24	04:49 06:07-06:44/37	05:36 06:55-07:51/56	06:24	07:13	07:06	07:39
	20:37	19:42	18:33	17:28	15:40	15:33
25	04:51 06:06-06:44/38	05:37 06:54-07:51/57	06:26	07:15	07:08	07:39
	20:35	19:40	18:31	17:26	15:39	15:34
26	04:52 06:06-06:44/38	05:39 06:55-07:51/56	06:27	07:17	07:09	07:40
	20:34	19:38	18:29	17:24	15:38	15:34
27	04:53 06:06-06:45/39	05:41 06:54-07:50/56	06:29	07:19	07:11	07:40
	20:33	19:36	18:26	17:22	15:37	15:35
28	04:55 06:06-06:45/39	05:42 06:55-07:50/55	06:31	07:20	07:12	07:40
	20:31	19:34	18:24	17:21	15:36	15:36
29	04:56 06:05-06:45/40	05:44 06:54-07:48/54	06:32	07:22	07:14	07:40
	20:30	19:32	18:22	17:19	15:36	15:37
30	04:58 06:06-06:46/40	05:45 06:55-07:48/53	06:34	07:24	07:15	07:40
	20:28	19:29	18:20	17:17	15:35	15:38
31	04:59 06:05-06:46/41	05:47 06:55-07:47/52		07:26		07:40
	20:27 07:19-07:29/10	19:27		16:15		15:38
Potential sun hours	498	452	381	333	270	248
Sum of minutes with flicker	743	2055	380	0	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG, graphical

Calculation: Analiza migotania cienia - wariant proponowany H = 143m



Shadow receptors

A: SH1

E: SH5

F: SH5