

Project:

Pawlowo_Golancz_miasto_07102010

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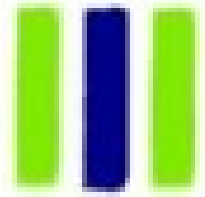
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** A - Shadow Receptor: 1.5 × 1.5 Azimuth: 83.6° Slope: 90.0° (0**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

January		February		March		April		May		June	
1	08:04	13:56 (5)	07:36	06:40	15:50 (4)	06:28	18:13 (3)	05:20	19:44 (1)	04:33	
	15:45	34	14:30 (5)	16:34	17:28	30	16:20 (4)	19:24	36	18:49 (3)	20:18
2	08:04	13:57 (5)	07:34	06:38	15:52 (4)	06:25	18:12 (3)	05:18	19:44 (1)	04:32	
	15:46	34	14:31 (5)	16:36	17:30	27	16:19 (4)	19:26	36	18:48 (3)	20:19
3	08:04	13:58 (5)	07:33	06:36	15:54 (4)	06:23	18:12 (3)	05:16	19:44 (1)	04:31	
	15:47	33	14:31 (5)	16:38	17:32	23	16:17 (4)	19:28	36	18:48 (3)	20:21
4	08:04	13:58 (5)	07:31	06:34	15:56 (4)	06:20	18:12 (3)	05:15	19:44 (1)	04:30	
	15:48	33	14:31 (5)	16:40	17:34	18	16:14 (4)	19:30	35	18:47 (3)	20:23
5	08:04	13:59 (5)	07:29	06:31	16:00 (4)	06:18	18:12 (3)	05:13	19:43 (1)	04:30	
	15:49	33	14:32 (5)	16:42	17:36	10	16:10 (4)	19:32	34	18:46 (3)	20:25
6	08:03	13:59 (5)	07:27	16:03 (4)	06:29	06:16	18:13 (3)	05:11	19:43 (1)	04:29	
	15:51	33	14:32 (5)	16:44	8	16:11 (4)	17:37	19:33	32	18:45 (3)	20:26
7	08:03	14:00 (5)	07:26	15:59 (4)	06:27	06:13	18:14 (3)	05:09	19:44 (1)	04:28	
	15:52	32	14:32 (5)	16:46	16	16:15 (4)	17:39	19:35	31	18:45 (3)	20:28
8	08:02	14:01 (5)	07:24	15:56 (4)	06:24	06:11	18:14 (3)	05:07	19:45 (1)	04:28	
	15:53	31	14:32 (5)	16:48	21	16:17 (4)	17:41	19:37	29	18:43 (3)	20:30
9	08:02	14:01 (5)	07:22	15:54 (4)	06:22	06:09	18:15 (3)	05:05	19:45 (1)	04:27	
	15:55	31	14:32 (5)	16:50	25	16:19 (4)	17:43	19:39	26	18:41 (3)	20:31
10	08:01	14:02 (5)	07:20	15:53 (4)	06:20	06:06	18:17 (3)	05:03	19:47 (1)	04:27	
	15:56	30	14:32 (5)	16:52	28	16:21 (4)	17:45	19:40	25	19:14 (2)	20:33
11	08:01	14:04 (5)	07:18	15:52 (4)	06:17	06:04	18:18 (3)	05:02	19:49 (1)	04:26	
	15:58	28	14:32 (5)	16:54	30	16:22 (4)	17:47	19:42	24	19:15 (2)	20:35
12	08:00	14:05 (5)	07:16	15:51 (4)	06:15	06:02	18:21 (3)	05:00	19:55 (1)	04:25	
	15:59	27	14:32 (5)	16:56	32	16:23 (4)	17:48	19:44	21	19:17 (2)	20:36
13	07:59	14:06 (5)	07:14	15:50 (4)	06:13	05:59	19:09 (2)	04:58	19:09 (2)	04:58	
	16:01	26	14:32 (5)	16:58	34	16:24 (4)	17:50	19:46	10	19:19 (2)	20:38
14	07:58	14:07 (5)	07:12	15:49 (4)	06:10	05:57	19:08 (2)	04:57	19:08 (2)	04:57	
	16:02	24	14:31 (5)	16:59	36	16:25 (4)	17:52	19:48	13	19:21 (2)	20:40
15	07:58	14:08 (5)	07:10	15:49 (4)	06:08	05:55	19:07 (2)	04:55	19:07 (2)	04:55	
	16:04	23	14:31 (5)	17:01	37	16:26 (4)	17:54	19:49	15	19:22 (2)	20:41
16	07:57	14:10 (5)	07:08	15:47 (4)	06:06	05:53	19:08 (2)	04:53	19:08 (2)	04:53	
	16:05	20	14:30 (5)	17:03	39	16:26 (4)	17:56	19:51	16	19:24 (2)	20:43
17	07:56	14:11 (5)	07:06	15:47 (4)	06:03	05:50	19:08 (2)	04:52	19:08 (2)	04:52	
	16:07	17	14:28 (5)	17:05	39	16:26 (4)	17:58	19:53	17	19:25 (2)	20:45
18	07:55	14:13 (5)	07:04	15:47 (4)	06:01	05:48	19:09 (2)	04:50	19:09 (2)	04:50	
	16:09	14	14:27 (5)	17:07	40	16:27 (4)	17:59	19:55	15	19:24 (2)	20:46
19	07:54	14:17 (5)	07:02	15:47 (4)	05:59	05:46	19:10 (2)	04:49	19:10 (2)	04:49	
	16:11	8	14:25 (5)	17:09	40	16:27 (4)	18:01	19:56	13	19:23 (2)	20:48
20	07:53	07:00		15:47 (4)	05:56	05:44	19:12 (2)	04:47	19:12 (2)	04:47	
	16:12		17:11	40	16:27 (4)	18:03	19:58	9	19:21 (2)	20:49	
21	07:51	06:58		15:47 (4)	05:54	17:28 (3)	05:41			04:46	
	16:14		17:13	40	16:27 (4)	18:05	11	17:39 (3)	20:00	20:51	
22	07:50	06:56		15:46 (4)	05:51	17:24 (3)	05:39			04:44	
	16:16		17:15	40	16:26 (4)	18:07	16	17:40 (3)	20:02	20:52	
23	07:49	06:54		15:47 (4)	05:49	17:22 (3)	05:37			04:43	
	16:18		17:17	39	16:26 (4)	18:08	20	17:42 (3)	20:04	20:54	
24	07:48	06:52		15:47 (4)	05:47	17:20 (3)	05:35			04:42	
	16:19		17:19	39	16:26 (4)	18:10	25	17:45 (3)	20:05	20:55	
25	07:46	06:49		15:48 (4)	05:44	17:18 (3)	05:33			04:41	
	16:21		17:21	37	16:25 (4)	18:12	28	17:46 (3)	20:07	20:57	
26	07:45	06:47		15:48 (4)	05:42	17:17 (3)	05:31			04:39	
	16:23		17:22	36	16:24 (4)	18:14	31	17:48 (3)	20:09	20:58	
27	07:44	06:45		15:49 (4)	05:39	17:15 (3)	05:29			04:38	
	16:25		17:24	34	16:23 (4)	18:15	33	17:48 (3)	20:11	20:59	
28	07:42	06:43		15:50 (4)	05:37	17:15 (3)	05:27			04:37	
	16:27		17:26	32	16:22 (4)	18:17	34	17:49 (3)	20:12	21:01	
29	07:41			06:35		18:14 (3)	05:24			04:36	
	16:29			19:19	35	18:49 (3)	20:14			21:02	
30	07:39			06:32		18:13 (3)	05:22	19:45 (1)	04:35	04:29	
	16:31			19:21	36	18:49 (3)	20:16	2	19:47 (1)	21:03	
31	07:38			06:30		18:13 (3)				04:34	
	16:32			19:23	36	18:49 (3)				21:04	
Potential sun hours	254		275		367		418		475		505
Total, worst case	511		762		413		475		111		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

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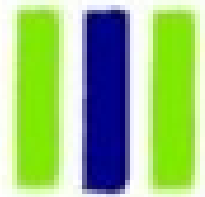
Os. Bolesława Chrobrego 24/45

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Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** A - Shadow Receptor: 1.5 × 1.5 Azimuth: 83.6° Slope: 90.0° (°)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	July	August	September	October	November	December
1	04:29 21:20	05:08 20:47	06:00 19:42	18:17 (3) 19:14 (2)	06:51 18:30	06:47 15:23 (4)
2	04:30 21:20	05:09 20:45	19:58 (1) 20:06 (1)	06:01 19:40	18:15 (3) 19:12 (2)	06:53 18:28
3	04:31 21:19	05:11 20:43	19:56 (1) 20:07 (1)	06:03 19:37	18:13 (3) 18:26	06:54 16:18
4	04:32 21:19	05:12 20:41	19:55 (1) 20:09 (1)	06:05 19:35	18:11 (3) 18:23	06:56 16:16
5	04:33 21:18	05:14 20:39	19:54 (1) 20:09 (1)	06:06 19:33	18:10 (3) 18:21	06:58 16:15
6	04:33 21:18	05:16 20:38	19:54 (1) 20:07 (1)	06:08 19:30	18:09 (3) 18:19	07:00 16:13
7	04:34 21:17	05:17 20:36	19:53 (1) 20:05 (1)	06:10 19:28	18:08 (3) 18:16	07:01 16:11
8	04:35 21:16	05:19 20:34	19:53 (1) 20:04 (1)	06:12 19:26	18:07 (3) 18:14	07:03 16:09
9	04:36 21:16	05:21 20:32	19:53 (1) 20:02 (1)	06:13 19:23	18:07 (3) 18:12	07:05 16:33 (4)
10	04:37 21:15	05:22 20:30	19:52 (1) 20:00 (1)	06:15 19:21	18:05 (3) 18:09	07:07 16:50 (4)
11	04:38 21:14	05:24 20:28	19:53 (1) 19:59 (1)	06:17 19:19	18:05 (3) 18:07	07:08 16:52 (4)
12	04:40 21:13	05:26 20:26	19:53 (1) 19:56 (1)	06:18 19:16	18:04 (3) 18:05	07:10 16:54 (4)
13	04:41 21:12	05:27 20:24	19:54 (1) 19:56 (1)	06:20 19:14	18:04 (3) 18:02	07:12 16:54 (4)
14	04:42 21:11	05:29 20:22	06:22 19:11	18:05 (3) 18:00	07:14 18:00	16:22 (4) 16:55 (4)
15	04:43 21:10	05:31 20:20	06:23 19:09	18:04 (3) 18:38 (3)	07:16 17:58	16:21 (4) 16:56 (4)
16	04:44 21:09	05:32 20:18	06:25 19:07	18:05 (3) 18:38 (3)	07:17 17:56	16:20 (4) 16:56 (4)
17	04:46 21:08	05:34 20:16	06:27 19:04	18:05 (3) 18:37 (3)	07:19 17:53	16:19 (4) 16:57 (4)
18	04:47 21:07	05:36 20:13	06:29 19:02	18:05 (3) 18:34 (3)	07:21 17:51	16:18 (4) 16:57 (4)
19	04:48 21:06	05:38 20:11	06:30 18:59	18:07 (3) 18:32 (3)	07:23 17:49	16:18 (4) 16:57 (4)
20	04:50 21:05	05:39 20:09	06:32 18:57	18:08 (3) 18:29 (3)	07:25 17:47	16:18 (4) 16:58 (4)
21	04:51 21:03	05:41 20:07	06:34 18:54	18:09 (3) 18:26 (3)	07:27 17:45	16:17 (4) 16:58 (4)
22	04:52 21:02	05:43 20:05	06:35 19:19 (2) 19:21 (2)	18:12 (3) 18:24 (3)	07:28 17:42	16:17 (4) 16:57 (4)
23	04:54 21:01	05:44 20:03	06:37 19:15 (2) 19:25 (2)	07:30 17:40 17:40	16:17 (4) 16:57 (4)	16:57 (4) 15:47
24	04:55 20:59	05:46 20:00	06:39 19:14 (2) 19:27 (2)	07:32 17:38 17:38	16:17 (4) 16:57 (4)	16:57 (4) 15:46
25	04:57 20:58	05:48 19:58	06:41 19:12 (2) 19:27 (2)	06:34 16:36 16:36	15:18 (4) 15:56 (4)	07:31 15:45
26	04:58 20:56	05:49 19:56	06:42 19:11 (2) 19:28 (2)	06:36 16:34 16:34	15:18 (4) 15:56 (4)	07:32 15:44
27	05:00 20:55	05:51 19:54	06:44 19:09 (2) 19:25 (2)	06:38 16:32 16:32	15:18 (4) 15:55 (4)	07:34 15:43
28	05:01 20:53	05:53 19:51	06:46 19:09 (2) 19:23 (2)	06:39 16:30 16:30	15:19 (4) 15:55 (4)	07:35 15:42
29	05:03 20:51	05:55 19:49	06:47 19:09 (2) 19:21 (2)	06:41 16:28 16:28	15:20 (4) 15:54 (4)	07:37 15:41
30	05:04 20:50	05:56 19:47	06:49 19:09 (2) 19:19 (2)	06:43 16:26 16:26	15:21 (4) 15:53 (4)	07:39 15:40
31	05:06 20:48	05:58 19:44	06:50 18:21 (3) 19:17 (2)	06:45 16:24 16:24	15:22 (4) 15:52 (4)	07:40 15:40
Potential sun hours	507	457	382	330	263	238
Total, worst case		242	652	785	249	1054

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

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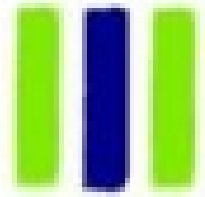
Os. Bolesława Chrobrego 24/45

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+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** B - Shadow Receptor: 1.5 × 1.5 Azimuth: 69.8° Slope: 90.0° (°)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
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 Time step for calculation 1 minutes

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The WTG is always operating

January		February		March		April		May		June	
1	08:04	14:30 (5)	07:36	06:40	16:10 (4)	06:28	18:18 (3)	05:20	19:37 (1)	04:33	
	15:45	31	15:01 (5)	16:34	17:28	26	16:36 (4)	19:24	26	18:44 (3)	20:18
2	08:04	14:30 (5)	07:34	06:38	16:11 (4)	06:25	18:18 (3)	05:18	19:39 (1)	04:32	
	15:46	32	15:02 (5)	16:36	17:30	24	16:35 (4)	19:26	24	18:42 (3)	20:19
3	08:04	14:31 (5)	07:33	06:36	16:13 (4)	06:23	18:20 (3)	05:16	19:40 (1)	04:31	
	15:47	32	15:03 (5)	16:38	17:32	20	16:33 (4)	19:28	21	18:41 (3)	20:21
4	08:04	14:31 (5)	07:31	06:34	16:15 (4)	06:20	18:21 (3)	05:15	19:42 (1)	04:30	
	15:48	32	15:03 (5)	16:40	17:34	15	16:30 (4)	19:30	17	18:38 (3)	20:23
5	08:04	14:32 (5)	07:29	06:31	16:19 (4)	06:18	18:23 (3)	05:13	5	19:47 (1)	21:09
	15:49	32	15:04 (5)	16:42	17:36	7	16:26 (4)	19:32	13	18:36 (3)	20:25
6	08:03	14:32 (5)	07:27	06:29	16:16	06:16	05:11	04:30			
	15:51	32	15:04 (5)	16:44	17:37	19:33	20:26	21:10			
7	08:03	14:33 (5)	07:26	06:27	16:13	06:13	19:08 (2)	05:09	04:28		
	15:52	32	15:05 (5)	16:46	17:39	19:35	2	19:10 (2)	20:28	21:12	
8	08:02	14:33 (5)	07:24	06:24	16:11	06:11	19:06 (2)	05:07	04:28		
	15:53	32	15:05 (5)	16:48	17:41	19:37	4	19:10 (2)	20:30	21:13	
9	08:02	14:33 (5)	07:22	06:22	16:09	06:09	19:06 (2)	05:05	04:27		
	15:55	32	15:05 (5)	16:50	17:43	19:39	6	19:12 (2)	20:31	21:14	
10	08:01	14:33 (5)	07:20	06:20	16:06	06:06	19:06 (2)	05:03	04:27		
	15:56	32	15:05 (5)	16:52	17:45	19:40	8	19:14 (2)	20:33	21:15	
11	08:01	14:35 (5)	07:18	16:22 (4)	06:17	06:04	19:05 (2)	05:02	04:26		
	15:58	31	15:06 (5)	16:54	16:25 (4)	17:47	19:42	10	19:15 (2)	20:35	21:15
12	08:00	14:35 (5)	07:16	16:18 (4)	06:15	06:02	19:05 (2)	05:00	04:26		
	15:59	31	15:06 (5)	16:56	16:27 (4)	17:48	19:44	12	19:17 (2)	20:36	21:16
13	07:59	14:35 (5)	07:14	16:15 (4)	06:13	05:59	19:05 (2)	04:58	04:26		
	16:01	31	15:06 (5)	16:58	16:29 (4)	17:50	19:46	14	19:19 (2)	20:38	21:17
14	07:58	14:36 (5)	07:12	16:14 (4)	06:10	05:57	19:06 (2)	04:56	04:25		
	16:02	30	15:06 (5)	16:59	16:31 (4)	17:52	19:48	13	19:19 (2)	20:40	21:17
15	07:58	14:37 (5)	07:10	16:12 (4)	06:08	05:55	19:07 (2)	04:55	04:25		
	16:04	30	15:07 (5)	17:01	16:33 (4)	17:54	19:49	10	19:17 (2)	20:41	21:18
16	07:57	14:38 (5)	07:08	16:10 (4)	06:06	05:53	19:11 (2)	04:53	04:25		
	16:05	29	15:07 (5)	17:03	16:35 (4)	17:56	19:51	2	19:13 (2)	20:43	21:19
17	07:56	14:38 (5)	07:06	16:10 (4)	06:03	05:50	04:52	04:25			
	16:07	28	15:06 (5)	17:05	16:37 (4)	17:58	19:53	20:45	21:19		
18	07:55	14:39 (5)	07:04	16:09 (4)	06:01	17:32 (3)	05:48	04:50	04:25		
	16:09	27	15:06 (5)	17:07	16:39 (4)	17:59	2	17:34 (3)	19:55	20:46	21:19
19	07:54	14:40 (5)	07:02	16:09 (4)	05:59	17:28 (3)	05:46	04:49	04:25		
	16:11	26	15:06 (5)	17:09	16:40 (4)	18:01	8	17:36 (3)	19:56	20:48	21:20
20	07:52	14:41 (5)	07:00	16:08 (4)	05:56	17:25 (3)	05:44	04:47	04:25		
	16:12	25	15:06 (5)	17:11	16:41 (4)	18:03	12	17:37 (3)	19:58	20:49	21:20
21	07:51	14:42 (5)	06:58	16:08 (4)	05:54	17:23 (3)	05:41	04:46	04:25		
	16:14	23	15:05 (5)	17:13	16:41 (4)	18:05	16	17:39 (3)	20:00	20:51	21:20
22	07:50	14:43 (5)	06:56	16:07 (4)	05:51	17:21 (3)	05:39	04:44	04:25		
	16:16	21	15:04 (5)	17:15	16:40 (4)	18:07	19	17:40 (3)	20:02	20:52	21:21
23	07:49	14:44 (5)	06:54	16:07 (4)	05:49	17:20 (3)	05:37	04:43	04:26		
	16:18	19	15:03 (5)	17:17	16:40 (4)	18:08	22	17:42 (3)	20:04	20:54	21:21
24	07:48	14:47 (5)	06:51	16:08 (4)	05:47	17:19 (3)	05:35	04:42	04:26		
	16:19	15	15:02 (5)	17:19	16:40 (4)	18:10	26	17:45 (3)	20:05	20:55	21:21
25	07:46	14:49 (5)	06:49	16:08 (4)	05:44	17:18 (3)	05:33	19:38 (1)	04:41	04:26	
	16:21	10	14:59 (5)	17:21	16:40 (4)	18:12	28	17:46 (3)	20:07	2	19:40 (1)
26	07:45		06:47	16:08 (4)	05:42	17:18 (3)	05:31	19:38 (1)	04:39	04:27	
	16:23		17:22	31	16:39 (4)	18:14	29	17:47 (3)	20:09	2	19:40 (1)
27	07:44		06:45	16:08 (4)	05:39	17:17 (3)	05:29	19:37 (1)	04:38	04:27	
	16:25		17:24	30	16:38 (4)	18:15	30	17:47 (3)	20:11	5	19:42 (1)
28	07:42		06:43	16:09 (4)	05:37	17:17 (3)	05:27	19:37 (1)	04:37	04:28	
	16:27		17:26	29	16:38 (4)	18:17	30	17:47 (3)	20:12	6	19:43 (1)
29	07:41				06:35	18:17 (3)	05:24	19:37 (1)	04:36	04:28	
	16:29				19:19	30	18:47 (3)	20:14	8	19:45 (1)	21:02
30	07:39				06:32	18:17 (3)	05:22	19:37 (1)	04:35	04:29	
	16:31				19:21	28	18:45 (3)	20:16	10	19:47 (1)	21:03
31	07:38				06:30	18:17 (3)		04:34			
	16:32				19:23	28	18:45 (3)	21:04			
Potential sun hours	254		275		367		418		490		505
Total, worst case		695		463		400		215		37	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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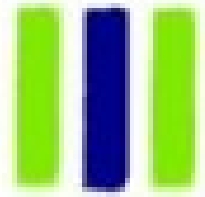
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** B - Shadow Receptor: 1.5 × 1.5 Azimuth: 69.8° Slope: 90.0° (°)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	July	August	September	October	November	December
1	04:29 21:20	05:08 20:46	06:00 19:42	19:04 (2) 18:30	06:51 16:22	07:40 15:40
2	04:30 21:20	05:09 20:45	06:01 19:40	19:04 (2) 18:28	06:49 16:20	07:41 15:39
3	04:31 21:19	05:11 20:43	06:03 19:37	19:04 (2) 18:26	06:51 16:18	07:43 15:38
4	04:32 21:19	05:12 20:41	06:05 19:35	19:03 (2) 18:23	06:53 16:16	07:44 15:38
5	04:32 21:18	05:14 20:39	06:06 19:33	19:04 (2) 18:21	06:54 16:15	07:46 15:37
6	04:33 21:18	05:16 20:38	06:08 19:30	19:06 (2) 18:19	06:56 16:13	07:47 15:37
7	04:34 21:17	05:17 20:36	06:10 19:28	18:19 (3) 18:16	07:01 16:11	07:48 15:36
8	04:35 21:16	05:19 20:34	06:12 19:26	18:16 (3) 18:14	07:03 16:09	07:50 15:36
9	04:36 21:16	05:21 20:32	19:51 (1) 19:23	18:14 (3) 18:12	07:05 16:51 (4)	07:51 15:35
10	04:37 21:15	05:22 20:30	19:57 (1) 19:21	18:35 (3) 18:09	16:07 17:04 (4)	07:52 15:35
11	04:38 21:14	05:24 20:28	19:48 (1) 19:19	18:12 (3) 18:07	07:07 16:48 (4)	07:53 15:35
12	04:40 21:13	05:26 20:26	19:58 (1) 19:16	18:11 (3) 18:05	07:06 16:46 (4)	07:54 15:35
13	04:41 21:12	05:27 20:24	19:46 (1) 19:14	18:09 (3) 18:02	07:10 16:44 (4)	07:55 15:35
14	04:42 21:11	05:29 20:22	19:56 (1) 19:11	18:08 (3) 18:00	07:09 16:42 (4)	07:56 15:35
15	04:43 21:10	05:31 20:20	19:44 (1) 19:09	18:06 (3) 17:58	07:13 16:40 (4)	07:57 15:35
16	04:44 21:09	05:32 20:18	19:51 (1) 19:07	18:36 (3) 17:56	07:15 17:11 (4)	07:58 15:35
17	04:46 21:08	05:34 20:16	19:45 (1) 19:04	18:06 (3) 17:53	07:15 16:39 (4)	07:59 15:35
18	04:47 21:07	05:36 20:13	19:46 (1) 19:02	18:06 (3) 17:51	07:17 17:12 (4)	08:00 14:23 (5)
19	04:48 21:06	05:38 20:11	18:05 (3) 18:59	07:21 17:49	07:18 16:39 (4)	08:01 14:33 (5)
20	04:50 21:05	05:39 20:09	18:06 (3) 18:57	07:23 17:47	07:20 17:11 (4)	08:02 14:38 (5)
21	04:51 21:03	05:41 20:07	18:06 (3) 18:54	07:27 17:45	07:24 16:39 (4)	08:02 14:41 (5)
22	04:52 21:02	05:43 20:05	18:07 (3) 18:52	07:28 17:42	07:25 17:11 (4)	08:02 14:42 (5)
23	04:54 21:01	05:44 20:03	18:09 (3) 18:50	07:30 17:40	07:27 16:39 (4)	08:03 14:43 (5)
24	04:55 20:59	05:46 20:00	18:11 (3) 18:47	07:32 17:38	07:29 16:40 (4)	08:03 14:43 (5)
25	04:57 20:58	05:48 19:58	18:13 (3) 18:45	06:34 18:17 (3)	07:31 16:07 (4)	08:03 14:44 (5)
26	04:58 20:56	05:49 19:56	06:42 18:42	16:36 16:34	07:32 15:41 (4)	08:04 14:45 (5)
27	05:00 20:55	05:51 19:54	19:12 (2) 18:40	06:44 16:32	07:34 15:42 (4)	08:04 14:46 (5)
28	05:01 20:53	05:53 19:51	19:09 (2) 18:38	06:46 16:30	07:35 15:44 (4)	08:04 14:46 (5)
29	05:03 20:51	05:55 19:49	19:07 (2) 18:35	06:47 16:28	07:37 15:45 (4)	08:04 14:46 (5)
30	05:04 20:50	05:56 19:47	19:20 (2) 18:33	06:49 16:26	07:39 15:48 (4)	08:04 14:47 (5)
31	05:06 20:48	05:58 19:44	19:05 (2) 19:17 (2)	06:45 16:24	07:40 15:50 (4)	08:04 14:48 (5)
Potential sun hours	507	457	382	330	263	238
Total, worst case		122	443	560	344	976

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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Licensed user:

EMPEKO

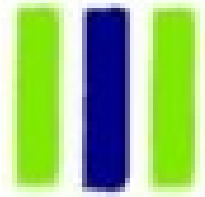
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznań

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** C - Shadow Receptor: 1.5 × 1.5 Azimuth: 10.6° Slope: 90.0° (°)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m

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

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:05 15:45	07:36 16:34	06:40 17:28	06:28 19:24	05:20 20:18	04:33 21:06	04:29 21:20	05:08 20:47	06:00 19:42	06:51 18:31	18 17:45 (1) 18:03 (1)	06:47 16:22	15:21 (2) 15:40	07:40
2	08:04 15:46	07:34 16:36	06:38 17:30	06:25 19:26	05:18 20:19	04:32 21:07	04:30 21:20	05:09 20:45	06:01 19:40	06:53 18:28	13 17:47 (1) 18:00 (1)	06:49 16:20	15:22 (2) 15:42	07:42
3	08:04 15:47	07:33 16:38	16:00 (2) 17:32	06:36 19:28	05:16 20:21	04:31 21:08	04:31 21:19	05:11 20:43	06:03 19:38	06:54 18:26	2 17:53 (1) 17:55 (1)	06:51 16:18	15:23 (2) 15:48 (2)	07:43
4	08:04 15:48	07:31 16:40	15:58 (2) 17:34	06:34 19:30	05:15 20:23	04:30 21:09	04:32 21:19	05:12 20:41	06:05 19:35	06:56 18:23	17:55 (1)	06:53 16:16	15:23 (2) 15:46 (2)	07:44
5	08:04 15:49	07:29 16:42	15:56 (2) 17:36	06:31 19:32	05:13 20:25	04:30 21:10	04:33 21:18	05:14 20:39	06:07 19:33	06:58 18:21	17:55 (1)	06:55 16:15	15:25 (2) 15:44 (2)	07:46
6	08:03 15:51	07:27 16:44	15:55 (2) 17:37	06:16 19:33	05:11 20:26	04:29 21:11	04:33 21:18	05:16 20:38	06:08 19:30	07:00 18:19	17:55 (1)	06:56 16:13	15:26 (2) 15:42 (2)	07:47
7	08:03 15:52	07:26 16:46	15:54 (2) 17:39	06:13 19:35	05:09 20:28	04:28 21:12	04:34 21:17	05:17 20:36	06:10 19:28	07:01 18:16	17:55 (1)	06:58 16:11	15:28 (2) 15:40 (2)	07:48
8	08:02 15:53	07:24 16:48	15:53 (2) 17:41	06:11 19:37	05:07 20:30	04:28 21:13	04:35 21:17	05:19 20:34	06:12 19:26	07:03 18:14	17:55 (1)	07:00 16:09	15:31 (2) 15:38 (2)	07:50
9	08:02 15:55	07:22 16:50	15:52 (2) 17:43	06:09 19:39	05:05 20:31	04:27 21:14	04:36 21:16	05:21 20:32	06:13 19:23	07:05 18:12	17:55 (1)	07:02 16:07	15:32 (2) 15:35	07:51
10	08:01 15:56	07:20 16:52	15:51 (2) 17:45	06:06 19:40	05:03 20:33	04:27 21:15	04:37 21:15	05:22 20:30	06:15 19:21	07:07 18:09	17:55 (1)	07:04 16:06	15:33 (2) 15:35	07:52
11	08:01 15:58	07:18 16:54	15:51 (2) 17:47	17:10 (1) 19:42	05:02 20:35	04:26 21:15	04:38 21:14	05:24 20:28	06:17 19:19	07:09 18:07	17:55 (1)	07:06 16:04	15:34 (2) 15:35	07:53
12	08:00 15:59	07:16 16:56	15:51 (2) 17:48	17:06 (1) 19:44	05:00 20:36	04:26 21:16	04:40 21:13	05:26 20:26	06:18 19:16	07:10 18:05	17:55 (1)	07:08 16:02	15:35 (2) 15:35	07:54
13	07:59 16:01	07:14 16:58	15:51 (2) 17:50	17:04 (1) 19:46	04:58 20:38	04:26 21:17	04:41 21:12	05:27 20:24	06:20 19:14	07:12 18:02	17:55 (1)	07:09 16:01	15:36 (2) 15:35	07:55
14	07:58 16:02	07:12 16:59	15:51 (2) 17:52	17:03 (1) 19:48	04:57 20:40	04:25 21:18	04:42 21:11	05:29 20:22	06:22 19:11	07:14 18:07 (1)	17:55 (1)	07:11 16:00	15:37 (2) 15:35	07:56
15	07:58 16:04	07:10 17:01	15:51 (2) 17:54	17:01 (1) 19:49	04:55 20:41	04:25 21:18	04:43 21:10	05:31 20:20	06:23 19:09	07:16 18:09 (1)	17:55 (1)	07:13 16:00	15:38 (2) 15:35	07:57
16	07:57 16:05	07:08 17:03	15:50 (2) 17:56	17:00 (1) 19:51	04:53 20:43	04:25 21:19	04:44 21:09	05:32 20:18	06:25 19:07	07:17 18:11 (1)	17:55 (1)	07:15 16:00	15:39 (2) 15:35	07:58
17	07:56 16:07	07:06 17:05	15:51 (2) 17:58	16:59 (1) 19:53	04:52 20:45	04:25 21:19	04:46 21:08	05:34 20:16	06:27 19:04	07:19 18:12 (1)	17:55 (1)	07:17 16:00	15:40 (2) 15:35	07:59
18	07:55 16:09	07:04 17:07	15:51 (2) 17:59	16:58 (1) 19:55	04:50 20:46	04:25 21:20	04:47 21:07	05:36 20:14	06:29 19:02	07:21 18:12 (1)	17:55 (1)	07:18 16:02	15:41 (2) 15:35	08:00
19	07:54 16:11	07:02 17:09	15:52 (2) 18:01	16:58 (1) 19:56	04:49 20:48	04:25 21:20	04:48 21:06	05:38 20:11	06:30 18:59	07:23 18:13 (1)	17:55 (1)	07:20 16:02	15:42 (2) 15:35	08:00
20	07:53 16:12	07:00 17:11	15:53 (2) 18:03	16:57 (1) 19:58	04:47 20:49	04:25 21:20	04:50 21:05	05:39 20:09	06:32 18:57	07:25 18:13 (1)	17:55 (1)	07:22 16:04	15:43 (2) 15:35	08:01
21	07:51 16:14	06:58 17:13	15:55 (2) 18:05	16:57 (1) 19:58	04:46 20:51	04:25 21:20	04:51 21:03	05:41 20:07	06:34 18:55	07:27 18:13 (1)	17:55 (1)	07:24 16:02	15:44 (2) 15:35	08:02
22	07:50 16:16	06:56 17:15	15:55 (2) 18:07	16:56 (1) 19:58	04:44 20:52	04:25 21:21	04:52 21:02	05:43 20:05	06:35 18:52	07:28 18:13 (1)	17:55 (1)	07:25 16:04	15:45 (2) 15:37	08:02
23	07:49 16:18	06:54 17:17	15:58 (2) 18:08	16:57 (1) 19:58	04:43 20:54	04:26 21:21	04:54 21:01	05:44 20:03	06:37 18:50	07:30 18:13 (1)	17:55 (1)	07:27 16:02	15:46 (2) 15:37	08:03
24	07:48 16:19	06:52 17:19	16:02 (2) 18:10	16:57 (1) 19:58	04:42 20:55	04:26 21:21	04:55 20:59	05:46 20:00	06:39 18:47	07:32 18:13 (1)	17:55 (1)	07:29 16:04	15:47 (2) 15:38	08:03
25	07:46 16:21	06:49 17:21	16:09 (2) 18:12	16:57 (1) 19:58	04:41 20:57	04:26 21:21	04:57 20:58	05:48 19:58	06:41 18:45	07:34 18:11 (1)	17:55 (1)	07:31 16:02	15:48 (2) 15:38	08:04
26	07:45 16:23	06:47 17:22	16:10 (2) 18:14	16:58 (1) 19:58	04:40 20:58	04:27 21:21	04:58 20:56	05:49 19:56	06:42 18:42	07:36 18:11 (1)	17:55 (1)	07:32 16:04	15:49 (2) 15:39	08:04
27	07:44 16:25	06:45 17:24	16:11 (2) 18:16	16:59 (1) 19:58	04:39 20:59	04:28 21:21	04:59 20:55	05:51 19:54	06:44 18:40	07:38 18:10 (1)	17:55 (1)	07:34 16:02	15:50 (2) 15:43	08:04
28	07:42 16:27	06:43 17:26	16:12 (2) 18:17	16:59 (1) 19:58	04:37 20:59	04:28 21:21	05:01 20:53	05:53 19:51	06:46 18:38	07:41 (1) 18:08 (1)	17:55 (1)	07:35 16:04	15:51 (2) 15:42	08:04
29	07:41 16:29	06:41 17:26	16:13 (2) 18:18	16:59 (1) 19:58	04:36 20:59	04:28 21:21	05:03 20:52	05:55 19:49	06:47 18:35	07:42 (1) 18:07 (1)	17:55 (1)	07:37 16:02	15:52 (2) 15:41	08:04
30	07:39 16:31	06:39 17:26	16:14 (2) 18:19	16:59 (1) 19:58	04:35 20:59	04:29 21:20	05:04 20:50	05:56 19:47	06:49 18:33	07:44 (1) 18:08 (1)	17:55 (1)	07:39 16:04	15:53 (2) 15:42	08:05
31	07:38 16:32	06:38 17:27	16:15 (2) 18:20	16:59 (1) 19:58	04:34 20:59	04:29 21:20	05:06 20:48	05:58 19:45	06:49 18:32	07:45 (1) 18:09 (1)	17:55 (1)	07:40 16:02	15:54 (2) 15:43	08:05
Potential sun hours	254	275	367	481	418	490	505	507	457	382	449	392	157	238
Total, worst case														

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	(WTG causing flicker first time)
Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Pawlowo_Golancz_miasto_07102010

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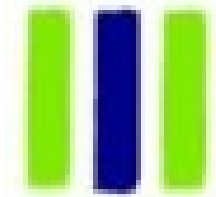
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** D - Shadow Receptor: 1.5 × 1.5 Azimuth: 38.1° Slope: 90.0° (6**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:05	07:36	06:41	06:28	05:20	04:33	04:29	05:08	06:00	06:51	06:47	07:40
	15:45	16:34	17:28	19:24	20:18	21:06	21:20	20:47	19:42	18:31	16:22	15:40
2	08:04	07:34	16:04 (7)	06:38	06:25	05:18	04:32	04:30	05:09	06:01	06:53	06:49
	15:46	16:36	16:06 (7)	17:30	19:26	20:19	21:07	21:20	20:45	19:40	18:28	16:20
3	08:04	07:33	16:04 (7)	06:36	06:23	05:16	04:31	04:31	05:11	06:03	06:54	06:51
	15:47	16:38	16:07 (7)	17:32	19:28	20:21	21:08	21:19	20:43	19:38	18:26	16:18
4	08:04	07:31	16:06 (7)	06:34	06:20	05:15	04:30	04:32	05:12	06:05	06:56	06:53
	15:48	16:40	16:10 (7)	17:34	19:30	20:23	21:09	21:19	20:41	19:35	18:23	16:16
5	08:04	07:29	16:07 (7)	06:31	06:18	05:13	04:30	04:33	05:14	06:07	06:58	06:55
	15:49	16:42	16:12 (7)	17:36	19:32	20:25	21:10	21:18	20:40	19:33	18:21	16:15
6	08:03	07:28	16:09 (7)	06:29	06:16	05:11	04:29	04:33	05:16	06:08	07:00	06:56
	15:51	16:44	16:13 (7)	17:37	19:33	20:26	21:11	21:18	20:38	19:31	18:19	16:13
7	08:03	07:26	16:13 (7)	06:27	06:13	05:09	04:28	04:34	05:17	06:10	07:01	06:58
	15:52	16:46	17:39	19:35	20:28	21:12	21:17	20:36	19:28	18:16	16:11	15:38 (7)
8	08:02	07:24	16:11	06:11	05:07	04:28	04:35	05:19	06:12	07:03	07:00	15:43 (7)
	15:53	16:48	17:41	19:37	20:30	21:13	21:17	20:34	19:26	18:14	16:09	15:37 (7)
9	08:02	07:22	16:11	06:09	05:05	04:27	04:36	05:21	06:13	07:05	07:02	15:42 (7)
	15:55	16:50	17:43	19:39	20:32	21:14	21:16	20:32	19:23	18:12	16:07	15:37 (7)
10	08:01	07:20	16:11	06:06	05:03	04:27	04:37	05:22	06:15	07:07	07:04	15:35 (7)
	15:56	16:52	17:45	19:41	20:33	21:15	21:15	20:30	19:21	18:09	16:06	15:35 (7)
11	08:01	07:18	16:11	06:04	05:02	04:26	04:38	05:24	06:17	07:09	07:06	15:35 (7)
	15:58	16:54	17:47	19:42	20:35	21:16	21:14	20:28	19:19	18:07	16:04	15:35 (7)
12	08:00	07:16	16:11	06:02	05:00	04:26	04:40	05:26	06:18	07:10	07:08	15:35 (7)
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13	07:59	07:14	16:11	05:59	04:58	04:26	04:41	05:27	06:20	07:12	07:09	15:35 (7)
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14	07:58	07:12	16:11	05:57	04:57	04:25	04:42	05:29	06:22	07:14	07:11	15:35 (7)
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15	07:58	07:10	16:11	05:55	04:55	04:25	04:43	05:31	06:24	07:16	07:13	15:35 (7)
	16:04	17:01	17:54	19:49	20:41	21:18	21:10	20:20	19:09	17:58	15:58	15:35 (7)
16	07:57	07:08	16:11	05:53	04:53	04:25	04:44	05:32	06:25	07:18	07:15	15:35 (7)
	16:06	17:03	17:56	19:51	20:43	21:19	21:09	20:18	19:07	17:56	15:56	15:35 (7)
17	07:56	15:32 (8)	07:06	06:03	05:50	04:52	04:25	04:46	05:34	06:27	07:19	15:35 (7)
	16:07	15:34 (8)	17:05	17:58	19:53	20:45	21:19	21:08	20:16	19:04	17:53	15:35 (7)
18	07:55	15:33 (8)	07:04	06:01	05:48	04:50	04:25	04:47	05:36	06:29	07:21	15:35 (7)
	16:09	15:35 (8)	17:07	17:59	19:55	20:46	21:20	21:07	20:14	19:02	17:51	15:35 (7)
19	07:54	15:34 (8)	07:02	05:59	05:46	04:49	04:25	04:48	05:38	06:30	07:23	15:35 (7)
	16:11	15:37 (8)	17:09	18:01	19:57	20:48	21:20	21:06	20:11	18:59	17:49	15:35 (7)
20	07:53	15:35 (8)	07:00	05:56	05:44	04:47	04:25	04:50	05:39	06:32	07:25	15:35 (7)
	16:12	15:39 (8)	17:11	18:03	19:58	20:49	21:20	21:05	20:09	18:57	17:47	15:35 (7)
21	07:51	15:36 (8)	06:58	05:54	05:42	04:46	04:25	04:51	05:41	06:34	07:27	15:35 (7)
	16:14	15:40 (8)	17:13	18:05	20:00	20:51	21:21	21:03	20:07	18:55	17:45	15:35 (7)
22	07:50	16:56	17:15	05:51	05:39	04:44	04:25	04:52	05:43	06:35	07:28	15:35 (7)
	16:16	17:15	18:07	20:02	20:52	21:21	21:02	20:05	18:52	17:43	15:48	15:35 (7)
23	07:49	06:54	17:17	05:49	05:37	04:43	04:26	04:54	05:44	06:37	07:30	15:35 (7)
	16:18	17:17	18:08	20:04	20:54	21:21	21:01	20:03	18:50	17:40	15:47	15:35 (7)
24	07:48	06:52	17:19	05:47	05:35	04:42	04:26	04:55	05:46	06:39	07:32	15:35 (7)
	16:19	17:19	18:10	20:05	20:55	21:21	20:59	20:00	18:47	17:38	15:46	15:35 (7)
25	07:46	06:49	17:21	05:44	05:33	04:41	04:26	04:57	05:48	06:41	07:31	15:35 (7)
	16:21	17:21	18:12	20:07	20:57	21:21	20:58	19:58	18:45	16:36	15:45	15:35 (7)
26	07:45	06:47	17:22	05:42	05:31	04:39	04:27	04:58	05:49	06:42	07:32	15:35 (7)
	16:23	17:22	18:14	20:09	20:58	21:21	20:56	19:56	18:42	16:34	15:44	15:35 (7)
27	07:44	06:45	17:24	05:39	05:29	04:38	04:27	05:00	05:51	06:44	07:34	15:35 (7)
	16:25	17:24	18:16	20:11	20:59	21:21	20:55	19:54	18:40	16:32	15:43	15:35 (7)
28	07:42	06:43	17:26	05:37	05:27	04:37	04:28	05:01	05:53	06:46	07:35	15:35 (7)
	16:27	17:26	18:17	20:12	21:01	21:21	20:53	19:51	18:38	16:30	15:42	15:35 (7)
29	07:41	16:29	18:19	05:35	05:25	04:36	04:28	05:03	05:55	06:47	07:37	15:35 (7)
	16:31	17:30	18:21	20:14	21:02	21:21	20:52	19:49	18:35	16:28	15:41	15:35 (7)
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	16:31	17:31	18:22	20:16	21:03	21:20	20:50	19:47	18:33	16:26	15:40	15:35 (7)
31	07:38	16:30	18:23	06:30	06:20	04:34	04:26	05:06	05:58	06:45	07:38	15:35 (7)
	16:32	17:32	18:24	20:17	21:05	21:22	20:48	19:45	18:31	16:24	15:43	15:35 (7)
Potential sun hours	254	275	367	418	490	505	507	457	382	330	262	238
Total, worst case	15	18	367	418	490	505	507	457	382	330	262	238

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Pawlowo_Golancz_miasto_07102010

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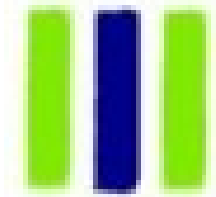
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** E - Shadow Receptor: 1.5 × 1.5 Azimuth: 38.1° Slope: 90.0° (P)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:05	07:36	06:41	06:28	05:20	04:33	04:29	05:08	06:00	06:51	06:47	07:40
	15:45	16:34	17:28	19:24	20:18	21:06	21:20	20:47	19:42	18:31	16:22	15:40
2	08:04	07:34	16:04 (7)	06:38	06:25	05:18	04:32	04:30	05:09	06:01	06:53	06:49
	15:46	16:36	16:06 (7)	17:30	19:26	20:19	21:07	21:20	20:45	19:40	18:28	16:20
3	08:04	07:33	16:05 (7)	06:36	06:23	05:16	04:31	04:31	05:11	06:03	06:54	06:51
	15:47	16:38	16:07 (7)	17:32	19:28	20:21	21:08	21:19	20:43	19:38	18:26	16:18
4	08:04	07:31	16:06 (7)	06:34	06:20	05:15	04:30	04:32	05:12	06:05	06:56	06:53
	15:48	16:40	16:10 (7)	17:34	19:30	20:23	21:09	21:19	20:41	19:35	18:23	16:16
5	08:04	07:29	16:07 (7)	06:31	06:18	05:13	04:30	04:33	05:14	06:07	06:58	06:55
	15:49	16:42	16:12 (7)	17:36	19:32	20:25	21:10	21:18	20:40	19:33	18:21	16:15
6	08:03	07:28	06:29	06:16	05:11	04:29	04:33	05:16	06:08	07:00	06:56	15:40 (7)
	15:51	16:44	17:37	19:33	20:26	21:11	21:18	20:38	19:31	18:19	16:13	15:37 (7)
7	08:03	07:26	06:27	06:13	05:09	04:28	04:34	05:17	06:10	07:01	06:58	15:42 (7)
	15:52	16:46	17:39	19:35	20:28	21:12	21:17	20:36	19:28	18:16	16:11	15:37 (7)
8	08:02	07:24	06:25	06:11	05:07	04:28	04:35	05:19	06:12	07:03	07:00	15:40 (7)
	15:53	16:48	17:41	19:37	20:30	21:13	21:17	20:34	19:26	18:14	16:09	15:36 (7)
9	08:02	07:22	06:22	06:09	05:05	04:27	04:36	05:21	06:13	07:05	07:02	15:38 (7)
	15:55	16:50	17:43	19:39	20:32	21:14	21:16	20:32	19:23	18:12	16:07	15:35 (7)
10	08:01	07:20	06:20	06:06	05:03	04:27	04:37	05:22	06:15	07:07	07:04	15:37 (7)
	15:56	16:52	17:45	19:41	20:33	21:15	21:15	20:30	19:21	18:09	16:06	15:35
11	08:01	07:18	06:18	06:04	05:02	04:26	04:38	05:24	06:17	07:09	07:06	15:35 (7)
	15:58	16:54	17:47	19:42	20:35	21:16	21:14	20:28	19:19	18:07	16:04	15:35
12	08:00	07:16	06:15	06:02	05:00	04:26	04:40	05:26	06:18	07:10	07:08	15:35
	15:59	16:56	17:49	19:44	20:37	21:16	21:13	20:26	19:16	18:05	16:03	15:35
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	16:01	16:58	17:50	19:46	20:38	21:17	21:12	20:24	19:14	18:02	16:01	15:35
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	16:04	17:01	17:54	19:49	20:41	21:18	21:10	20:20	19:09	17:58	15:58	15:35
16	07:57	07:08	06:06	05:53	04:53	04:25	04:44	05:32	06:25	07:18	07:15	15:35
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17	07:56	15:32 (8)	06:03	05:50	04:52	04:25	04:46	05:34	06:27	07:19	07:17	15:35
	16:07	15:34 (8)	17:58	19:53	20:45	21:19	21:08	20:16	19:04	17:53	15:55	15:35
18	07:55	15:33 (8)	06:01	05:48	04:50	04:25	04:47	05:36	06:29	07:21	07:18	15:35
	16:09	15:35 (8)	17:59	19:55	20:46	21:20	21:07	20:14	19:02	17:51	15:54	15:35
19	07:54	15:34 (8)	05:59	05:46	04:49	04:25	04:48	05:38	06:30	07:23	07:20	15:35
	16:11	15:37 (8)	18:01	19:57	20:48	21:20	21:06	20:11	18:59	17:49	15:52	15:35
20	07:53	15:35 (8)	05:56	05:44	04:47	04:25	04:50	05:39	06:32	07:25	07:22	15:35
	16:12	15:39 (8)	18:03	19:58	20:49	21:20	21:05	20:09	18:57	17:47	15:51	15:35
21	07:51	15:37 (8)	05:54	05:42	04:46	04:25	04:51	05:41	06:34	07:27	07:24	15:35
	16:14	15:40 (8)	18:05	20:00	20:51	21:21	21:03	20:07	18:55	17:45	15:50	15:35
22	07:50	06:56	05:51	05:39	04:44	04:25	04:52	05:43	06:35	07:28	07:26	15:35
	16:16	17:15	18:07	20:02	20:52	21:21	21:02	20:05	18:52	17:43	15:48	15:35
23	07:49	06:54	05:49	05:37	04:43	04:26	04:54	05:44	06:37	07:30	07:27	15:35
	16:18	17:17	18:08	20:04	20:54	21:21	21:01	20:03	18:50	17:40	15:47	15:35
24	07:48	06:52	05:47	05:35	04:42	04:26	04:55	05:46	06:39	07:32	07:29	15:35
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	16:21	17:21	18:12	20:07	20:57	21:21	20:58	19:58	18:45	16:36	15:45	15:35
26	07:45	06:47	05:42	05:31	04:39	04:27	04:58	05:49	06:42	07:36	07:32	15:35
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	16:27	17:26	18:17	20:12	21:01	21:21	20:53	19:51	18:38	16:30	15:42	15:35
29	07:41		06:35	05:25	04:36	04:28	05:03	05:55	06:47	07:41	07:37	15:35
	16:29		19:19	20:14	21:02	21:21	20:52	19:49	18:35	16:28	15:41	15:35
30	07:39		06:32	05:22	04:35	04:29	05:04	05:56	06:49	07:43	07:39	15:35
	16:31		19:21	20:16	21:03	21:20	20:50	19:47	18:33	16:26	15:40	15:35
31	07:38		06:30		04:34		05:06	05:58		06:45		15:35
	16:32		19:23		21:05		20:48	19:45		16:24		15:43
Potential sun hours	254	275	367	418	490	505	507	457	382	330	262	238
Total, worst case	14	13									30	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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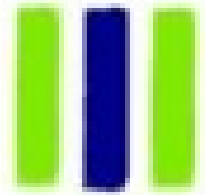
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** F - Shadow Receptor: 1.5 × 1.5 Azimuth: 38.1° Slope: 90.0° (6**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:05 15:45	07:36 16:34	06:41 17:28	06:28 19:24	05:20 20:18	04:33 21:06	04:29 21:20	05:08 20:47	06:00 19:42	06:51 18:31	06:47 16:22	07:40 15:40		
2	08:04 15:46	07:34 16:36	06:38 17:30	06:25 19:26	05:18 20:19	04:32 21:07	04:30 21:20	05:09 20:45	06:01 19:40	06:53 18:28	06:49 16:20	07:42 15:39		
3	08:04 15:47	07:33 16:38	16:05 (7) 16:07 (7)	06:36 17:32	06:23 19:28	05:16 20:21	04:31 21:08	04:31 21:19	05:11 20:43	06:03 19:38	06:54 18:26	06:51 16:18	07:43 15:38	
4	08:04 15:48	07:31 16:40	16:07 (7) 16:10 (7)	06:34 17:34	06:20 19:30	05:15 20:23	04:30 21:09	04:32 21:19	05:12 20:41	06:05 19:35	06:56 18:23	06:53 16:16	07:44 15:38	
5	08:04 15:49	07:29 16:42	16:08 (7) 16:12 (7)	06:31 17:36	06:18 19:32	05:13 20:25	04:30 21:10	04:33 21:18	05:14 20:40	06:07 19:33	06:58 18:21	06:55 16:15	07:46 15:37	
6	08:03 15:51	07:28 16:44		06:29 17:37	06:16 19:33	05:11 20:26	04:29 21:11	04:33 21:18	05:16 20:38	06:08 19:31	07:00 18:19	06:56 16:13	15:38 (7) 15:42 (7)	07:47 15:37
7	08:03 15:52	07:26 16:46		06:27 17:39	06:13 19:35	05:09 20:28	04:28 21:12	04:34 21:17	05:17 20:36	06:10 19:28	07:01 18:16	06:58 16:11	15:36 (7) 15:40 (7)	07:48 15:36
8	08:02 15:53	07:24 16:48		06:25 17:41	06:11 19:37	05:07 20:30	04:28 21:13	04:35 21:17	05:19 20:34	06:12 19:26	07:03 18:14	07:00 16:09	15:36 (7) 15:38 (7)	07:50 15:36
9	08:02 15:55	07:22 16:50		06:22 17:43	06:09 19:39	05:05 20:32	04:27 21:14	04:36 21:16	05:21 20:32	06:13 19:23	07:05 18:12	07:02 16:07	15:35 (7) 15:37 (7)	07:51 15:35
10	08:01 15:56	07:20 16:52		06:20 17:45	06:06 19:41	05:03 20:33	04:27 21:15	04:37 21:15	05:22 20:30	06:15 19:21	07:07 18:09	07:04 16:06	07:52 15:35	07:52 15:35
11	08:01 15:58	07:18 16:54		06:18 17:47	06:04 19:42	05:02 20:35	04:26 21:16	04:38 21:14	05:24 20:28	06:17 19:19	07:09 18:07	07:06 16:04	07:53 15:35	07:53 15:35
12	08:00 15:59	07:16 16:56		06:15 17:49	06:02 19:44	05:00 20:37	04:26 21:16	04:40 21:13	05:26 20:26	06:18 19:16	07:10 18:05	07:08 16:03	07:54 15:35	07:54 15:35
13	07:59 16:01	07:14 16:58		06:13 17:50	05:59 19:46	04:58 20:38	04:26 21:17	04:41 21:12	05:27 20:24	06:20 19:14	07:12 18:02	07:09 16:01	07:55 15:35	07:55 15:35
14	07:58 16:02	07:12 17:00		06:10 17:52	05:57 19:48	04:57 20:40	04:25 21:18	04:42 21:11	05:29 20:22	06:22 19:11	07:14 18:00	07:11 15:59	07:56 15:35	07:56 15:35
15	07:58 16:04	07:10 17:01		06:08 17:54	05:55 19:49	04:55 20:41	04:25 21:18	04:43 21:10	05:31 20:20	06:24 19:09	07:16 17:58	07:13 15:58	07:57 15:35	07:57 15:35
16	07:57 16:06	07:08 17:03		06:06 17:56	05:53 19:51	04:53 20:43	04:25 21:19	04:44 21:09	05:32 20:18	06:25 19:07	07:18 17:56	07:15 15:56	07:58 15:35	07:58 15:35
17	07:56 16:07	15:32 (8) 15:34 (8)	07:06 17:05	06:03 17:58	05:50 19:53	04:52 20:45	04:25 21:19	04:46 21:08	05:34 20:16	06:27 19:04	07:19 17:53	07:17 15:55	07:59 15:35	07:59 15:35
18	07:55 16:09	15:33 (8) 15:35 (8)	07:04 17:07	06:01 17:59	05:48 19:55	04:50 20:46	04:25 21:20	04:47 21:07	05:36 20:14	06:29 19:02	07:21 17:51	07:18 15:54	08:00 15:35	08:00 15:35
19	07:54 16:11	15:34 (8) 15:37 (8)	07:02 17:09	05:59 18:01	05:46 19:57	04:49 20:48	04:25 21:20	04:48 21:06	05:38 20:11	06:30 18:59	07:23 17:49	07:20 15:52	08:00 15:35	08:00 15:35
20	07:53 16:12	15:36 (8) 15:39 (8)	07:00 17:11	05:56 18:03	05:44 19:58	04:47 20:49	04:25 21:20	04:50 21:05	05:39 20:09	06:32 18:57	07:25 17:47	07:22 15:51	08:01 15:36	08:01 15:36
21	07:51 16:14	15:38 (8) 15:40 (8)	06:58 17:13	05:54 18:05	05:42 20:00	04:46 20:51	04:25 21:21	04:51 21:03	05:41 20:07	06:34 18:55	07:27 17:45	07:24 15:50	15:14 (8) 15:16 (8)	08:02 15:36
22	07:50 16:16	06:56 17:15		05:51 18:07	05:39 20:02	04:44 20:52	04:25 21:21	04:52 21:02	05:43 20:05	06:35 18:52	07:28 17:43	07:26 15:48	15:12 (8) 15:15 (8)	08:02 15:37
23	07:49 16:18	06:54 17:17		05:49 18:08	05:37 20:04	04:43 20:54	04:26 21:21	04:54 21:01	05:44 20:03	06:37 18:50	07:30 17:40	07:27 15:47	15:12 (8) 15:14 (8)	08:03 15:37
24	07:48 16:19	06:52 17:19		05:47 18:10	05:35 20:05	04:42 20:55	04:26 21:21	04:55 20:59	05:46 20:00	06:39 18:47	07:32 17:38	07:29 15:46	15:11 (8) 15:13 (8)	08:03 15:38
25	07:46 16:21	06:49 17:21		05:44 18:12	05:33 20:07	04:41 20:57	04:26 21:21	04:57 20:58	05:48 19:58	06:41 18:45	07:34 17:36	07:31 15:45	15:10 (8) 15:12 (8)	08:04 15:38
26	07:45 16:23	06:47 17:22		05:42 18:14	05:31 20:09	04:39 20:58	04:27 21:21	04:58 20:56	05:49 19:56	06:42 18:42	07:36 17:34	07:32 15:44		08:04 15:39
27	07:44 16:25	06:45 17:24		05:39 18:16	05:29 20:11	04:38 20:59	04:27 21:21	05:00 20:55	05:51 19:54	06:44 18:40	07:38 17:32	07:34 15:43		08:04 15:40
28	07:42 16:27	06:43 17:26		05:37 18:17	05:27 20:12	04:37 21:01	04:28 21:21	05:01 20:53	05:53 19:51	06:46 18:38	07:40 17:30	07:35 15:42		08:04 15:41
29	07:41 16:29			06:35 19:19	05:25 20:14	04:36 21:02	04:28 21:21	05:03 20:52	05:55 19:49	06:47 18:35	07:41 17:28	07:37 15:41		08:04 15:42
30	07:39 16:31			06:32 19:21	05:22 20:16	04:35 21:03	04:29 21:20	05:04 20:50	05:56 19:47	06:49 18:33	07:43 17:26	07:39 15:40		08:05 15:42
31	07:38 16:32			06:30 19:23		04:34 21:05		05:06 20:48	05:58 19:45		06:45 16:24			08:05 15:43
Potential sun hours	254	275		367	418	490	505	507	457	382	330	262		238
Total, worst case	12	9										23		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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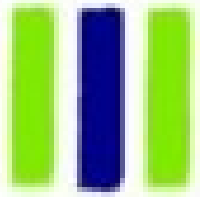
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** G - Shadow Receptor: 1.5 × 1.5 Azimuth: 38.1° Slope: 90.0°**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:05	07:36	06:41	06:28	05:20	04:33	04:29	05:08	06:00	06:51	06:47	07:40
	15:45	16:34	17:28	19:24	20:18	21:06	21:20	20:47	19:42	18:31	16:22	15:40
2	08:04	07:34	06:38	06:25	05:18	04:32	04:30	05:09	06:01	06:53	06:49	07:42
	15:46	16:36	17:30	19:26	20:19	21:07	21:20	20:45	19:40	18:28	16:20	15:39
3	08:04	07:33	16:05 (7)	06:36	06:23	05:16	04:31	05:11	06:03	06:54	06:51	07:43
	15:47	16:38	2	16:07 (7)	17:32	19:28	20:21	21:08	19:38	18:26	16:18	15:38
4	08:04	07:31	16:07 (7)	06:34	06:20	05:15	04:30	05:12	06:05	06:56	06:53	07:44
	15:48	16:40	3	16:10 (7)	17:34	19:30	20:23	21:09	19:35	18:23	16:16	15:38
5	08:04	07:29	16:09 (7)	06:31	06:18	05:13	04:30	05:14	06:07	06:58	06:55	07:46
	15:49	16:42	3	16:12 (7)	17:36	19:32	20:25	21:10	19:33	18:21	16:15	15:37
6	08:03	07:28		06:29	06:16	05:11	04:29	05:16	06:08	07:00	06:56	15:39 (7)
	15:51	16:44		17:37	19:33	20:26	21:11	21:18	19:31	18:19	16:13	3
7	08:03	07:26		06:27	06:13	05:09	04:28	05:17	06:10	07:01	06:58	15:37 (7)
	15:52	16:46		17:39	19:35	20:28	21:12	21:17	19:28	18:16	16:11	3
8	08:02	07:24		06:25	06:11	05:07	04:28	05:19	06:12	07:03	07:00	15:36 (7)
	15:53	16:48		17:41	19:37	20:30	21:13	21:17	19:26	18:14	16:09	2
9	08:02	07:22		06:22	06:09	05:05	04:27	05:21	06:13	07:05	07:02	15:35 (7)
	15:55	16:50		17:43	19:39	20:32	21:14	21:16	19:23	18:12	16:07	2
10	08:01	07:20		06:20	06:06	05:03	04:27	05:22	06:15	07:07	07:04	15:35 (7)
	15:56	16:52		17:45	19:41	20:33	21:15	21:15	19:21	18:09	16:06	15:35
11	08:01	07:18		06:18	06:04	05:02	04:26	05:24	06:17	07:09	07:06	15:35 (7)
	15:58	16:54		17:47	19:42	20:35	21:16	21:14	19:19	18:07	16:04	15:35
12	08:00	07:16		06:15	06:02	05:00	04:26	05:26	06:18	07:10	07:08	15:35
	15:59	16:56		17:49	19:44	20:37	21:16	21:13	19:16	18:05	16:03	15:35
13	07:59	07:14		06:13	05:59	04:58	04:26	05:27	06:20	07:12	07:09	15:35
	16:01	16:58		17:50	19:46	20:38	21:17	21:12	19:14	18:02	16:01	15:35
14	07:58	07:12		06:10	05:57	04:57	04:25	05:29	06:22	07:14	07:11	15:35
	16:02	17:00		17:52	19:48	20:40	21:18	21:11	19:11	18:00	15:59	15:35
15	07:58	07:10		06:08	05:55	04:55	04:25	05:31	06:24	07:16	07:13	15:35
	16:04	17:01		17:54	19:49	20:41	21:18	21:10	19:09	17:58	15:58	15:35
16	07:57	07:08		06:06	05:53	04:53	04:25	05:32	06:25	07:18	07:15	15:35
	16:06	17:03		17:56	19:51	20:43	21:19	21:09	19:07	17:56	15:56	15:35
17	07:56	15:32 (8)	07:06	06:03	05:50	04:52	04:25	05:34	06:27	07:19	07:17	15:35
	16:07	2	15:34 (8)	17:05	17:58	19:53	20:45	21:19	21:08	19:04	17:53	15:55
18	07:55	15:33 (8)	07:04	06:01	05:48	04:50	04:25	05:36	06:29	07:21	07:18	15:35
	16:09	2	15:35 (8)	17:07	17:59	19:55	20:46	21:20	21:07	19:02	17:51	15:54
19	07:54	15:35 (8)	07:02	05:59	05:46	04:49	04:25	05:38	06:30	07:23	07:20	15:35
	16:11	2	15:37 (8)	17:09	18:01	19:57	20:48	21:20	21:06	19:01	17:49	15:52
20	07:53	15:37 (8)	07:00	05:56	05:44	04:47	04:25	05:39	06:32	07:25	07:22	15:35
	16:12	2	15:39 (8)	17:11	18:03	19:58	20:49	21:20	21:05	19:00	17:47	15:51
21	07:51		06:58	05:54	05:42	04:46	04:25	05:41	06:34	07:27	07:24	15:36
	16:14		17:13	18:05	20:00	20:51	21:21	21:03	20:07	18:55	17:45	15:50
22	07:50		06:56	05:51	05:39	04:44	04:25	05:43	06:35	07:28	07:26	15:13 (8)
	16:16		17:15	18:07	20:02	20:52	21:21	21:02	20:05	18:52	17:43	2
23	07:49		06:54	05:49	05:37	04:43	04:26	05:44	06:37	07:30	07:27	15:12 (8)
	16:18		17:17	18:08	20:04	20:54	21:21	21:01	20:03	18:50	17:40	2
24	07:48		06:52	05:47	05:35	04:42	04:26	05:45	06:39	07:32	07:29	15:11 (8)
	16:19		17:19	18:10	20:05	20:55	21:21	20:59	20:00	18:47	17:38	2
25	07:46		06:49	05:44	05:33	04:41	04:26	05:47	06:41	07:34	07:31	15:10 (8)
	16:21		17:21	18:12	20:07	20:57	21:21	20:58	19:58	18:45	16:36	2
26	07:45		06:47	05:42	05:31	04:39	04:27	05:48	06:42	07:36	07:32	15:12 (8)
	16:23		17:22	18:14	20:09	20:58	21:21	20:56	19:56	18:42	16:34	15:44
27	07:44		06:45	05:39	05:29	04:38	04:27	05:00	05:51	06:44	06:38	15:43
	16:25		17:24	18:16	20:11	20:59	21:21	20:55	19:54	18:40	16:32	15:43
28	07:42		06:43	05:37	05:27	04:37	04:28	05:01	05:53	06:46	06:40	15:43
	16:27		17:26	18:17	20:12	21:01	21:21	20:53	19:51	18:38	16:30	15:42
29	07:41			06:35	05:25	04:36	04:28	05:03	05:55	06:47	06:41	15:41
	16:29			19:19	20:14	21:02	21:21	20:52	19:49	18:35	16:28	15:41
30	07:39			06:32	05:22	04:35	04:29	05:04	05:56	06:49	06:43	15:41
	16:31			19:21	20:16	21:03	21:20	20:50	19:47	18:33	16:26	15:40
31	07:38			06:30		04:34		05:06	05:58		06:45	15:40
	16:32			19:23		21:05		20:48	19:45		16:24	15:43
Potential sun hours	254	275	367	418	490	505	507	457	382	330	262	238
Total, worst case	8	8									18	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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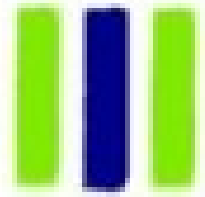
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** H - Shadow Receptor: 1.5 × 1.5 Azimuth: -102.8° Slope: 90.0° (8)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June
1	08:05 15:45	07:36 16:34	06:41 17:28	07:04 (6) 07:09 (6)	06:28 19:25	05:21 20:18
2	08:04 15:46	07:34 16:36	06:38 17:30	07:02 (6) 07:08 (6)	06:25 19:26	05:19 20:19
3	08:04 15:47	07:33 16:38	06:36 17:32	07:00 (6) 07:08 (6)	06:23 19:28	05:17 20:21
4	08:04 15:48	07:31 16:40	06:34 17:34	07:00 (6) 07:06 (6)	06:21 19:30	05:15 20:23
5	08:04 15:50	07:29 16:42	06:31 17:36	06:18 19:32	05:13 20:25	05:13 20:27
6	08:03 15:51	07:28 16:44	06:29 17:38	06:16 19:33	05:11 20:26	05:11 20:27
7	08:03 15:52	07:26 16:46	06:27 17:39	06:13 19:35	05:09 20:28	05:09 20:27
8	08:02 15:53	07:24 16:48	06:25 17:41	06:11 19:37	05:07 20:30	05:07 20:27
9	08:02 15:55	07:22 16:50	06:22 17:43	06:09 19:39	05:05 20:32	05:05 20:27
10	08:01 15:56	07:20 16:52	06:20 17:45	06:06 19:41	05:03 20:33	05:03 20:28
11	08:01 15:58	07:18 16:54	06:18 17:47	06:04 19:42	05:02 20:35	05:02 20:28
12	08:00 15:59	07:16 16:56	06:15 17:49	06:02 19:44	05:00 20:37	05:00 20:28
13	07:59 16:01	07:14 16:58	06:13 17:50	06:00 19:46	04:58 20:38	04:58 20:27
14	07:58 16:02	07:12 17:00	06:10 17:52	05:57 19:48	04:57 20:40	04:57 20:27
15	07:58 16:04	07:10 17:02	06:08 17:54	05:55 19:49	04:55 20:41	04:55 20:26
16	07:57 16:06	07:08 17:03	06:06 17:56	05:53 19:51	04:53 20:43	04:53 20:27
17	07:56 16:07	07:06 17:05	06:03 17:58	05:50 19:53	04:52 20:45	04:52 20:27
18	07:55 16:09	07:04 17:07	06:01 17:59	05:48 19:55	04:50 20:46	04:50 20:27
19	07:54 16:11	07:02 17:09	05:59 18:01	05:46 19:57	04:49 20:48	04:49 20:27
20	07:53 16:12	07:00 17:11	05:56 18:03	05:44 19:58	04:47 20:49	04:47 20:26
21	07:51 16:14	06:58 17:13	05:54 18:05	05:42 20:00	04:46 20:51	04:46 20:26
22	07:50 16:16	06:56 17:15	05:51 18:07	05:39 20:02	04:45 20:52	04:45 20:26
23	07:49 16:18	06:54 17:17	05:49 18:08	05:37 20:04	04:43 20:54	04:43 20:27
24	07:48 16:19	06:52 17:19	05:47 18:10	05:35 20:05	04:42 20:55	04:42 20:27
25	07:46 16:21	06:49 17:21	05:44 18:12	05:33 20:07	04:41 20:57	04:41 20:27
26	07:45 16:23	06:47 17:23	05:42 18:14	05:31 20:09	04:39 20:58	04:39 20:27
27	07:44 16:25	06:45 17:24	05:40 18:16	05:29 20:11	04:38 20:59	04:38 20:27
28	07:42 16:27	06:43 17:26	05:37 18:17	05:27 20:12	04:37 21:01	04:37 20:27
29	07:41 16:29	06:41 17:28	05:35 18:19	05:25 20:14	04:36 21:02	04:36 20:27
30	07:39 16:31	06:39 17:30	05:33 18:21	05:23 20:16	04:35 21:03	04:35 20:27
31	07:38 16:33	06:38 17:32	05:32 18:23	05:22 20:18	04:34 21:04	04:34 20:27
Potential sun hours	254	275	367	418	490	505
Total, worst case		2	170	118	250	808

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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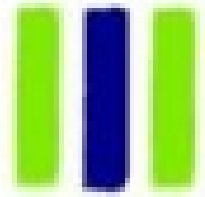
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** H - Shadow Receptor: 1.5 × 1.5 Azimuth: -102.8° Slope: 90.0° (8)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	July	August	September	October	November	December
1	04:30	05:12 (2)	05:08	06:00	06:27 (3)	06:51
	21:20	27	05:39 (2)	20:47	19:42	15
2	04:30	05:13 (2)	05:09	06:01	06:28 (3)	06:53
	21:20	27	05:40 (2)	20:45	19:40	13
3	04:31	05:13 (2)	05:11	06:03	06:30 (3)	06:54
	21:19	27	05:40 (2)	20:43	19:38	10
4	04:32	05:13 (2)	05:13	06:05	06:31 (3)	06:56
	21:19	28	05:41 (2)	20:41	19:35	8
5	04:33	05:13 (2)	05:14	06:07	06:33 (3)	06:58
	21:18	27	05:40 (2)	20:39	19:33	5
6	04:33	05:13 (2)	05:16	06:08	06:35 (3)	07:00
	21:18	27	05:40 (2)	20:38	19:31	2
7	04:34	05:13 (2)	05:17	06:10	07:01	07:01
	21:17	28	05:41 (2)	20:36	19:28	
8	04:35	05:14 (2)	05:19	06:12	07:03	07:00
	21:17	27	05:41 (2)	20:34	19:26	
9	04:36	05:14 (2)	05:21	06:13	07:05	07:36 (6)
	21:16	27	05:41 (2)	20:32	19:23	2
10	04:37	05:14 (2)	05:22	06:15	07:07	07:33 (6)
	21:15	27	05:41 (2)	20:30	19:21	8
11	04:39	05:15 (2)	05:24	06:17	07:09	07:35 (6)
	21:14	26	05:41 (2)	20:28	19:19	7
12	04:40	05:15 (2)	05:26	06:18	07:10	07:37 (6)
	21:13	26	05:41 (2)	20:26	19:16	6
13	04:41	05:15 (2)	05:28	06:20	07:12	07:39 (6)
	21:12	26	05:41 (2)	20:24	19:14	4
14	04:42	05:15 (2)	05:29	06:22	07:14	07:40 (6)
	21:11	26	05:41 (2)	20:22	19:11	2
15	04:43	05:16 (2)	05:31	06:24	06:58 (4)	07:16
	21:10	24	05:40 (2)	20:20	19:09	9
16	04:44	05:17 (2)	05:33	06:25	06:56 (4)	07:18
	21:09	24	05:41 (2)	20:18	19:07	12
17	04:46	05:17 (2)	05:34	06:27	06:55 (4)	07:19
	21:08	23	05:40 (2)	20:16	19:04	14
18	04:47	05:18 (2)	05:36	06:29	06:55 (4)	07:21
	21:07	22	05:40 (2)	20:14	19:02	14
19	04:48	05:19 (2)	05:38	06:30	06:56 (4)	07:23
	21:06	20	05:39 (2)	20:11	18:59	12
20	04:50	05:21 (2)	05:39	06:32	06:58 (4)	07:25
	21:05	18	05:39 (2)	20:09	18:57	10
21	04:51	05:22 (2)	05:41	06:34	07:00 (4)	07:27
	21:03	16	05:38 (2)	20:07	18:55	7
22	04:53	05:23 (2)	05:43	06:35	07:01 (4)	07:28
	21:02	14	05:37 (2)	20:05	18:52	4
23	04:54	05:25 (2)	05:44	06:37	07:05 (4)	07:43
	21:01	11	05:36 (2)	20:03	18:50	
24	04:55	05:26 (2)	05:46	06:39	07:32	07:32
	20:59	8	05:34 (2)	20:00	18:47	
25	04:57	05:27 (2)	05:48	06:41	06:34	07:31
	20:58	4	05:31 (2)	19:58	18:45	
26	04:58		05:50	06:42	06:36	07:32
	20:56		19:56	18:43	16:34	15:44
27	05:00		05:51	06:44	06:38	07:34
	20:55		19:54	8	06:38 (3)	18:40
28	05:01		05:53	06:46	06:40	07:35
	20:53		19:51	12	06:40 (3)	18:38
29	05:03		05:55	06:48	06:41	07:37
	20:52		19:49	14	06:41 (3)	18:35
30	05:05		05:56	06:49	06:43	07:39
	20:50		19:47	15	06:41 (3)	18:33
31	05:06		05:58	06:45	06:45	
	20:48		19:45	17	06:42 (3)	
Potential sun hours	507	457	382	330	263	238
Total, worst case	560	66	137	85		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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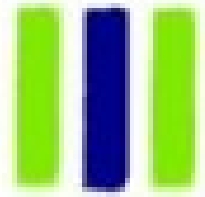
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** I - Shadow Receptor: 1.5 × 1.5 Azimuth: -102.8° Slope: 90.0°**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March		April		May	June	July	August		September		October		November	December		
1	08:05 15:45	07:36 16:34	06:41 17:28		06:28 19:24	18	06:51 (4) 07:09 (4)	05:21 20:18	04:33 21:06	04:30 21:20	05:08 20:47	06:00 19:42		06:51 18:31	11	07:17 (5) 07:28 (5)	06:47 16:22	07:40 15:40	
2	08:04 15:46	07:34 16:36	06:38 17:30	3	07:02 (6) 07:05 (6)	06:25 19:26	18	06:50 (4) 07:08 (4)	05:19 20:19	04:32 21:07	04:30 21:20	05:09 20:45	06:01 19:40	06:53 18:28	8	07:27 (5) 07:25 (5)	06:49 16:20	07:42 15:39	
3	08:04 15:47	07:33 16:38	06:36 17:32	6	07:00 (6) 07:06 (6)	06:23 19:28	16	06:51 (4) 07:07 (4)	05:17 20:21	04:31 21:08	04:31 21:19	05:11 20:43	06:03 19:38	06:54 18:26	5	07:20 (5) 07:22 (5)	06:51 16:18	07:43 15:38	
4	08:04 15:48	07:31 16:40	06:34 17:34	8	06:57 (6) 07:05 (6)	06:21 19:30	14	06:52 (4) 07:06 (4)	05:15 20:23	04:31 21:09	04:32 21:19	05:13 20:41	06:05 19:35	06:56 18:23	2	07:24 (5) 07:24 (5)	06:53 16:16	07:44 15:38	
5	08:04 15:50	07:29 16:42	06:31 17:36	10	06:55 (6) 07:05 (6)	06:18 19:32	12	06:52 (4) 07:04 (4)	05:13 20:25	04:30 21:10	04:33 21:18	05:14 20:39	06:07 19:33	06:58 18:21		06:55 16:15	07:46 15:37		
6	08:03 15:51	07:28 16:44	06:29 17:38	11	06:53 (6) 07:04 (6)	06:16 19:33	6	06:55 (4) 07:01 (4)	05:11 20:26	04:29 21:11	04:33 21:18	05:16 20:38	06:08 19:31	6	06:51 (4) 06:57 (4)	07:00 18:19	06:56 16:13	07:47 15:37	
7	08:03 15:52	07:26 16:46	06:27 17:39	8	06:54 (6) 07:02 (6)	06:13 19:35		05:09 20:28	04:29 21:12	04:34 21:17	05:17 20:36	06:10 19:28	11	06:48 (4) 06:59 (4)	07:01 18:16	10	07:30 (6) 07:40 (6)	06:58 16:11	07:48 15:36
8	08:02 15:53	07:24 16:48	06:25 17:41		06:11 19:37			05:07 20:30	04:28 21:13	04:35 21:17	05:19 20:34	06:12 19:26	14	06:46 (4) 07:00 (4)	07:03 18:14	11	07:29 (6) 07:40 (6)	07:50 16:09	07:50 15:36
9	08:02 15:55	07:22 16:50	06:22 17:43		06:09 19:39			05:05 20:32	04:27 21:14	04:36 21:16	05:21 20:32	06:13 19:23	16	06:45 (4) 07:01 (4)	07:05 18:12	9	07:31 (6) 07:40 (6)	07:02 16:08	07:51 15:36
10	08:01 15:56	07:20 16:52	06:20 17:45	4	06:43 (5) 06:47 (5)	06:06 19:41		05:03 20:33	04:27 21:15	04:37 21:15	05:22 20:30	06:15 19:21	17	06:44 (4) 07:01 (4)	07:07 18:09	7	07:33 (6) 07:43 (6)	07:04 16:06	07:52 15:35
11	08:01 15:58	07:18 16:54	06:18 17:47	7	06:41 (5) 06:48 (5)	06:04 19:42		05:02 20:35	04:27 21:15	04:39 21:14	05:24 20:28	06:17 19:19	18	06:43 (4) 07:01 (4)	07:07 18:10	5	07:35 (6) 07:40 (6)	07:06 16:04	07:53 15:35
12	08:00 15:59	07:16 16:56	06:15 17:49	10	06:39 (5) 06:49 (5)	06:02 19:44		05:00 20:37	04:26 21:16	04:40 21:13	05:26 20:26	06:18 19:16	18	06:45 (4) 07:01 (4)	07:09 18:05	5	07:40 (6) 07:37 (6)	07:08 16:03	07:54 15:35
13	07:59 16:01	07:14 16:58	06:13 17:50	12	06:36 (5) 06:48 (5)	06:00 19:46		04:58 20:38	04:26 21:17	04:41 21:12	05:27 20:24	6	06:18 (3) 06:21 (3)	06:20 19:14		06:46 (4) 07:00 (4)	07:12 18:03	07:09 16:01	07:55 15:35
14	07:58 16:02	07:12 17:00	06:10 17:52	14	06:34 (5) 06:48 (5)	05:57 19:48		04:57 20:40	04:26 21:18	04:42 21:11	05:29 20:22	10	06:15 (3) 06:25 (3)	06:22 19:11	22	06:48 (4) 06:59 (4)	07:14 18:00	07:11 16:00	07:56 15:35
15	07:58 16:04	07:10 17:01	06:08 17:54	15	06:32 (5) 06:47 (5)	05:55 19:49		04:55 20:41	04:25 21:18	04:43 21:10	05:31 20:20	14	06:12 (3) 06:26 (3)	06:24 19:09	8	06:50 (4) 06:58 (4)	07:16 17:58	07:13 16:00	07:57 15:35
16	07:57 16:06	07:08 17:03	06:06 17:56	13	06:33 (5) 06:46 (5)	05:53 19:51	2	04:53 20:43	04:25 21:19	04:44 20:18	05:33 20:18	16	06:11 (3) 06:27 (3)	06:25 19:07	4	06:51 (4) 06:55 (4)	07:18 17:56	07:15 16:00	07:58 15:35
17	07:56 16:07	07:06 17:05	06:03 17:58	10	06:35 (5) 06:45 (5)	05:50 19:53	6	06:14 (3) 06:20 (3)	04:52 20:45	04:46 21:19	05:34 21:08	17	06:10 (3) 06:27 (3)	06:27 19:04		06:58 (4) 06:59 (3)	07:19 17:54	07:17 16:00	07:59 15:35
18	07:55 16:09	07:04 17:07	06:01 17:59	5	06:36 (5) 06:41 (5)	05:48 19:55	9	06:12 (3) 06:21 (3)	04:50 20:46	04:45 21:20	05:36 21:07	19	06:09 (3) 06:28 (3)	06:29 19:02		06:59 (4) 06:58 (3)	07:21 17:51	07:18 16:00	08:00 15:35
19	07:54 16:11	07:02 17:09	05:59 18:01		06:41 (5) 19:57	05:46 19:57		06:10 (3) 06:22 (3)	04:49 20:48	04:25 21:20	04:48 21:06	19	06:09 (3) 06:28 (3)	06:30 18:59		06:59 (4) 06:58 (3)	07:23 17:49	07:20 16:00	08:00 15:36
20	07:53 16:12	07:00 17:11	05:56 18:03		06:43 (5) 19:58	05:44 19:58	15	06:08 (3) 06:23 (3)	04:47 20:49	04:25 21:20	04:50 21:05	20	06:08 (3) 06:28 (3)	06:32 18:57		06:58 (4) 06:59 (3)	07:25 17:47	07:22 16:00	08:01 15:36
21	07:51 16:14	06:58 17:13	05:54 18:05		06:41 (5) 20:00	05:42 20:00	17	06:06 (3) 06:23 (3)	04:46 20:51	04:25 21:21	04:51 21:03	20	06:09 (3) 06:28 (3)	06:34 18:55		06:57 (4) 06:58 (3)	07:27 17:45	07:24 16:00	08:02 15:36
22	07:50 16:16	06:56 17:15	05:51 18:07		06:39 (5) 20:02	05:39 20:02	19	06:03 (3) 06:22 (3)	04:45 20:52	04:26 21:21	04:53 21:02	19	06:10 (3) 06:27 (3)	06:35 18:52		06:56 (4) 06:57 (3)	07:28 17:43	07:26 16:00	08:02 15:37
23	07:49 16:18	06:54 17:17	05:49 18:08		06:37 (5) 20:04	05:37 20:04	19	06:03 (3) 06:22 (3)	04:43 20:54	04:26 21:21	04:54 21:01	17	06:12 (3) 06:26 (3)	06:37 18:50		06:55 (4) 06:56 (3)	07:30 17:40	07:27 16:00	08:03 15:37
24	07:48 16:19	06:52 17:19	05:47 18:10		06:35 (5) 20:05	05:35 20:05	19	06:03 (3) 06:22 (3)	04:42 20:55	04:26 21:21	04:55 20:59	14	06:14 (3) 06:26 (3)	06:39 18:47		06:54 (4) 06:55 (3)	07:32 17:38	07:29 16:00	08:03 15:38
25	07:46 16:21	06:49 17:21	05:44 18:12		06:33 (5) 20:07	05:33 20:07	18	06:03 (3) 06:21 (3)	04:41 20:57	04:26 21:21	04:57 20:58	12	06:15 (3) 06:28 (3)	06:41 18:45		06:53 (4) 06:54 (3)	07:34 17:36	07:31 16:00	08:04 15:39
26	07:45 16:23	06:47 17:23	05:42 18:14		06:31 (5) 20:09	05:31 20:09	17	06:03 (3) 06:20 (3)	04:39 20:58	04:27 21:21	04:58 20:56	5	06:17 (3) 06:22 (3)	06:42 18:43	9	07:17 (5) 07:26 (5)	06:36 17:35	07:32 16:00	08:04 15:40
27	07:44 16:25	06:45 17:24	05:40 18:16	4	06:30 (4) 06:07 (4)	05:29 20:11		06:04 (3) 06:19 (3)	04:38 20:59	04:27 21:21	05:00 20:55	2	06:18 (3) 06:20 (3)	06:44 18:40	3	07:15 (5) 07:28 (5)	06:38 16:32	07:34 15:43	08:04 15:40
28	07:42 16:27	06:43 17:26	05:37 18:17	7	06:00 (4) 06:07 (4)	05:27 20:12	13	06:05 (3) 06:18 (3)	04:37 21:01	04:28 21:21	05:01 20:53		06:46 18:38	06:47 17:33	15	07:20 (5) 07:29 (5)	06:40 16:30	07:35 15:42	08:04 15:41
29	07:41 16:29	06:35 17:19	05:35 18:19	11	06:58 (4) 07:09 (4)	05:25 20:14	9	06:07 (3) 06:16 (3)	04:36 21:02	04:28 21:21	05:03 20:52		06:55 18:35	06:47 17:18	15	07:23 (5) 07:28 (5)	06:41 16:28	07:37 15:41	08:04 15:42
30	07:39 16:31	06:32 17:21	05:32 18:10	13	06:55 (4) 07:08 (4)	05:23 20:16		04:35 21:03	04:29 21:20	05:05 20:50	05:56 19:47		06:49 18:33	06:47 17:15	13	07:25 (5) 07:28 (5)	06:43 16:26	07:39 15:40	08:05 15:43
31	07:38 16:33	06:30 17:23	05:30 18:09	16	06:53 (4) 07:09 (4)			04:34 21:04	04:29 21:20	05:06 20:48	05:58 19:45		06:49 18:33	06:45 17:24		06:45 16:24	06:45 15:44	08:05 15:44	
Potential sun hours	254	275	367		418			490	505	507	457		382	200		330	263	238	
Total, worst case				187		274						196		200		75		159	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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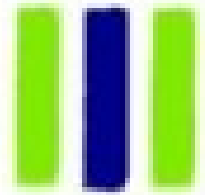
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** J - Shadow Receptor: 1.5 × 1.5 Azimuth: -102.8° Slope: 90.0° (10)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June
1	08:05	07:36	06:41	06:28	06:51 (5)	05:21
	15:45	16:34	17:28	19:24	06:56 (5)	20:18
2	08:04	07:34	06:38	06:25	06:48 (5)	05:19
	15:46	16:36	17:30	19:26	06:56 (5)	20:19
3	08:04	07:33	06:36	06:23	06:46 (5)	05:17
	15:47	16:38	17:32	19:28	06:56 (5)	20:21
4	08:04	07:31	06:34	06:21	06:44 (5)	05:15
	15:48	16:40	17:34	19:30	06:56 (5)	20:23
5	08:04	07:29	06:31	06:18	06:41 (5)	05:13
	15:50	16:42	17:36	19:32	06:55 (5)	20:25
6	08:03	07:28	06:29	06:16	06:42 (5)	05:11
	15:51	16:44	17:38	19:33	06:54 (5)	20:26
7	08:03	07:26	06:27	06:13	06:43 (5)	05:09
	15:52	16:46	17:39	19:35	06:53 (5)	20:28
8	08:02	07:24	06:25	06:11	06:45 (5)	05:07
	15:53	16:48	17:41	19:37	06:49 (5)	20:30
9	08:02	07:22	06:22	06:09		05:05
	15:55	16:50	17:43	19:39		20:32
10	08:01	07:20	06:20	06:06		05:03
	15:56	16:52	17:45	19:41		20:33
11	08:01	07:18	06:18	06:04		05:02
	15:58	16:54	17:47	19:42		20:35
12	08:00	07:16	06:15	06:02		05:00
	15:59	16:56	17:49	19:44		20:37
13	07:59	07:14	06:13	06:00		04:58
	16:01	16:58	17:50	19:46		20:38
14	07:58	07:12	06:10	05:57		04:57
	16:02	17:00	17:52	19:48		20:40
15	07:58	07:10	06:08	05:55		04:55
	16:04	17:02	17:54	19:49		20:41
16	07:57	07:08	06:06	05:53		04:53
	16:06	17:03	17:56	19:51		20:43
17	07:56	07:06	06:03	05:50		04:52
	16:07	17:05	17:58	19:53		20:45
18	07:55	07:04	06:01	05:48		04:50
	16:09	17:07	17:59	19:55		20:46
19	07:54	07:02	05:59	05:46	06:10 (4)	04:49
	16:11	17:09	18:01	19:57	06:13 (4)	20:48
20	07:53	07:00	05:56	06:19 (6)	06:08 (4)	04:47
	16:12	17:11	18:03	06:21 (6)	06:14 (4)	20:49
21	07:51	06:58	05:54	06:17 (6)	06:06 (4)	04:46
	16:14	17:13	18:05	06:21 (6)	06:15 (4)	20:51
22	07:50	06:56	05:51	06:15 (6)	06:03 (4)	04:45
	16:16	17:15	18:07	06:21 (6)	06:14 (4)	20:52
23	07:49	06:54	05:49	06:12 (6)	06:01 (4)	04:43
	16:18	17:17	18:08	06:20 (6)	06:14 (4)	20:54
24	07:48	06:52	05:47	06:10 (6)	05:59 (4)	04:42
	16:19	17:19	18:10	06:20 (6)	06:14 (4)	20:55
25	07:46	06:49	05:44	06:09 (6)	05:59 (4)	04:41
	16:21	17:21	18:12	06:17 (6)	06:14 (4)	20:57
26	07:45	06:47	05:42	06:12 (6)	05:59 (4)	04:39
	16:23	17:23	18:14	06:15 (6)	06:13 (4)	20:58
27	07:44	06:45	05:40		06:00 (4)	04:38
	16:25	17:24	18:16		06:12 (4)	20:59
28	07:42	06:43	05:37		06:01 (4)	04:37
	16:27	17:26	18:17		06:10 (4)	21:01
29	07:41		06:35		06:04 (4)	04:36
	16:29		19:19		06:06 (4)	21:02
30	07:39		06:32			04:35
	16:31		19:21			21:03
31	07:38		06:30	06:53 (5)		04:34
	16:33		19:23	06:55 (5)		21:04
Potential sun hours	254	275	367	418	490	505
Total, worst case			43	184	182	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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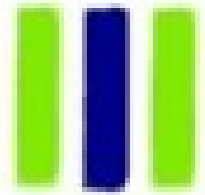
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal **Shadow receptor:** J - Shadow Receptor: 1.5 x 1.5 Azimuth: -102.8° Slope: 90.0° (10)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	July	August	September	October	November	December
1	04:30	05:08	05:37 (3)	06:00	06:51	06:47
	21:20	20:47	05:41 (3)	19:42	18:31	16:22
2	04:30	05:09	05:39 (3)	06:01	06:53	06:49
	21:20	20:45	05:41 (3)	19:40	18:28	16:20
3	04:31	05:11	06:03	06:54	06:51	07:43
	21:19	20:43	19:38	18:26	16:18	15:38
4	04:32	05:13	06:05	06:43 (5)	06:56	06:53
	21:19	20:41	19:35	06:46 (5)	18:23	16:16
5	04:33	05:14	06:07	06:40 (5)	06:58	06:55
	21:18	20:39	19:33	06:49 (5)	18:21	16:15
6	04:34	05:16	06:08	06:38 (5)	07:00	06:56
	21:18	20:38	19:31	06:50 (5)	18:19	16:13
7	04:34	05:17	06:10	06:36 (5)	07:01	06:58
	21:17	20:36	19:28	06:50 (5)	18:16	16:11
8	04:35	05:19	06:12	06:38 (5)	07:03	07:00
	21:17	20:34	19:26	06:50 (5)	18:14	16:09
9	04:36	05:21	06:13	06:40 (5)	07:05	07:02
	21:16	20:32	19:23	06:51 (5)	18:12	16:08
10	04:37	05:22	06:15	06:41 (5)	07:07	07:04
	21:15	20:30	19:21	06:49 (5)	18:09	16:06
11	04:39	05:24	06:17	06:43 (5)	07:09	07:06
	21:14	20:28	19:19	06:49 (5)	18:07	16:04
12	04:40	05:26	06:18	06:45 (5)	07:10	07:08
	21:13	20:26	19:16	06:48 (5)	18:05	16:03
13	04:41	05:28	06:20	07:12	07:09	07:55
	21:12	20:24	19:14	18:03	16:01	15:35
14	04:42	05:29	06:22	07:14	07:11	07:56
	21:11	20:22	06:16 (4)	18:00	15:59	15:35
15	04:43	05:31	06:08 (4)	07:16	07:13	07:57
	21:10	20:20	06:18 (4)	17:58	15:58	15:35
16	04:44	05:33	06:07 (4)	07:18	07:15	07:58
	21:09	20:18	06:19 (4)	17:56	15:56	15:35
17	04:46	05:32 (3)	06:05 (4)	07:19	07:17	07:59
	21:08	05:37 (3)	06:20 (4)	17:54	15:55	15:35
18	04:47	05:31 (3)	06:05 (4)	06:58 (6)	07:21	07:18
	21:07	05:39 (3)	06:20 (4)	07:05 (6)	17:51	15:54
19	04:48	05:29 (3)	06:06 (4)	06:56 (6)	07:23	07:20
	21:06	05:40 (3)	06:21 (4)	07:06 (6)	17:49	15:52
20	04:50	05:29 (3)	06:07 (4)	06:58 (6)	07:25	07:22
	21:05	05:42 (3)	06:20 (4)	07:07 (6)	17:47	15:51
21	04:51	05:28 (3)	06:09 (4)	07:00 (6)	07:27	07:24
	21:03	05:42 (3)	06:20 (4)	07:07 (6)	17:45	15:50
22	04:53	05:28 (3)	06:10 (4)	07:01 (6)	07:28	07:25
	21:02	05:42 (3)	06:19 (4)	07:06 (6)	17:43	15:49
23	04:54	05:28 (3)	06:12 (4)	07:03 (6)	07:30	07:27
	21:01	05:43 (3)	06:18 (4)	07:05 (6)	17:40	15:47
24	04:55	05:27 (3)	06:14 (4)	07:32	07:29	08:03
	20:59	05:43 (3)	06:17 (4)	17:38	15:46	15:38
25	04:57	05:27 (3)	06:41	06:34	07:31	08:04
	20:58	05:43 (3)	19:58	16:36	15:45	15:39
26	04:58	05:29 (3)	06:42	06:36	07:32	08:04
	20:56	05:44 (3)	19:56	16:34	15:44	15:39
27	05:00	05:30 (3)	06:44	06:38	07:34	08:04
	20:55	05:44 (3)	19:54	16:32	15:43	15:40
28	05:01	05:32 (3)	06:46	06:40	07:35	08:04
	20:53	05:44 (3)	19:51	16:30	15:42	15:41
29	05:03	05:33 (3)	06:48	06:41	07:37	08:04
	20:52	05:43 (3)	19:49	16:28	15:41	15:42
30	05:05	05:34 (3)	06:49	06:43	07:39	08:05
	20:50	05:43 (3)	19:47	16:26	15:40	15:43
31	05:06	05:36 (3)	05:58	06:45		08:05
	20:48	05:43 (3)	19:45	16:24		15:44
Potential sun hours	507	457	382	330	263	238
Total, worst case	179	120	118			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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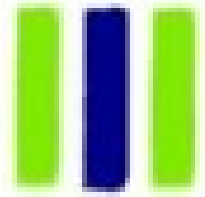
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** K - Shadow Receptor: 1.5 × 1.5 Azimuth: -59.7° Slope: 90.0° (2)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:05 15:45	09:33 (1) 09:50 (1)	07:36 16:34	06:41 17:28	06:28 19:24	05:20 20:18	04:33 21:06	04:29 21:20	05:08 20:47	06:00 19:42	06:51 18:31	06:47 16:22	07:40 15:40	
2	08:04 15:46	09:35 (1) 09:50 (1)	07:34 16:36	06:38 17:30	06:25 19:26	05:18 20:19	04:32 21:07	04:30 21:20	05:09 20:45	06:01 19:40	06:53 18:28	06:49 16:20	07:42 15:39	
3	08:04 15:47	09:36 (1) 09:50 (1)	07:33 16:38	06:36 17:32	06:23 19:28	05:17 20:21	04:31 21:08	04:31 21:19	05:11 20:43	06:03 19:38	06:54 18:26	06:51 16:18	07:43 15:38	
4	08:04 15:48	09:37 (1) 09:49 (1)	07:31 16:40	06:34 17:34	06:20 19:30	05:15 20:23	04:30 21:09	04:32 21:19	05:12 20:41	06:05 19:35	06:56 18:23	06:53 16:16	07:44 15:38	
5	08:04 15:49	09:39 (1) 09:41 (1)	07:29 16:42	06:31 17:36	06:18 19:32	05:13 20:25	04:30 21:10	04:33 21:18	05:14 20:40	06:07 19:33	06:58 18:21	06:55 16:15	07:46 15:37	
6	08:03 15:51	09:41 (1) 09:47 (1)	07:28 16:44	06:29 17:37	06:16 19:33	05:11 20:26	04:29 21:11	04:33 21:18	05:16 20:38	06:08 19:31	07:00 18:19	06:56 16:13	07:47 15:37	09:27 (1) 09:33 (1)
7	08:03 15:52	08:03 15:52	07:26 16:46	06:27 17:39	06:13 19:35	05:09 20:28	04:28 21:12	04:34 21:17	05:17 20:36	06:10 19:28	07:01 18:16	06:58 16:11	07:49 15:36	09:26 (1) 09:36 (1)
8	08:03 15:53	08:03 15:53	07:24 16:48	06:25 17:41	06:11 19:37	05:07 20:30	04:28 21:13	04:35 21:17	05:19 20:34	06:12 19:26	07:03 18:14	07:00 16:09	07:50 15:36	09:25 (1) 09:37 (1)
9	08:02 15:55	08:02 15:55	07:22 16:50	06:22 17:43	06:09 19:39	05:05 20:32	04:27 21:14	04:36 21:16	05:21 20:32	06:13 19:23	07:05 18:12	07:02 16:08	07:51 15:35	09:24 (1) 09:38 (1)
10	08:01 15:56	08:01 15:56	07:20 16:52	06:20 17:45	06:06 19:41	05:03 20:33	04:27 21:15	04:37 21:15	05:22 20:30	06:15 19:21	07:07 18:09	07:04 16:06	07:52 15:35	09:24 (1) 09:39 (1)
11	08:01 15:58	08:01 15:58	07:18 16:54	06:18 17:47	06:04 19:42	05:02 20:35	04:26 21:16	04:38 21:14	05:24 20:28	06:17 19:19	07:09 18:07	07:06 16:04	07:53 15:35	09:24 (1) 09:41 (1)
12	08:00 15:59	08:00 15:59	07:16 16:56	06:15 17:49	06:02 19:44	05:00 20:37	04:26 21:16	04:40 21:13	05:26 20:26	06:18 19:16	07:10 18:05	07:08 16:03	07:54 15:35	09:46 (3) 09:42 (1)
13	07:59 16:01	07:59 16:01	07:14 16:58	06:13 17:50	06:00 19:46	04:58 20:38	04:26 21:17	04:41 21:12	05:27 20:24	06:20 19:14	07:12 18:03	07:09 16:01	07:55 15:35	09:45 (3) 09:43 (1)
14	07:59 16:02	07:59 16:02	07:12 17:00	06:10 17:52	05:57 19:48	04:57 20:40	04:25 21:18	04:42 21:12	05:29 20:22	06:22 19:11	07:14 18:00	07:11 15:59	07:56 15:35	09:45 (3) 09:43 (1)
15	07:58 16:04	07:58 16:04	07:10 17:01	06:08 17:54	05:55 19:49	04:55 20:41	04:25 21:18	04:43 21:10	05:31 20:20	06:24 19:09	07:16 17:58	07:13 15:58	07:57 15:35	09:45 (3) 09:44 (1)
16	07:57 16:06	07:57 16:06	07:08 17:03	06:06 17:56	05:53 19:51	04:53 20:43	04:25 21:19	04:44 21:09	05:33 20:18	06:25 19:07	07:18 17:56	07:15 15:56	07:58 15:35	09:45 (3) 09:45 (1)
17	07:56 16:07	07:56 16:07	07:06 17:05	06:03 17:58	05:50 19:53	04:52 20:45	04:25 21:19	04:46 21:08	05:34 20:16	06:27 19:04	07:19 17:53	07:17 15:55	07:59 15:35	09:44 (3) 09:45 (1)
18	07:55 16:09	07:55 16:09	07:04 17:07	06:01 17:59	05:48 19:55	04:50 20:46	04:25 21:20	04:47 21:07	05:36 20:14	06:29 19:02	07:21 17:51	07:19 15:54	08:00 15:35	09:45 (3) 09:46 (1)
19	07:54 16:11	07:54 16:11	07:02 17:09	05:59 18:01	05:46 19:57	04:49 20:48	04:25 21:20	04:48 21:06	05:38 20:11	06:30 18:59	07:23 17:49	07:20 15:52	08:00 15:36	09:46 (3) 09:47 (1)
20	07:53 16:12	07:53 16:12	07:00 17:11	05:56 18:03	05:44 19:58	04:47 20:49	04:25 21:20	04:50 21:05	05:39 20:09	06:32 18:57	07:25 17:47	07:22 15:51	08:01 15:36	09:45 (3) 09:47 (1)
21	07:51 16:14	07:51 16:14	06:58 17:13	05:54 18:05	05:42 20:00	04:46 20:51	04:25 21:21	04:51 21:03	05:41 20:07	06:34 18:55	07:27 17:45	07:24 15:50	08:02 15:36	09:46 (3) 09:48 (1)
22	07:50 16:16	07:50 16:16	06:56 17:15	05:51 18:07	05:39 20:02	04:44 20:52	04:25 21:21	04:52 21:02	05:43 20:05	06:35 18:52	07:28 17:43	07:26 15:48	08:02 15:37	09:46 (3) 09:48 (1)
23	07:49 16:18	07:49 16:18	06:54 17:17	05:49 18:08	05:37 20:04	04:43 20:54	04:26 21:21	04:54 21:01	05:44 20:03	06:37 18:50	07:30 17:40	07:27 15:47	08:03 15:37	09:47 (3) 09:49 (1)
24	07:48 16:19	07:48 16:19	06:52 17:19	05:47 18:10	05:35 20:05	04:42 20:55	04:26 21:21	04:55 20:59	05:46 20:00	06:39 18:47	07:32 17:38	07:29 15:46	08:03 15:38	09:47 (3) 09:49 (1)
25	07:46 16:21	07:46 16:21	06:49 17:21	05:44 18:12	05:33 20:07	04:41 20:57	04:26 21:21	04:57 20:58	05:48 19:58	06:41 18:45	07:34 17:36	07:31 15:45	08:04 15:38	09:48 (3) 09:49 (1)
26	07:45 16:23	07:45 16:23	06:47 17:23	05:42 18:14	05:31 20:09	04:39 20:58	04:27 21:21	04:58 20:56	05:50 19:56	06:42 18:43	07:36 17:34	07:32 15:44	08:04 15:39	09:49 (3) 09:50 (1)
27	07:44 16:25	07:44 16:25	06:45 17:24	05:40 18:16	05:29 20:11	04:38 20:59	04:27 21:21	05:00 20:55	05:51 19:54	06:44 18:40	07:38 17:32	07:34 15:43	08:04 15:40	09:50 (3) 09:50 (1)
28	07:42 16:27	07:42 16:27	06:43 17:26	05:37 18:17	05:27 20:12	04:37 21:01	04:28 21:21	05:01 20:53	05:53 19:51	06:46 18:38	07:40 17:30	07:36 15:42	08:04 15:41	09:50 (3) 09:51 (3)
29	07:41 16:29	07:41 16:29		06:35 19:19	05:25 20:14	04:36 21:02	04:28 21:21	05:03 20:52	05:55 19:49	06:47 18:35	07:41 17:28	07:37 15:41	08:05 15:42	09:51 (3) 09:50 (1)
30	07:39 16:31	07:39 16:31		06:32 19:21	05:23 20:16	04:35 21:03	04:29 21:20	05:04 20:50	05:56 19:47	06:49 18:33	07:43 17:26	07:39 15:40	08:05 15:43	09:52 (3) 09:51 (1)
31	07:38 16:32	07:38 16:32		06:30 19:23		04:34 21:05		05:06 20:48	05:58 19:45		06:45 16:24		08:05 15:43	09:54 (3) 09:51 (1)
Potential sun hours	254		275	367	418	490	505	507	457	382	330	262	238	
Total, worst case	74													634

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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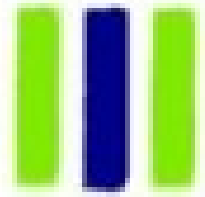
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** L - Shadow Receptor: 1.5 × 1.5 Azimuth: 162.3° Slope: 90.0° (3)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:05	07:36	06:41	06:28	05:20	04:33	04:29	05:08	06:00	06:51	06:47	07:40
	15:45	16:34	17:28	19:24	20:18	21:06	21:20	20:47	19:42	18:31	16:22	15:40
2	08:05	07:34	06:38	06:25	05:18	04:32	04:30	05:09	06:01	06:53	06:49	07:42
	15:46	16:36	17:30	19:26	20:20	21:07	21:20	20:45	19:40	18:28	16:20	15:39
3	08:04	07:33	06:36	06:23	05:16	04:31	04:31	05:11	06:03	06:54	06:51	07:43
	15:47	16:38	17:32	19:28	20:21	21:08	21:19	20:43	19:38	18:26	16:18	15:38
4	08:04	07:31	06:34	06:20	05:14	04:30	04:32	05:12	06:05	06:56	06:53	07:45
	15:48	16:40	17:34	19:30	20:23	21:09	21:19	20:41	19:35	18:23	16:16	15:38
5	08:04	07:29	06:31	06:18	05:13	04:30	04:32	05:14	06:07	06:58	06:55	07:46
	15:49	16:42	17:36	19:32	20:25	21:10	21:19	20:40	19:33	18:21	16:14	15:37
6	08:03	07:28	06:29	06:16	05:11	04:29	04:33	05:16	06:08	07:00	06:56	07:47
	15:51	16:44	17:37	19:33	20:26	21:11	21:18	20:38	19:31	18:19	16:13	15:36
7	08:03	07:26	06:27	06:13	05:09	04:28	04:34	05:17	06:10	07:01	06:58	07:49
	15:52	16:46	17:39	19:35	20:28	21:12	21:17	20:36	19:28	18:16	16:11	15:36
8	08:03	07:24	06:25	06:11	05:07	04:28	04:35	05:19	06:12	07:03	07:00	07:50
	15:53	16:48	17:41	19:37	20:30	21:13	21:17	20:34	19:26	18:14	16:09	15:36
9	08:02	07:22	06:22	06:09	05:05	04:27	04:36	05:21	06:13	07:05	07:02	07:51
	15:55	16:50	17:43	19:39	20:32	21:14	21:16	20:32	19:23	18:12	16:07	15:35
10	08:01	07:20	06:20	06:06	05:03	04:27	04:37	05:22	06:15	07:07	07:04	07:52
	15:56	16:52	17:45	19:41	20:33	21:15	21:15	20:30	19:21	18:09	16:06	15:35
11	08:01	07:18	06:18	06:04	05:02	04:26	04:38	05:24	06:17	07:09	07:06	07:53
	15:58	16:54	17:47	19:42	20:35	21:16	21:14	20:28	19:19	18:07	16:04	15:35
12	08:00	07:16	06:15	06:02	05:00	04:26	04:39	05:26	06:18	07:10	07:08	07:54
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	16:14	17:13	18:05	20:00	20:51	21:21	21:03	20:07	18:55	17:45	15:50	15:36
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	16:16	17:15	18:07	20:02	20:52	21:21	21:02	20:05	18:52	17:42	15:48	15:37
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31	07:38		06:30		04:34		05:06	05:58		06:45		08:05
	16:32		19:23		21:05		20:48	19:45		16:24		15:43
Potential sun hours	254	275	367	418	490	505	507	457	382	330	262	238
Total, worst case												

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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EMPEKO

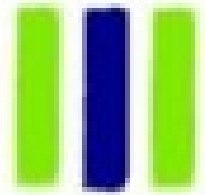
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** M - Shadow Receptor: 1.5 × 1.5 Azimuth: 162.3° Slope: 90.0° (14)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:05	07:36	06:40	06:27	05:20	04:33	04:29	05:07	06:00	06:51	06:47	07:40
	15:45	16:34	17:28	19:24	20:18	21:06	21:20	20:47	19:42	18:30	16:22	15:39
2	08:04	07:34	06:38	06:25	05:18	04:32	04:30	05:09	06:01	06:53	06:49	07:42
	15:46	16:36	17:30	19:26	20:19	21:07	21:20	20:45	19:40	18:28	16:20	15:39
3	08:04	07:33	06:36	06:23	05:16	04:31	04:31	05:11	06:03	06:54	06:51	07:43
	15:47	16:38	17:32	19:28	20:21	21:08	21:19	20:43	19:38	18:26	16:18	15:38
4	08:04	07:31	06:34	06:20	05:14	04:30	04:32	05:12	06:05	06:56	06:53	07:44
	15:48	16:40	17:34	19:30	20:23	21:09	21:19	20:41	19:35	18:23	16:16	15:37
5	08:04	07:29	06:31	06:18	05:12	04:30	04:32	05:14	06:06	06:58	06:55	07:46
	15:49	16:42	17:36	19:32	20:25	21:10	21:18	20:39	19:33	18:21	16:14	15:37
6	08:03	07:28	06:29	06:16	05:11	04:29	04:33	05:16	06:08	07:00	06:56	07:47
	15:51	16:44	17:37	19:33	20:26	21:11	21:18	20:38	19:30	18:19	16:13	15:36
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	15:52	16:46	17:39	19:35	20:28	21:12	21:17	20:36	19:28	18:16	16:11	15:36
8	08:02	07:24	06:24	06:11	05:07	04:28	04:35	05:19	06:12	07:03	07:00	07:50
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	15:58	16:54	17:47	19:42	20:35	21:16	21:14	20:28	19:19	18:07	16:04	15:35
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19	07:54	07:02	05:59	05:46	04:49	04:25	04:48	05:37	06:30	07:23	07:20	08:00
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20	07:53	07:00	05:56	05:44	04:47	04:25	04:49	05:39	06:32	07:25	07:22	08:01
	16:12	17:11	18:03	19:58	20:49	21:20	21:05	20:09	18:57	17:47	15:51	15:36
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31	07:38		06:30		04:34		05:06	05:58		06:45		08:05
	16:32		19:23		21:05		20:48	19:45		16:24		15:43
Potential sun hours	254	275	367	418	490	505	507	457	382	330	262	238
Total, worst case												

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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EMPEKO

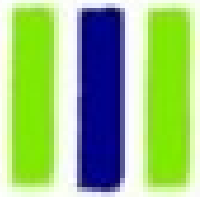
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** N - Shadow Receptor: 1.5 × 1.5 Azimuth: 86.5° Slope: 90.0° (15)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:05 15:45	07:36 16:34	06:40 17:28	06:27 19:24	05:20 20:18	19:31 (10) 19:48 (11)	04:33 21:06	04:29 21:20	05:07 20:47	7 20:08 (12)	06:00 19:42	06:51 18:30	06:47 16:22	07:40 15:39
2	08:04 15:46	07:34 16:36	06:38 17:30	06:25 19:26	05:18 20:19	19:32 (10) 19:50 (11)	04:32 21:07	04:30 21:20	05:09 20:45	6 20:14 (12)	06:01 19:40	06:53 18:28	06:49 16:20	07:42 15:39
3	08:04 15:47	07:33 16:38	06:36 17:32	06:23 19:28	05:16 20:21	19:41 (11) 19:50 (11)	04:31 21:08	04:31 21:19	05:11 20:43	5 20:12 (12)	06:03 19:38	06:54 18:26	06:51 16:18	07:43 15:38
4	08:04 15:48	07:31 16:40	06:34 17:34	06:20 19:30	05:14 20:23	19:43 (11) 19:48 (11)	04:30 21:09	04:31 21:19	05:12 20:41	4 20:11 (12)	06:05 19:35	06:56 18:23	06:53 16:16	07:44 15:37
5	08:04 15:49	07:29 16:42	06:31 17:36	06:18 19:32	05:12 20:25		04:30 21:10	04:32 21:18	05:14 20:39		20:07 (12)	06:06 19:33	06:58 18:21	06:55 16:14
6	08:03 15:51	07:28 16:44	06:29 17:37	06:16 19:33	05:11 20:26		04:29 21:11	04:33 21:18	05:16 20:38	2 20:09 (12)	06:08 19:30	07:00 18:19	06:56 16:13	07:47 15:36
7	08:03 15:52	07:26 16:46	06:27 17:39	06:13 19:35	05:09 20:28	19:57 (12) 19:59 (12)	04:28 21:12	04:34 21:17	05:17 20:36		06:10 19:28	07:01 18:16	06:58 16:11	07:48 15:36
8	08:03 15:53	07:24 16:48	06:24 17:41	06:11 19:37	05:07 20:30	19:57 (12) 20:00 (12)	04:28 21:13	04:35 21:17	05:19 20:34		06:12 19:26	07:03 18:14	07:00 16:09	07:50 15:36
9	08:02 15:55	07:22 16:50	06:22 17:43	06:09 19:39	05:05 20:32	19:57 (12) 20:01 (12)	04:27 21:14	04:36 21:16	05:21 20:32	6 19:57 (11)	06:13 19:23	07:05 18:12	07:02 16:07	07:51 15:35
10	08:01 15:56	07:20 16:52	06:20 17:45	06:06 19:40	05:03 20:33	19:57 (12) 20:02 (12)	04:27 21:15	04:37 21:15	05:22 20:30		19:44 (10) 19:59 (11)	06:15 19:21	07:07 18:09	07:52 16:06
11	08:01 15:57	07:18 16:54	06:17 17:47	06:04 19:42	05:01 20:35	19:58 (12) 20:05 (12)	04:26 21:16	04:38 21:14	05:24 20:28	13 19:41 (10)	06:17 19:19	07:08 18:07	07:06 16:04	07:53 15:35
12	08:00 15:59	07:16 16:55	06:15 17:48	06:02 19:44	05:00 20:37	19:58 (12) 20:06 (12)	04:26 21:16	04:39 21:13	05:26 20:26	18 19:39 (10)	06:18 19:16	07:10 18:05	07:08 16:02	07:54 15:35
13	07:59 16:01	07:14 16:57	06:13 17:50	05:59 19:46	04:58 20:38	20:00 (12) 20:06 (12)	04:26 21:17	04:40 21:12	05:27 20:24	17 19:56 (11)	06:20 19:16	07:12 18:05	07:09 16:02	07:55 15:35
14	07:58 16:02	07:12 16:59	06:10 17:52	05:57 19:48	04:56 20:40		04:25 21:18	04:42 21:11	05:29 20:22	25 19:55 (11)	06:22 19:14	07:14 18:02	07:11 16:01	07:56 15:35
15	07:58 16:04	07:10 17:01	06:08 17:54	05:55 19:49	19:18 (9) 19:22 (9)	04:55 20:41	04:25 21:18	04:43 21:10	05:31 20:20	28 19:52 (10)	06:23 19:09	07:16 17:58	07:13 15:58	07:57 15:35
16	07:57 16:05	07:08 17:03	06:06 17:56	05:53 19:51	19:16 (9) 19:24 (9)	04:53 20:43	04:25 21:19	04:44 21:09	05:32 20:18	29 19:51 (10)	06:25 19:07	07:17 17:56	07:15 15:56	07:58 15:35
17	07:56 16:07	07:06 17:05	06:03 17:58	05:50 19:53	19:14 (9) 19:25 (9)	04:52 20:45	04:25 21:19	04:45 21:08	05:34 20:16	31 19:50 (11)	06:27 19:04	07:19 17:53	07:17 15:55	07:59 15:35
18	07:55 16:09	07:04 17:07	06:01 17:59	05:48 19:55	19:13 (9) 19:27 (9)	04:50 20:46	04:25 21:20	04:47 21:07	05:36 20:14	30 19:47 (10)	06:29 19:02	07:21 17:51	07:18 15:53	08:00 15:35
19	07:54 16:10	07:02 17:09	05:58 18:01	05:46 19:56	19:12 (9) 19:29 (9)	04:49 20:48	04:25 21:20	04:48 21:06	05:37 20:11	28 19:45 (10)	06:30 18:59	07:23 17:49	07:20 15:52	08:00 15:35
20	07:53 16:12	07:00 17:11	05:56 18:03	05:44 19:58	19:11 (9) 19:30 (9)	04:47 20:49	04:25 21:20	04:49 21:05	05:39 20:09	26 19:42 (10)	06:32 18:57	07:25 17:47	07:22 15:51	08:01 15:36
21	07:51 16:14	06:58 17:13	05:54 18:05	05:41 20:00	19:10 (9) 19:32 (9)	04:46 20:51	04:25 21:21	04:51 21:03	05:41 20:07	24 19:41 (10)	06:34 18:54	07:27 17:45	07:24 15:49	08:02 15:36
22	07:50 16:16	06:56 17:15	05:51 18:07	05:39 20:02	19:10 (9) 19:35 (10)	04:44 20:52	04:25 21:21	04:52 21:02	05:43 20:05	22 19:38 (9)	06:35 18:52	07:28 17:42	07:26 15:48	08:02 15:37
23	07:49 16:17	06:54 17:17	05:49 18:08	05:37 20:04	19:10 (9) 19:35 (10)	04:43 20:54	04:25 21:21	04:54 21:01	05:44 20:06	21 19:36 (9)	06:37 18:50	07:30 17:40	07:27 15:47	08:03 15:37
24	07:48 16:19	06:52 17:19	05:47 18:10	05:35 20:05	19:10 (9) 19:37 (10)	04:42 20:55	04:26 21:21	04:55 20:59	05:46 20:00	19 19:15 (9)	06:39 18:47	07:32 17:38	07:29 15:46	08:03 15:38
25	07:46 16:21	06:49 17:20	05:44 18:12	05:33 20:07	19:10 (9) 19:39 (10)	04:40 20:57	04:26 21:21	04:57 20:58	05:48 19:58	17 19:16 (9)	06:40 18:45	07:34 17:36	07:31 15:45	08:04 15:38
26	07:45 16:23	06:47 17:22	05:42 18:14	05:31 20:09	19:11 (9) 19:40 (10)	04:39 20:58	04:26 21:21	04:58 20:56	05:49 19:56	14 19:17 (9)	06:42 18:42	07:36 17:34	07:32 15:44	08:04 15:39
27	07:44 16:25	06:45 17:24	05:39 18:15	05:29 20:11	19:12 (9) 19:42 (10)	04:38 20:59	04:27 21:21	05:00 20:55	05:51 19:54	11 19:18 (9)	06:44 18:40	07:38 17:32	07:34 15:43	08:04 15:40
28	07:42 16:27	06:43 17:26	05:37 18:17	05:26 20:12	19:13 (9) 19:44 (10)	04:37 21:01	04:27 21:21	05:01 20:53	05:53 19:51	7 19:25 (9)	06:46 18:38	07:40 17:30	07:35 15:42	08:04 15:41
29	07:41 16:29		06:35 19:19	05:24 20:14	19:14 (9) 19:45 (11)	04:36 21:02	04:28 21:21	05:03 20:52	05:54 19:49	3 19:23 (9)	06:47 18:35	07:41 17:28	07:37 15:41	08:05 15:41
30	07:39 16:30		06:32 19:21	05:22 20:16	19:17 (9) 19:47 (11)	04:35 21:03	04:29 21:20	05:04 20:50	05:56 20:12 (12)		06:49 19:47	07:39 17:34	08:05 15:42	
31	07:38 16:32		06:30 19:23			04:34 21:05		05:06 20:48	05:58 19:44	2 20:10 (12) 20:17 (12)	05:58 19:44	06:45 16:24	08:05 15:43	
Potential sun hours	254	275	367	418	490	505	507	457	415	382	330	262	238	
Total, worst case				337	490	84	507	9						

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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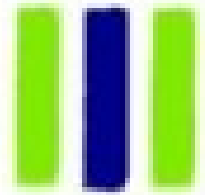
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252



SHADOW - Calendar

Calculation: Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal

Shadow receptor: O - Shadow Receptor: 1.5 × 1.5 Azimuth: 86.5° Slope: 90.0° (19)

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
 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

	January	February	March		April		May	June	July	August		September		October		November	December		
1	08:05 15:45	07:36 16:34	06:40 17:28		06:27 19:24	12	18:45 (10) 20:18	05:20 21:06	04:33 21:20	04:29 20:47		06:00 19:42		06:51 18:30	9	17:54 (9) 18:03 (9)	06:47 16:22	07:40 15:39	
2	08:04 15:46	07:34 16:36	06:38 17:30		06:25 19:26	10	18:45 (10) 18:55 (10)	05:18 20:19	04:32 21:07	04:30 21:20	05:09 20:45		06:01 19:40		06:53 18:28	4	17:55 (9) 17:59 (9)	06:49 16:20	07:42 15:39
3	08:04 15:47	07:33 16:38	06:36 17:32		06:23 19:28	4	18:48 (10) 18:52 (10)	05:16 20:21	04:31 21:08	04:31 21:19	05:11 20:43		06:03 19:38	5	19:01 (11) 19:06 (11)	06:54 18:26	06:51 16:18	07:43 15:38	
4	08:04 15:48	07:31 16:40	06:34 17:34		06:20 19:30	3	19:00 (11) 19:03 (11)	05:14 20:23	04:30 21:09	04:31 21:19	05:12 20:41		06:05 19:35	9	18:58 (11) 19:07 (11)	06:56 18:23	06:53 16:16	07:44 15:37	
5	08:04 15:49	07:29 16:42	06:31 17:35		06:18 19:32	5	19:00 (11) 19:05 (11)	05:12 20:25	04:30 21:10	04:32 21:18	05:14 20:39		06:06 19:33	8	18:57 (11) 19:05 (11)	06:58 18:21	06:55 16:14	07:46 15:37	
6	08:03 15:50	07:28 16:44	06:29 17:37		06:16 19:33	7	19:00 (11) 19:07 (11)	05:11 20:26	04:29 21:11	04:33 21:18	05:16 20:38		06:08 19:30	7	18:56 (11) 19:03 (11)	07:00 18:19	06:56 16:13	07:47 15:36	
7	08:03 15:52	07:26 16:46	06:27 17:39		06:13 19:35	8	19:00 (11) 19:08 (11)	05:09 20:28	04:28 21:12	04:34 21:17	05:17 20:36		06:10 19:28	5	18:55 (11) 19:00 (11)	07:01 18:16	06:58 16:11	07:49 15:36	
8	08:03 15:53	07:24 16:48	06:24 17:41		06:11 19:37	9	19:01 (11) 19:10 (11)	05:07 20:30	04:28 21:13	04:35 21:17	05:19 20:34		06:11 19:26	3	18:55 (11) 18:58 (11)	07:03 18:14	07:00 16:09	07:50 15:36	
9	08:02 15:55	07:22 16:50	06:22 17:43		06:09 19:39	5	19:03 (11) 19:08 (11)	05:05 20:32	04:27 21:14	04:36 21:16	05:21 20:32		06:13 19:23	3	18:42 (10) 18:45 (10)	07:05 18:12	07:02 16:07	07:51 15:35	
10	08:01 15:56	07:20 16:52	06:20 17:45		06:06 19:40		05:03 20:33	04:27 21:15	04:37 21:15	04:37 21:15	05:22 20:30		06:15 19:21	10	18:38 (10) 18:48 (10)	07:07 18:09	07:04 16:06	07:52 15:35	
11	08:01 15:57	07:18 16:54	06:17 17:47	3	17:18 (9) 17:21 (9)		06:04 19:42	05:01 20:35	04:26 21:16	04:38 21:14	05:24 20:28		06:17 19:19	12	18:37 (10) 18:49 (10)	07:08 18:07	07:06 16:04	07:53 15:33	
12	08:00 15:59	07:16 16:55	06:15 17:48	7	17:15 (9) 17:22 (9)		06:02 19:44	05:00 20:37	04:26 21:16	04:39 21:13	05:26 20:26		06:18 19:16	13	18:35 (10) 18:48 (10)	07:10 18:05	07:08 16:02	07:54 15:35	
13	07:59 16:01	07:14 16:57	06:13 17:50	10	17:14 (9) 17:24 (9)		05:59 19:46	04:58 20:38	04:26 21:17	04:40 21:12	05:27 20:24		06:20 19:14	11	18:35 (10) 18:46 (10)	07:12 18:02	07:09 16:01	07:55 15:34	
14	07:59 16:02	07:12 16:59	06:10 17:52	13	17:13 (9) 17:26 (9)		05:57 19:48	04:56 20:40	04:25 21:18	04:42 21:12	05:29 20:22		06:22 19:11	10	18:34 (10) 18:44 (10)	07:14 18:00	07:11 15:59	07:56 15:34	
15	07:58 16:04	07:10 17:01	06:08 17:54	16	17:12 (9) 17:28 (9)	3	05:55 19:49	04:55 20:41	04:25 21:18	04:43 21:10	05:31 20:20		06:23 19:09	7	18:34 (10) 18:41 (10)	07:16 17:58	07:13 15:58	07:57 15:35	
16	07:57 16:05	07:08 17:03	06:06 17:56	18	17:12 (9) 17:30 (9)	5	05:53 19:51	04:53 20:43	04:25 21:19	04:44 21:09	05:32 20:18		06:25 19:07	5	18:34 (10) 18:39 (10)	07:17 17:56	07:15 15:56	07:58 15:35	
17	07:56 16:07	07:06 17:05	06:03 17:58	20	17:11 (9) 17:31 (9)	5	05:50 19:53	04:52 20:45	04:25 21:19	04:45 21:08	05:34 20:16		06:27 19:04	2	18:35 (10) 18:37 (10)	07:19 17:53	07:17 15:55	07:59 15:35	
18	07:55 16:09	07:04 17:07	06:01 17:59	18	17:12 (9) 17:30 (9)	6	05:48 19:55	04:50 20:46	04:25 21:20	04:47 21:07	05:36 20:14		06:28 19:02		07:21 17:51	07:18 15:53	08:00 15:35		
19	07:54 16:10	07:02 17:09	05:58 18:01	18	17:12 (9) 17:30 (9)	4	05:46 19:56	04:48 20:48	04:25 21:20	04:48 21:06	05:37 20:11		06:30 18:59		07:23 17:49	08:00 15:52	08:00 15:35		
20	07:53 16:12	07:00 17:11	05:56 18:03	16	17:12 (9) 17:28 (9)		05:44 19:58	04:47 20:49	04:25 21:20	04:49 21:05	05:39 20:09		06:32 18:57		07:25 17:47	08:01 15:51	08:01 15:36		
21	07:51 16:14	06:58 17:13	05:54 18:05	13	17:14 (9) 17:27 (9)		05:41 20:00	05:41 20:51	05:41 21:21	05:41 21:03	05:41 20:07		06:34 18:54	4	18:03 (9) 18:07 (9)	07:27 17:45	08:02 15:49	08:02 15:36	
22	07:50 16:16	06:56 17:15	05:51 18:07	7	17:16 (9) 17:23 (9)		05:39 20:02	05:39 20:52	04:45 21:21	05:42 21:02	05:43 20:05		06:35 18:52	12	17:59 (9) 18:11 (9)	07:28 17:42	08:02 15:48	08:02 15:36	
23	07:49 16:17	06:54 17:17	05:49 18:08		05:37 20:04		05:37 20:05	05:37 20:54	04:43 21:21	05:44 21:01	05:44 20:03		06:37 18:50	15	17:57 (9) 18:12 (9)	07:30 17:40	08:03 15:47	08:03 15:37	
24	07:48 16:19	06:52 17:19	05:47 18:10		05:35 20:05		05:35 20:05	05:35 20:55	04:42 21:21	05:45 21:09	05:46 20:00	5	06:39 19:30 (12)		17:56 (9) 18:13 (9)	07:32 17:38	08:03 15:46	08:03 15:38	
25	07:46 16:21	06:49 17:20	05:44 18:12		05:33 20:07		05:33 20:07	05:33 20:57	04:40 21:21	05:48 20:58	05:48 19:58	7	06:40 19:30 (12)		17:54 (9) 18:13 (9)	06:34 16:36	08:04 15:45	08:04 15:38	
26	07:45 16:23	06:47 17:22	05:42 18:14	2	05:31 17:49 (10)		05:31 20:09	05:31 20:56	04:26 21:21	05:48 20:56	05:49 19:56	5	06:42 19:28 (12)		17:54 (9) 18:13 (9)	06:36 16:34	08:04 15:44	08:04 15:39	
27	07:44 16:25	06:45 17:24	05:39 18:15	4	05:29 17:45 (10)		05:29 20:11	05:29 20:58	04:27 21:21	05:47 20:55	05:51 19:54	4	06:43 19:21 (12)		17:54 (9) 18:12 (9)	06:36 16:32	08:04 15:43	08:04 15:40	
28	07:42 16:27	06:43 17:26	05:37 18:17	7	05:26 17:44 (10)		05:26 20:12	05:26 21:01	04:37 21:21	05:01 20:53	05:53 19:51	2	06:46 19:23 (12)		17:53 (9) 18:09 (9)	06:40 16:30	08:05 15:42	08:05 15:40	
29	07:41 16:28	06:41 17:19	05:35 18:14	9	05:24 18:44 (10)		05:24 20:14	05:24 21:02	04:28 21:21	05:03 20:52	05:54 19:49		06:47 18:35	14	17:53 (9) 18:07 (9)	06:41 16:28	08:05 15:41	08:05 15:41	
30	07:39 16:30	06:32 17:21	05:22 18:11	11	05:22 18:43 (10)		05:22 20:16	05:22 21:03	04:29 21:20	05:04 20:50	05:56 19:47		06:49 18:33	12	17:53 (9) 18:05 (9)	06:43 16:26	08:05 15:40	08:05 15:42	
31	07:38 16:32	06:30 17:23	05:20 18:13	13	05:20 18:44 (10)		05:20 20:16	05:20 21:05	04:27 21:20	05:03 20:48	05:58 19:44		06:50 18:33		17:53 (9) 18:05 (9)	06:43 16:26	08:05 15:40	08:05 15:43	
Potential sun hours	254	275	367		418		490	505	507	457		382	256		330		262	238	
Total, worst case				205		86						23		13					

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

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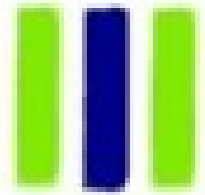
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** P - Shadow Receptor: 1.5 × 1.5 Azimuth: -102.2° Slope: 90.0° 17)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June
1	08:05	07:36	06:41	06:28	06:51 (11)	05:20
	15:45	16:34	17:28	19:25	06:54 (11)	20:18
2	08:05	07:35	06:38	06:25	06:48 (11)	05:18
	15:46	16:36	17:30	19:26	06:56 (11)	20:20
3	08:04	07:33	06:36	06:23	06:46 (11)	05:16
	15:47	16:38	17:32	19:28	06:58 (11)	20:21
4	08:04	07:31	06:34	06:20	06:44 (11)	05:15
	15:48	16:40	17:34	19:30	06:59 (11)	20:23
5	08:04	07:29	06:31	06:18	06:41 (11)	05:13
	15:49	16:42	17:36	19:32	06:59 (11)	20:25
6	08:04	07:28	06:29	06:16	06:39 (11)	05:11
	15:51	16:44	17:37	19:33	06:59 (11)	20:27
7	08:03	07:26	06:27	06:13	06:37 (11)	05:09
	15:52	16:46	17:39	19:35	07:00 (11)	20:28
8	08:03	07:24	06:25	06:11	06:36 (11)	05:07
	15:53	16:48	17:41	19:37	06:59 (11)	20:30
9	08:02	07:22	06:22	06:09	06:36 (11)	05:05
	15:55	16:50	17:43	19:39	06:59 (11)	20:32
10	08:02	07:20	06:20	06:43 (9)	06:06	06:37 (11)
	15:56	16:52	17:45	06:45 (9)	19:41	22 06:59 (11)
11	08:01	07:18	06:18	06:41 (9)	06:04	06:36 (11)
	15:58	16:54	17:47	06:45 (9)	19:42	21 06:57 (11)
12	08:00	07:16	06:15	06:39 (9)	06:02	06:37 (11)
	15:59	16:56	17:49	06:45 (9)	19:44	19 06:56 (11)
13	07:59	07:15	06:13	06:36 (9)	05:59	06:38 (11)
	16:01	16:58	17:50	06:44 (9)	19:46	17 06:55 (11)
14	07:59	07:13	06:11	06:34 (9)	05:57	06:39 (11)
	16:02	16:59	17:52	06:44 (9)	19:48	15 06:54 (11)
15	07:58	07:11	06:08	06:32 (9)	05:55	06:40 (11)
	16:04	17:01	17:54	06:41 (9)	19:49	10 06:50 (11)
16	07:57	07:09	06:06	06:36 (9)	05:53	04:53
	16:05	17:03	17:56	06:38 (9)	19:51	20:43
17	07:56	07:07	06:03	06:35	05:50	04:52
	16:07	17:05	17:58	06:37	19:53	20:45
18	07:55	07:04	06:01	06:34	05:48	04:50
	16:09	17:07	17:59	06:36	19:55	20:46
19	07:54	07:02	05:59	06:22 (10)	05:46	04:49
	16:10	17:09	18:01	06:24 (10)	19:57	20:48
20	07:53	07:00	05:56	06:19 (10)	05:44	04:47
	16:12	17:11	18:03	06:25 (10)	19:58	20:49
21	07:52	06:58	05:54	06:17 (10)	05:42	04:46
	16:14	17:13	18:05	06:26 (10)	20:00	20:51
22	07:50	06:56	05:51	06:15 (10)	05:39	04:44
	16:16	17:15	18:07	06:27 (10)	20:02	20:52
23	07:49	06:54	05:49	06:12 (10)	05:37	04:43
	16:18	17:17	18:08	06:26 (10)	20:04	20:54
24	07:48	06:52	05:47	06:10 (10)	05:35	04:42
	16:19	17:19	18:10	06:26 (10)	20:05	20:55
25	07:47	06:49	05:44	06:08 (10)	05:33	04:40
	16:21	17:21	18:12	06:25 (10)	20:07	20:57
26	07:45	06:47	05:42	06:09 (10)	05:31	04:39
	16:23	17:22	18:14	06:24 (10)	20:09	20:58
27	07:44	06:45	05:40	06:10 (10)	05:29	04:38
	16:25	17:24	18:16	06:23 (10)	20:11	21:00
28	07:42	06:43	05:37	06:11 (10)	05:27	04:37
	16:27	17:26	18:17	06:20 (10)	20:13	21:01
29	07:41		06:35	05:24	05:49 (12)	04:36
	16:29		19:19	20:14	05:56 (12)	21:02
30	07:39		06:32	05:22	05:47 (12)	04:35
	16:31		19:21	20:16	05:58 (12)	21:03
31	07:38		06:30			04:34
	16:32		19:23			21:05
Potential sun hours	254	275		418		505
Total, worst case			154	267	436	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

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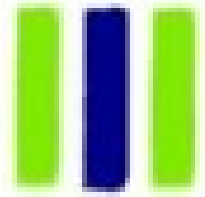
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** P - Shadow Receptor: 1.5 × 1.5 Azimuth: -102.2° Slope: 90.0° 17)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

July	August	September	October	November	December
1 04:29	05:08	05:47 (12) 06:00	06:36 (11) 06:51	07:17 (9) 06:47	07:40
21:20	25 20:47	06:12 (12) 19:42	21 06:57 (11) 18:31	7 07:24 (9) 16:22	15:40
2 04:30	05:09	05:48 (12) 06:01	06:34 (11) 06:53	07:19 (9) 06:49	07:42
21:20	25 20:45	06:13 (12) 19:40	23 06:57 (11) 18:28	5 07:24 (9) 16:20	15:39
3 04:31	05:11	05:47 (12) 06:03	06:34 (11) 06:54	07:20 (9) 06:51	07:43
21:20	26 20:43	06:13 (12) 19:38	23 06:57 (11) 18:26	3 07:23 (9) 16:18	15:38
4 04:32	05:12	05:47 (12) 06:05	06:33 (11) 06:56	06:53 07:45	15:38
21:19	26 20:41	06:13 (12) 19:35	23 06:56 (11) 18:23	16:16 15:38	15:38
5 04:32	05:14	05:47 (12) 06:07	06:33 (11) 06:58	06:55 07:46	15:37
21:19	25 20:40	06:12 (12) 19:33	23 06:56 (11) 18:21	16:15 15:37	15:37
6 04:33	05:16	05:47 (12) 06:08	06:35 (11) 07:00	06:57 07:47	15:36
21:18	26 20:38	06:13 (12) 19:31	21 06:56 (11) 18:19	16:13 15:36	15:36
7 04:34	05:17	05:47 (12) 06:10	06:36 (11) 07:02	06:58 07:49	15:36
21:17	25 20:36	06:12 (12) 19:28	18 06:54 (11) 18:16	16:11 15:36	15:36
8 04:35	05:19	05:48 (12) 06:12	06:38 (11) 07:03	07:00 07:50	15:36
21:17	24 20:34	06:12 (12) 19:26	15 06:53 (11) 18:14	16:09 15:36	15:36
9 04:36	05:21	05:50 (12) 06:13	06:40 (11) 07:05	07:02 07:51	15:35
21:16	21 20:32	06:11 (12) 19:23	12 06:52 (11) 18:12	16:07 15:35	15:35
10 04:37	05:22	05:51 (12) 06:15	06:41 (11) 07:07	07:04 07:52	15:35
21:15	19 20:30	06:10 (12) 19:21	8 06:49 (11) 18:09	16:06 15:35	15:35
11 04:38	05:24	05:53 (12) 06:17	06:43 (11) 07:09	07:06 07:53	15:35
21:14	16 20:28	06:09 (12) 19:19	4 06:47 (11) 18:07	16:04 15:35	15:35
12 04:39	05:26	05:54 (12) 06:18	07:10 07:54	07:08 07:54	15:35
21:14	13 20:26	06:07 (12) 19:16	18:05 15:35	16:02 15:35	15:35
13 04:41	05:27	05:56 (12) 06:20	07:12 07:56	07:10 07:56	15:35
21:13	10 20:24	06:06 (12) 19:14	18:02 15:35	16:01 15:35	15:35
14 04:42	05:29	05:58 (12) 06:22	07:14 07:57	07:11 07:57	15:35
21:12	6 20:22	06:04 (12) 19:11	18:00 15:35	15:59 15:35	15:35
15 04:43	05:31	06:24 07:16	07:02 (10) 07:16	07:13 07:57	15:35
21:11	20 20:20	19:09 17:58	8 07:10 (10) 17:58	15:58 15:35	15:35
16 04:44	05:32	06:25 07:18	06:59 (10) 07:18	07:15 07:58	15:35
21:10	20 20:18	19:07 17:56	12 07:11 (10) 17:56	15:56 15:35	15:35
17 04:46	05:34	06:27 07:19	06:57 (10) 07:19	07:17 07:59	15:35
21:08	20 20:16	19:04 17:53	15 07:12 (10) 17:53	15:55 15:35	15:35
18 04:47	05:36	06:29 07:21	06:57 (10) 07:21	07:19 08:00	15:35
21:07	20 20:14	19:02 17:51	16 07:13 (10) 17:51	15:54 15:35	15:35
19 04:48	05:38	06:30 07:23	06:56 (10) 07:23	07:20 08:01	15:35
21:06	20 20:12	18:59 17:49	17 07:13 (10) 17:49	15:52 15:35	15:35
20 04:50	05:39	06:32 07:25	06:58 (10) 07:25	07:22 08:01	15:36
21:05	20 20:09	18:57 17:47	15 07:13 (10) 17:47	15:51 15:36	15:36
21 04:51	05:41	06:34 07:27	07:00 (10) 07:27	07:24 08:02	15:36
21:04	20 20:07	18:55 17:45	12 07:12 (10) 17:45	15:50 15:36	15:36
22 04:52	05:58 (12) 05:43	06:35 07:29	07:01 (10) 07:29	07:26 08:02	15:37
21:02	3 06:01 (12) 20:05	18:52 17:43	10 07:11 (10) 17:43	15:48 15:37	15:37
23 04:54	05:55 (12) 05:44	06:37 07:30	07:03 (10) 07:30	07:27 08:03	15:37
21:01	9 06:04 (12) 20:03	18:50 17:40	7 07:10 (10) 17:40	15:47 15:37	15:37
24 04:55	05:54 (12) 05:46	06:39 07:32	07:05 (10) 07:32	07:29 08:03	15:38
20:59	13 06:07 (12) 20:01	18:47 17:38	4 07:09 (10) 17:38	15:46 15:38	15:38
25 04:57	05:52 (12) 05:48	06:41 06:34	06:34 06:34	07:31 08:04	15:38
20:58	16 06:08 (12) 19:58	18:45 16:36	16:36 16:36	15:45 15:38	15:38
26 04:58	05:52 (12) 05:49	06:42 06:36	06:36 06:36	07:32 08:04	15:39
20:56	17 06:09 (12) 19:56	18:43 16:34	16:34 16:34	15:44 15:39	15:39
27 05:00	05:50 (12) 05:51	06:44 06:38	06:38 06:38	07:34 08:04	15:40
20:55	20 06:10 (12) 19:54	18:40 16:32	16:32 16:32	15:43 15:40	15:40
28 05:01	05:49 (12) 05:53	06:46 06:40	07:15 (9) 06:40	07:36 08:05	15:41
20:53	21 06:10 (12) 19:52	10 06:52 (11) 18:38	7 07:22 (9) 16:30	15:42 15:41	15:41
29 05:03	05:49 (12) 05:55	06:40 (11) 06:48	07:13 (9) 06:42	07:37 08:05	15:41
20:52	23 06:12 (12) 19:49	15 06:55 (11) 18:35	10 07:23 (9) 16:28	15:41 15:41	15:41
30 05:04	05:48 (12) 05:56	06:38 (11) 06:49	07:15 (9) 06:43	07:39 08:05	15:42
20:50	24 06:12 (12) 19:47	17 06:55 (11) 18:33	9 07:24 (9) 16:26	15:40 15:42	15:42
31 05:06	05:48 (12) 05:58	06:37 (11) 06:45	06:45 06:45	08:05 08:05	15:43
20:48	24 06:12 (12) 19:45	19 06:56 (11) 16:24	16:24 16:24	15:43 15:43	238
Potential sun hours 507	457	382	330	262	238
Total, worst case 170	348	333	15		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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10/08/2010 5:41 PM / 22

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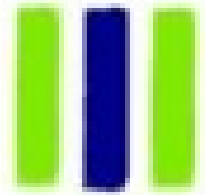
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** Q - Shadow Receptor: 1.5 × 1.5 Azimuth: 88.3° Slope: 90.0° (18)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December				
1	08:05 15:45	07:36 16:34	15:44 (2) 16:03 (2)	06:40 17:28	16:33 (1) 16:45 (1)	06:28 19:24	05:20 20:18	04:33 21:06	04:29 21:20	05:08 20:47	06:00 19:42	06:51 18:30	06:47 16:22	07:40 15:40		
2	08:04 15:46	07:34 16:36	15:44 (2) 16:03 (2)	06:38 17:30	16:37 (1) 16:42 (1)	06:25 19:26	05:18 20:19	04:32 21:07	04:30 21:20	05:09 20:45	06:01 19:40	06:53 18:28	06:49 16:20	07:42 15:39		
3	08:04 15:47	07:33 16:38	15:45 (2) 16:03 (2)	06:36 17:32		06:23 19:28	05:16 20:21	04:31 21:08	04:31 21:19	05:11 20:43	06:03 19:38	06:54 18:26	06:51 16:18	7 15:21 (2)	07:43 15:38	
4	08:04 15:48	07:31 16:40	15:46 (2) 16:04 (2)	06:34 17:34		06:20 19:30	05:15 20:23	04:30 21:09	04:32 21:19	05:12 20:41	06:05 19:35	06:56 18:23	06:53 16:16	11 15:30 (2)	07:44 15:38	
5	08:04 15:49	07:29 16:42	15:47 (2) 16:03 (2)	06:31 17:36		06:18 19:32	05:13 20:25	04:30 21:10	04:32 21:18	05:14 20:39	06:06 19:33	06:58 18:21	06:54 16:14	15 15:32 (2)	07:46 15:37	
6	08:03 15:51	07:27 16:44	15:48 (2) 16:02 (2)	06:29 17:37		06:16 19:33	05:11 20:26	04:29 21:11	04:33 21:18	05:16 20:38	06:08 19:30	07:00 18:19	06:56 16:13	17 15:33 (2)	07:47 15:37	
7	08:03 15:52	07:26 16:46	15:49 (2) 16:01 (2)	06:27 17:39		06:13 19:35	05:09 20:28	04:28 21:12	04:34 21:17	05:17 20:36	06:10 19:28	07:01 18:16	06:58 16:11	17 15:33 (2)	07:48 15:36	
8	08:02 15:53	07:24 16:48	15:52 (2) 15:58 (2)	06:24 17:41		06:11 19:37	05:07 20:30	04:28 21:13	04:35 21:17	05:19 20:34	06:12 19:26	07:03 18:14	07:00 16:09	19 15:15 (2)	07:50 15:36	
9	08:02 15:55	07:22 16:50		06:22 17:43		06:09 19:39	05:05 20:31	04:27 21:14	04:36 21:16	05:21 20:32	06:13 19:23	07:05 18:12	07:02 16:07	19 15:15 (2)	07:51 15:35	
10	08:01 15:56	07:20 16:52		06:20 17:45		06:06 19:40	05:03 20:33	04:27 21:15	04:37 21:15	05:22 20:30	06:15 19:21	07:07 18:09	07:04 16:06	19 15:15 (2)	07:52 15:35	
11	08:01 15:58	07:18 16:54		06:17 17:47		06:04 19:42	05:02 20:35	04:26 21:15	04:38 21:14	05:24 20:28	06:17 19:19	07:08 18:07	07:06 16:04	17 15:15 (2)	07:53 15:35	
12	08:00 15:59	07:16 16:56		06:15 17:48		06:02 19:44	05:00 20:36	04:26 21:16	04:39 21:13	05:26 20:26	06:18 19:16	07:10 18:05	9 17:09 (1)	07:08 16:02	14 15:16 (2)	07:54 15:35
13	07:59 16:01	07:14 16:58		06:13 17:50		05:59 19:46	04:58 20:38	04:26 21:17	04:41 21:12	05:27 20:24	06:20 19:14	07:12 18:02	13 17:19 (1)	07:09 16:01	13 15:16 (2)	07:55 15:35
14	07:58 16:02	07:12 16:59		06:10 17:52		05:57 19:48	04:56 20:40	04:25 21:18	04:42 21:11	05:29 20:22	06:22 19:11	07:14 18:00	16 17:20 (1)	07:11 15:59	10 15:17 (2)	07:56 15:35
15	07:58 16:04	07:10 17:01		06:08 17:54		05:55 19:49	04:55 20:41	04:25 21:18	04:43 21:10	05:31 20:20	06:23 19:09	07:16 17:58	18 17:21 (1)	07:13 15:58	8 15:17 (2)	07:57 15:35
16	07:57 16:05	07:08 17:03		06:06 17:56		05:53 19:51	04:53 20:43	04:25 21:19	04:44 21:09	05:32 20:18	06:25 19:07	07:17 17:56	20 17:22 (1)	07:15 15:56	6 15:18 (2)	07:58 15:35
17	07:56 16:07	07:06 17:05		06:03 17:58		05:50 19:53	04:52 20:45	04:25 21:19	04:46 21:08	05:34 20:16	06:27 19:04	07:19 17:53	20 17:22 (1)	07:17 15:55	2 15:20 (2)	07:59 15:35
18	07:55 16:09	07:04 17:07	16:35 (1) 16:39 (1)	06:01 17:59		05:48 19:55	04:50 20:46	04:25 21:20	04:47 21:07	05:36 20:14	06:29 19:02	07:21 17:51	20 17:02 (1)	07:18 15:54		08:00 15:35
19	07:54 16:11	07:02 17:09	16:33 (1) 16:41 (1)	05:59 18:01		05:46 19:56	04:49 20:48	04:25 21:20	04:48 21:06	05:38 20:11	06:30 18:59	07:23 17:49	18 17:20 (1)	07:20 15:52		08:00 15:35
20	07:53 16:12	07:00 17:11	16:33 (1) 16:43 (1)	05:56 18:03		05:44 19:58	04:47 20:49	04:25 21:20	04:50 21:05	05:39 20:09	06:32 18:57	07:25 17:47	16 17:02 (1)	07:22 15:51		08:01 15:36
21	07:51 16:14	06:58 17:13	16:32 (1) 16:46 (1)	05:54 18:05		05:41 20:00	04:46 20:51	04:25 21:20	04:51 21:03	05:41 20:07	06:34 18:54	07:27 17:45	13 17:15 (1)	07:24 15:50		08:02 15:36
22	07:50 16:16	06:56 17:15	16:30 (1) 16:47 (1)	05:51 18:07		05:39 20:02	04:44 20:52	04:25 21:21	04:52 21:02	05:43 20:05	06:35 18:52	07:28 17:42	10 17:03 (1)	07:25 15:48		08:02 15:37
23	07:49 16:18	06:54 17:17	16:30 (1) 16:49 (1)	05:49 18:08		05:37 20:04	04:43 20:54	04:26 21:21	04:54 21:01	05:44 20:03	06:37 18:50	07:30 17:40	7 17:11 (1)	07:27 15:47		08:03 15:37
24	07:48 16:19	06:52 17:19	16:30 (1) 16:51 (1)	05:47 18:10		05:35 20:05	04:42 20:55	04:26 21:21	04:55 20:59	05:46 20:00	06:39 18:47	07:32 17:38	3 17:09 (1)	07:29 15:46		08:03 15:38
25	07:46 16:21	15:47 (2) 15:49 (2)	06:49 17:21	16:31 (1) 18:12		05:33 20:07	04:40 20:57	04:26 21:21	04:57 20:58	05:48 19:58	06:41 18:45	06:34 16:36		07:31 15:45		08:04 15:38
26	07:45 16:23	15:46 (2) 15:51 (2)	06:47 17:22	16:30 (1) 18:14		05:31 20:09	04:39 20:58	04:27 21:21	04:58 20:56	05:49 19:56	06:42 18:42	06:36 16:34		07:32 15:44		08:04 15:39
27	07:44 16:25	15:45 (2) 15:52 (2)	06:45 17:24	16:31 (1) 18:16		05:29 20:11	04:38 20:59	04:27 21:21	05:00 20:55	05:51 19:54	06:44 18:40	06:38 16:32		07:34 15:43		08:04 15:40
28	07:42 16:27	15:45 (2) 15:55 (2)	06:43 17:26	16:33 (1) 18:17		05:27 20:12	04:37 21:01	04:28 21:21	05:01 20:53	05:53 19:51	06:46 18:38	06:40 16:30		07:35 15:42		08:04 15:41
29	07:41 16:29	15:44 (2) 15:57 (2)		06:35 19:19		05:24 20:14	04:36 21:02	04:28 21:21	05:03 20:52	05:55 19:49	06:47 18:35	06:41 16:28		07:37 15:41		08:04 15:42
30	07:39 16:31	15:44 (2) 15:59 (2)		06:32 19:21		05:22 20:16	04:35 21:03	04:29 21:20	05:04 20:50	05:56 19:47	06:49 18:33	06:43 16:26		07:39 15:40		08:05 15:42
31	07:38 16:32	15:44 (2) 16:02 (2)		06:30 19:23		04:34 19:23	04:34 21:04		05:06 20:48	05:58 19:44		06:45 16:24				08:05 15:43
Potential sun hours	254		275			418	490	505	507	457	382	330		263		238
Total, worst case	70	287		17								183	194			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Pawlowo_Golancz_miasto_07102010

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10/08/2010 5:41 PM / 23

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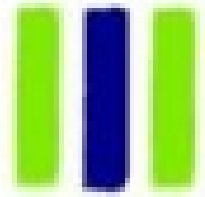
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:**

R - Shadow Receptor: 1.5 × 1.5 Azimuth: 88.3° Slope: 90.0° (19)

Assumptions for shadow calculations

Maximum distance for influence 2,000 m

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:05 15:45	9 14:44 (2) 14:53 (2)	07:36 06:40 17:28	06:28 19:24	05:20 20:18	04:33 21:06	04:29 21:20	05:08 20:47	06:00 19:42	06:51 18:30	06:47 16:22	07:40 15:40
2	08:04 15:46	8 14:45 (2) 14:53 (2)	07:34 06:38 17:30	06:25 19:26	05:18 20:19	04:32 21:07	04:30 21:20	05:09 20:45	06:01 19:40	06:53 18:28	06:49 16:20	07:42 15:39
3	08:04 15:47	6 14:47 (2) 14:53 (2)	07:33 06:36 17:32	06:23 19:28	05:16 20:21	04:31 21:08	04:31 21:19	05:11 20:43	06:03 19:38	06:54 18:26	06:51 16:18	07:43 15:38
4	08:04 15:48	4 14:48 (2) 14:52 (2)	07:31 06:34 17:34	06:20 19:30	05:14 20:23	04:30 21:09	04:32 21:19	05:12 20:41	06:05 19:35	06:56 18:23	06:53 16:16	07:44 15:38
5	08:04 15:49		07:29 06:31 17:36	06:18 19:32	05:13 20:25	04:30 21:10	04:32 21:18	05:14 20:39	06:06 19:33	06:58 18:21	06:55 16:14	07:46 15:37
6	08:03 15:51		07:27 06:29 17:37	06:16 19:33	05:11 20:26	04:29 21:11	04:33 21:18	05:16 20:38	06:08 19:30	07:00 18:19	06:56 16:13	07:47 15:37
7	08:03 15:52		07:26 06:27 17:39	06:13 19:35	05:09 20:28	04:28 21:12	04:34 21:17	05:17 20:36	06:10 19:28	07:01 18:16	06:58 16:11	07:48 15:36
8	08:02 15:53		07:24 06:28 17:41	06:11 19:37	05:07 20:30	04:28 21:13	04:35 21:17	05:19 20:34	06:12 19:26	07:03 18:14	07:00 16:09	07:50 15:36
9	08:02 15:55		07:22 06:22 17:43	06:09 19:39	05:05 20:31	04:27 21:14	04:36 21:16	05:21 20:32	06:13 19:23	07:05 18:12	07:02 16:07	07:51 15:35
10	08:01 15:56		07:20 06:20 17:45	06:06 19:40	05:03 20:33	04:27 21:15	04:37 21:15	05:22 20:30	06:15 19:21	07:07 18:09	07:04 16:06	07:52 15:35
11	08:01 15:58		07:18 06:17 17:47	06:04 19:42	05:02 20:35	04:26 21:15	04:38 21:14	05:24 20:28	06:17 19:19	07:08 18:07	07:06 16:04	07:53 15:35
12	08:00 15:59		07:16 06:15 17:48	06:02 19:44	05:00 20:37	04:26 21:16	04:39 21:13	05:26 20:26	06:18 19:16	07:10 18:05	07:08 16:02	07:54 15:35
13	07:59 16:01		07:14 06:13 17:50	05:59 19:46	04:58 20:38	04:26 21:17	04:41 21:12	05:27 20:24	06:20 19:14	07:12 18:02	07:09 16:01	07:55 15:35
14	07:58 16:02	2 15:26 (1) 15:28 (1)	07:12 06:10 16:59	05:57 19:48	04:56 20:40	04:25 21:18	04:42 21:11	05:29 20:22	06:22 19:11	07:14 18:00	07:11 15:59	07:56 15:35
15	07:58 16:04	4 15:26 (1) 15:30 (1)	07:10 06:08 17:01	05:55 19:49	04:55 20:41	04:25 21:18	04:43 21:10	05:31 20:20	06:23 19:09	07:16 17:58	07:13 15:58	07:57 15:35
16	07:57 16:05	7 15:25 (1) 15:32 (1)	07:08 06:06 17:03	05:53 19:51	04:53 20:43	04:25 21:19	04:44 21:09	05:32 20:18	06:25 19:07	07:17 17:56	07:15 15:56	07:58 15:35
17	07:56 16:07	9 15:24 (1) 15:33 (1)	07:06 06:03 17:05	05:50 19:53	04:52 20:45	04:25 21:19	04:46 21:08	05:34 20:16	06:27 19:04	07:19 17:53	07:17 15:55	07:59 15:35
18	07:55 16:09	11 15:24 (1) 15:35 (1)	07:04 06:01 17:07	05:48 19:55	04:50 20:46	04:25 21:20	04:47 21:07	05:36 20:14	06:29 19:02	07:21 17:51	07:18 15:54	08:00 15:35
19	07:54 16:10	12 15:25 (1) 15:37 (1)	07:02 06:59 17:09	05:46 19:56	04:49 20:48	04:25 21:20	04:48 21:06	05:38 20:11	06:30 18:59	07:23 17:49	07:20 15:52	08:00 15:35
20	07:53 16:12	14 15:25 (1) 15:39 (1)	07:00 06:56 17:11	05:44 19:58	04:47 20:49	04:25 21:20	04:50 21:05	05:39 20:09	06:32 18:57	07:25 17:47	07:22 15:51	08:01 15:36
21	07:51 16:14	15 15:25 (1) 15:40 (1)	06:58 05:54 17:13	05:41 19:58	04:46 20:51	04:25 21:21	04:51 21:03	05:41 20:07	06:34 18:54	07:27 17:45	07:24 15:50	08:02 15:36
22	07:50 16:16	18 15:25 (1) 15:43 (1)	06:56 05:51 17:15	05:39 20:02	04:44 20:52	04:25 21:21	04:52 21:02	05:43 20:05	06:35 18:52	07:28 17:42	07:25 15:48	08:02 15:37
23	07:49 16:18	18 15:26 (1) 15:44 (1)	06:54 05:49 17:17	05:37 20:04	04:43 20:54	04:26 21:21	04:54 21:01	05:44 20:03	06:37 18:50	07:30 17:40	07:27 15:47	08:03 15:37
24	07:48 16:19	18 15:26 (1) 15:44 (1)	06:52 05:47 17:19	05:35 20:05	04:42 20:55	04:26 21:21	04:55 20:59	05:46 20:00	06:39 18:47	07:32 17:38	07:29 15:46	08:03 15:38
25	07:46 16:21	17 15:27 (1) 15:44 (1)	06:49 05:44 17:21	05:33 20:07	04:40 20:57	04:26 21:21	04:57 20:58	05:48 19:58	06:41 18:45	06:34 16:36	07:31 15:45	08:04 15:38
26	07:45 16:23	17 15:27 (1) 15:44 (1)	06:47 05:42 17:22	05:31 20:09	04:39 20:58	04:27 21:21	04:58 20:56	05:49 19:56	06:42 18:42	06:36 16:34	07:32 15:44	08:04 15:39
27	07:44 16:25	15 15:28 (1) 15:43 (1)	06:45 05:39 17:24	05:29 20:11	04:38 20:59	04:27 21:21	05:00 20:55	05:51 19:54	06:44 18:40	06:46 16:32	07:34 15:43	08:04 15:40
28	07:42 16:27	14 15:29 (1) 15:43 (1)	06:43 05:37 17:26	05:27 20:12	04:37 21:01	04:28 21:21	05:01 20:53	05:53 19:51	06:46 18:38	06:40 16:30	07:35 15:42	08:04 15:41
29	07:41 16:29	12 15:30 (1) 15:42 (1)	06:43 05:35 17:26	05:24 20:14	04:36 21:02	04:28 21:21	05:03 20:52	05:55 19:49	06:47 18:35	06:41 16:28	07:37 15:41	08:04 15:42
30	07:39 16:31	8 15:32 (1) 15:40 (1)	06:42 05:32 19:21	05:22 20:16	04:35 21:03	04:29 21:20	05:04 20:50	05:56 19:47	06:49 18:33	06:43 16:26	07:39 15:40	08:05 15:42
31	07:38 16:32		06:30 19:23	05:24 21:04	04:34 21:04		05:06 20:48	05:58 19:45		06:45 16:24		08:05 15:43
Potential sun hours	254	275	367	418	490	505	507	457	382	330	262	238
Total, worst case	238										211	278

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Pawlowo_Golancz_miasto_07102010

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10/08/2010 5:41 PM / 24

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EMPEKO

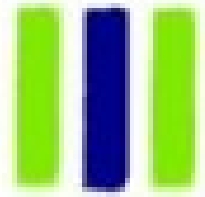
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** S - Shadow Receptor: 1.5 × 1.5 Azimuth: 88.3° Slope: 90.0° (29)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December															
1	08:05 15:45	14:46 (2) 15:02 (2)	07:36 16:34	15:37 (1) 15:51 (1)	06:40 17:28	06:28 19:24	05:20 20:18	04:33 21:06	04:29 21:20	05:08 20:47	06:00 19:42	06:51 18:30	06:47 16:22	07:40 15:40													
2	08:04 15:46	14:47 (2) 15:02 (2)	07:34 16:36	15:38 (1) 15:49 (1)	06:38 17:30	06:25 19:26	05:18 20:19	04:32 21:07	04:30 21:20	05:09 20:45	06:01 19:40	06:53 18:28	06:49 16:20	07:42 15:39	14:39 (2) 4 14:43 (2)												
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31	07:38 16:32		07:13 17:29		06:30 19:23		04:34 21:04		05:06 20:48	05:58 19:45		06:45 16:24		08:05 15:43	14:46 (2) 16 15:02 (2)												
Potential sun hours	254		275		367		418		490		505		507		457		382		330		262		204		238		445
Total, worst case		288		32																			204				

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	(WTG causing flicker first time)
Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Pawlowo_Golancz_miasto_07102010

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10/08/2010 5:41 PM / 25

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EMPEKO

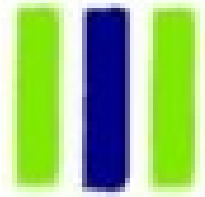
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** T - Shadow Receptor: 1.5 × 1.5 Azimuth: 88.3° Slope: 90.0° (2)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:05 15:45	8 14:45 (2) 14:53 (2)	07:36 17:28	06:40 17:28	06:28 19:24	05:20 20:18	04:33 21:06	04:29 21:20	05:08 20:47	06:00 19:42	06:51 18:30	06:47 16:22
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12	08:00 15:59		07:16 16:56	06:15 17:48	06:02 19:44	05:00 20:37	04:26 21:16	04:39 21:13	05:26 20:26	06:18 19:16	07:10 18:05	07:08 16:02
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15	07:58 16:04	4	15:26 (1) 15:30 (1)	07:10 17:01	06:08 17:54	05:55 19:49	04:55 20:41	04:25 21:18	04:43 21:10	06:23 20:20	07:16 17:58	07:13 15:58
16	07:57 16:05	6	15:26 (1) 15:32 (1)	07:08 17:03	06:06 17:56	05:53 19:51	04:53 20:43	04:25 21:19	04:44 21:09	06:25 20:18	07:17 17:56	07:15 15:56
17	07:56 16:07	8	15:25 (1) 15:33 (1)	07:06 17:05	06:03 17:58	05:50 19:53	04:52 20:45	04:25 21:19	04:46 21:08	06:27 20:16	07:19 17:53	07:17 15:55
18	07:55 16:09	10	15:25 (1) 15:35 (1)	07:04 17:07	06:01 17:59	05:48 19:55	04:50 20:46	04:25 21:20	04:47 21:07	06:29 20:14	07:21 17:51	07:18 15:54
19	07:54 16:10	12	15:25 (1) 15:37 (1)	07:02 17:09	05:59 18:01	05:46 19:56	04:49 20:48	04:25 21:20	04:48 21:06	06:30 20:11	07:23 18:59	07:20 15:52
20	07:53 16:12	13	15:26 (1) 15:39 (1)	07:00 17:11	05:56 18:03	05:44 19:58	04:47 20:49	04:25 21:20	04:50 21:05	06:32 20:09	07:25 18:57	07:22 15:51
21	07:51 16:14	15	15:25 (1) 15:40 (1)	06:58 17:13	05:54 18:05	05:41 20:00	04:46 20:51	04:25 21:21	04:51 21:03	06:34 20:07	07:27 18:54	07:24 15:50
22	07:50 16:16	17	15:26 (1) 15:43 (1)	06:56 17:15	05:51 18:07	05:39 20:02	04:44 20:52	04:25 21:21	04:52 21:02	06:35 20:05	07:28 18:52	07:25 15:48
23	07:49 16:18	18	15:27 (1) 15:45 (1)	06:54 17:17	05:49 18:08	05:37 20:04	04:43 20:54	04:26 21:21	04:54 21:01	06:37 20:03	07:30 18:50	07:27 15:40
24	07:48 16:19	19	15:27 (1) 15:44 (1)	06:52 17:19	05:47 18:10	05:35 20:05	04:42 20:55	04:26 21:21	04:55 20:59	06:39 20:00	07:32 18:47	07:29 15:38
25	07:46 16:21	17	15:28 (1) 15:45 (1)	06:49 17:21	05:44 18:12	05:33 20:07	04:40 20:57	04:26 21:21	04:57 20:58	06:41 18:45	07:34 16:36	07:31 15:45
26	07:45 16:23	16	15:28 (1) 15:44 (1)	06:47 17:22	05:42 18:14	05:31 20:09	04:39 20:58	04:27 21:21	04:58 20:56	06:42 18:42	07:36 16:34	07:32 15:44
27	07:44 16:25	14	15:29 (1) 15:43 (1)	06:45 17:24	05:39 18:16	05:29 20:11	04:38 20:59	04:27 21:21	05:00 20:55	06:44 18:40	07:37 16:32	07:34 15:43
28	07:42 16:27	13	15:30 (1) 15:43 (1)	06:43 17:26	05:37 18:17	05:27 20:12	04:37 21:01	04:28 21:21	05:01 20:53	06:46 19:51	07:35 16:30	07:32 15:42
29	07:41 16:29	10	15:32 (1) 15:42 (1)	06:35 17:19	05:24 18:10	05:24 20:14	04:36 21:02	04:28 21:21	05:03 20:52	06:47 19:49	07:37 16:28	07:37 15:41
30	07:39 16:31	5	15:34 (1) 15:39 (1)	06:32 17:21	05:22 18:16	05:22 20:16	04:35 21:03	04:29 21:20	05:04 20:50	06:49 19:47	07:39 16:26	07:39 15:40
31	07:38 16:32			06:30 19:23			04:34 21:04		05:06 20:48	06:58 19:45	06:45 16:24	
Potential sun hours	254		275	367	418	490	505	507	457	382	330	262
Total, worst case		217									199	255

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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10/08/2010 5:41 PM / 26

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Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

SHADOW - Calendar

Calculation: Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal

Shadow receptor: U - Shadow Receptor: 1.5×1.5 Azimuth: 88.3° Slope: 90.0° (22)

Assumptions for shadow calculations

Maximum distance for influence	2,000 m
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Minimum sun height over horizon for influence

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

		January	February	March	April	May	June	July	August	September	October	November	December	
1	08:05	14:46 (2)	07:36	06:40	06:28	05:20	04:33	04:29	05:08	06:00	06:51	06:47	07:40	
	15:45	6	14:52 (2)	16:34	17:28	20:18	21:06	21:20	20:47	19:42	18:30	16:22	15:40	
2	08:04	14:49 (2)	07:34	06:38	06:25	05:18	04:32	04:30	05:09	06:01	06:53	06:49	07:42	
	15:46	2	14:51 (2)	16:36	17:30	20:26	20:19	21:07	21:20	20:45	19:40	18:28	16:20	15:39
3	08:04		07:33	06:36	06:23	05:16	04:31	04:31	05:11	06:03	06:54	06:51	07:43	
	15:47		16:38	17:32	19:28	20:21	21:08	21:19	20:43	19:38	18:26	16:18	15:38	
4	08:04		07:31	06:34	06:20	05:14	04:30	04:32	05:12	06:05	06:56	06:53	07:44	
	15:48		16:40	17:34	19:30	20:23	21:09	21:19	20:41	19:35	18:23	16:16	15:38	
5	08:04		07:29	06:31	06:18	05:13	04:30	04:32	05:14	06:06	06:58	06:55	07:46	
	15:49		16:42	17:36	19:32	20:25	21:10	21:18	20:39	19:33	18:21	16:14	15:37	
6	08:03		07:27	06:29	06:16	05:11	04:29	04:33	05:16	06:08	07:00	06:56	07:47	
	15:51		16:44	17:37	19:33	20:26	21:11	21:18	20:38	19:30	18:19	16:13	15:37	
7	08:03		07:26	06:27	06:13	05:09	04:28	04:34	05:17	06:10	07:01	06:58	07:48	
	15:52		16:46	17:39	19:35	20:28	21:12	21:17	20:36	19:28	18:16	16:11	15:36	
8	08:02		07:24	06:24	06:11	05:07	04:28	04:35	05:19	06:12	07:03	07:00	07:50	
	15:53		16:48	17:41	19:37	20:30	21:13	21:17	20:34	19:26	18:14	16:09	15:36	
9	08:02		07:22	06:22	06:09	05:05	04:27	04:36	05:21	06:13	07:05	07:02	07:51	
	15:55		16:50	17:43	19:39	20:31	21:14	21:16	20:32	19:23	18:12	16:07	15:35	
10	08:01		07:20	06:20	06:06	05:03	04:27	04:37	05:22	06:15	07:07	07:04	07:52	14:38 (2)
	15:56		16:52	17:45	19:40	20:33	21:15	21:15	20:30	19:21	18:09	16:06	15:35	2
11	08:01		07:18	06:17	06:04	05:02	04:26	04:38	05:24	06:17	07:08	07:06	07:53	14:37 (2)
	15:58		16:54	17:47	19:42	20:35	21:15	21:14	20:28	19:19	18:07	16:04	15:35	5
12	08:00		07:16	06:15	06:02	05:00	04:26	04:39	05:26	06:18	07:10	07:08	07:54	14:37 (2)
	15:59		16:56	17:48	19:44	20:37	21:16	21:13	20:26	19:16	18:05	16:02	15:35	7
13	07:59		07:14	06:13	05:59	04:58	04:26	04:41	05:27	06:20	07:12	07:09	07:55	14:37 (2)
	16:01		16:58	17:50	19:46	20:38	21:17	21:12	20:24	19:14	18:02	16:01	15:35	8
14	07:58		15:26 (1)	07:12	06:10	05:57	04:56	04:25	04:42	05:29	06:22	07:14	07:11	15:03 (1)
	16:02	2	15:28 (1)	16:59	17:52	19:48	20:40	21:18	21:11	20:22	19:11	18:00	15:59	11
15	07:58		15:25 (1)	07:10	06:08	05:55	04:55	04:25	04:43	05:31	06:23	07:16	07:13	15:02 (1)
	16:04	5	15:30 (1)	17:01	17:54	19:49	20:41	21:18	21:10	20:20	19:09	17:58	15:58	14
16	07:57		15:25 (1)	07:08	06:06	05:53	04:53	04:25	04:44	05:32	06:25	07:17	07:15	15:01 (1)
	16:05	7	15:32 (1)	17:03	17:56	19:51	20:43	21:19	21:09	20:18	19:07	17:56	15:56	16
17	07:56		15:25 (1)	07:06	06:03	05:50	04:52	04:25	04:46	05:34	06:27	07:19	07:17	15:01 (1)
	16:07	8	15:33 (1)	17:05	17:58	19:53	20:45	21:19	21:08	20:16	19:04	17:53	15:55	17
18	07:55		15:25 (1)	07:04	06:01	05:48	04:50	04:25	04:47	05:36	06:29	07:21	07:18	15:01 (1)
	16:09	10	15:35 (1)	17:07	17:59	19:55	20:46	21:20	21:07	20:14	19:02	17:51	15:54	17
19	07:54		15:25 (1)	07:02	05:59	05:46	04:49	04:25	04:48	05:38	06:30	07:23	07:20	15:01 (1)
	16:10	12	15:37 (1)	17:09	18:01	19:56	20:48	21:20	21:06	20:11	18:59	17:49	15:52	18
20	07:53		15:26 (1)	07:00	05:56	05:44	04:47	04:25	04:50	05:39	06:32	07:25	07:22	15:01 (1)
	16:12	13	15:39 (1)	17:11	18:03	19:58	20:49	21:20	21:05	20:09	18:57	17:47	15:51	17
21	07:51		15:25 (1)	06:58	05:54	05:41	04:46	04:25	04:51	05:41	06:34	07:27	07:24	15:01 (1)
	16:14	15	15:40 (1)	17:13	18:05	20:00	20:51	21:21	21:03	20:07	18:54	17:45	15:50	15
22	07:50		15:26 (1)	06:56	05:51	05:39	04:44	04:25	04:52	05:43	06:35	07:28	07:25	15:02 (1)
	16:16	17	15:43 (1)	17:15	18:07	20:02	20:52	21:21	21:02	20:05	18:52	17:42	15:48	13
23	07:49		15:27 (1)	06:54	05:49	05:37	04:43	04:26	04:54	05:44	06:37	07:30	07:27	15:02 (1)
	16:18	18	15:45 (1)	17:17	18:08	20:04	20:54	21:21	21:01	20:03	18:50	17:40	15:47	12
24	07:48		15:27 (1)	06:52	05:47	05:35	04:42	04:26	04:55	05:46	06:39	07:32	07:29	15:02 (1)
	16:19	17	15:44 (1)	17:19	18:10	20:05	20:55	21:21	20:59	20:00	18:47	17:38	15:46	10
25	07:46		15:28 (1)	06:49	05:44	05:33	04:40	04:26	04:57	05:48	06:41	06:34	07:31	15:03 (1)
	16:21	17	15:45 (1)	17:21	18:12	20:07	20:57	21:21	20:58	19:58	18:45	16:36	15:45	8
26	07:45		15:28 (1)	06:47	05:42	05:31	04:39	04:27	04:58	05:49	06:42	06:36	07:32	15:04 (1)
	16:23	16	15:44 (1)	17:22	18:14	20:09	20:58	21:21	20:56	19:56	18:42	16:34	15:44	6
27	07:44		15:29 (1)	06:45	05:39	05:29	04:38	04:27	05:00	05:51	06:44	06:38	07:34	15:05 (1)
	16:25	14	15:43 (1)	17:24	18:16	20:11	20:59	21:21	20:55	19:54	18:40	16:32	15:43	4
28	07:42		15:31 (1)	06:43	05:37	05:27	04:37	04:28	05:01	05:53	06:46	06:40	07:35	15:06 (1)
	16:27	11	15:42 (1)	17:26	18:17	20:12	21:01	21:21	20:53	19:51	18:38	16:30	15:42	2
29	07:41		15:33 (1)		06:35	05:24	04:36	04:28	05:03	05:55	06:47	06:41	07:37	
	16:29	8	15:41 (1)		19:19	20:14	21:02	21:21	20:52	19:49	18:35	16:28	15:41	
30	07:39				06:32	05:22	04:35	04:29	05:04	05:56	06:49	06:43	07:39	
	16:31				19:21	20:16	21:03	21:20	20:50	19:47	18:33	16:26	15:40	
31	07:38				06:30		04:34		05:06	05:58		06:45		
	16:32				19:23		21:04		20:48	19:45		16:24		
Potential sun hours	254		275	367	418	490	505	507	457	382	330	262	238	
Total worst case	198										188		211	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker
			(WTG causing flicker last time)

Project:

Pawlowo_Golancz_miasto_07102010

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10/08/2010 5:41 PM / 27

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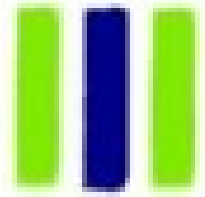
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** V - Shadow Receptor: 1.5 × 1.5 Azimuth: 65.5° Slope: 90.0° (29)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January		February		March		April		May		June	
1	08:04		07:36		06:40		06:27	18:53 (2)	05:20		04:33	
	15:45		16:34		17:28		19:24	6 18:59 (2)	20:18		21:06	
2	08:04		07:34		06:38		06:25	18:52 (2)	05:18		04:32	
	15:46		16:36		17:30		19:26	8 19:00 (2)	20:19		21:07	
3	08:04		07:33		06:36		06:23	18:53 (2)	05:16		04:31	
	15:47		16:38		17:32		19:28	9 19:02 (2)	20:21		21:08	
4	08:04		07:31		06:34		06:20	18:54 (2)	05:14		04:30	
	15:48		16:40		17:34		19:30	8 19:02 (2)	20:23		21:09	
5	08:04		07:29		06:31		06:18		05:13		04:30	
	15:49		16:42		17:36		19:32		20:25		21:10	
6	08:03	15:13 (5)	07:27		06:29		06:16		05:11		04:29	
	15:51	2 15:15 (5)	16:44		17:37		19:33		20:26		21:11	
7	08:03	15:14 (5)	07:26		06:27		06:13		05:09		04:28	
	15:52	3 15:17 (5)	16:46		17:39		19:35		20:28		21:12	
8	08:02	15:13 (5)	07:24		06:24		06:11		05:07		04:28	
	15:53	5 15:18 (5)	16:48		17:41		19:37		20:30		21:13	
9	08:02	15:13 (5)	07:22		06:22		06:09		05:05		04:27	
	15:55	6 15:19 (5)	16:50		17:43		19:39		20:31		21:14	
10	08:01	15:13 (5)	07:20		06:20		17:17 (3) 06:06		05:03		04:27	
	15:56	8 15:21 (5)	16:52		17:45	2 17:19 (3)	19:40		20:33		21:15	
11	08:01	15:13 (5)	07:18		06:17	17:15 (3)	06:04		05:02		04:26	
	15:58	10 15:23 (5)	16:54		17:47	6 17:21 (3)	19:42		20:35		21:15	
12	08:00	15:13 (5)	07:16		06:15	17:13 (3)	06:02		05:00		04:26	
	15:59	12 15:25 (5)	16:56		17:48	9 17:22 (3)	19:44		20:36		21:16	
13	07:59	15:13 (5)	07:14	16:26 (4)	06:13	17:13 (3)	05:59		04:58		04:26	
	16:01	13 15:26 (5)	16:58	3 16:29 (4)	17:50	11 17:24 (3)	19:46		20:38		21:17	
14	07:58	15:13 (5)	07:12	16:24 (4)	06:10	17:12 (3)	05:57	19:20 (1)	04:56		04:25	
	16:02	15 15:28 (5)	16:59	7 16:31 (4)	17:52	14 17:26 (3)	19:48	2 19:22 (1)	20:40		21:17	
15	07:58	15:14 (5)	07:10	16:23 (4)	06:08	17:11 (3)	05:55	19:19 (1)	04:55		04:25	
	16:04	16 15:30 (5)	17:01	10 16:33 (4)	17:54	17 17:28 (3)	19:49	3 19:22 (1)	20:41		21:18	
16	07:57	15:14 (5)	07:08	16:22 (4)	06:06	17:11 (3)	05:53	19:19 (1)	04:53		04:25	
	16:05	18 15:32 (5)	17:03	13 16:35 (4)	17:56	19 17:30 (3)	19:51	5 19:24 (1)	20:43		21:19	
17	07:56	15:13 (5)	07:06	16:21 (4)	06:03	17:10 (3)	05:50	19:20 (1)	04:52		04:25	
	16:07	20 15:33 (5)	17:05	16 16:37 (4)	17:58	21 17:31 (3)	19:53	5 19:25 (1)	20:45		21:19	
18	07:55	15:14 (5)	07:04	16:21 (4)	06:01	17:11 (3)	05:48	19:20 (1)	04:50		04:25	
	16:09	21 15:35 (5)	17:07	18 16:39 (4)	17:59	20 17:31 (3)	19:55	7 19:27 (1)	20:46		21:19	
19	07:54	15:14 (5)	07:02	16:21 (4)	05:59	17:12 (3)	05:46	19:22 (1)	04:49		04:25	
	16:11	23 15:37 (5)	17:09	20 16:41 (4)	18:01	19 17:31 (3)	19:56	7 19:29 (1)	20:48		21:20	
20	07:52	15:15 (5)	07:00	16:21 (4)	05:56	17:12 (3)	05:44		04:47		04:25	
	16:12	23 15:38 (5)	17:11	23 16:44 (4)	18:03	17 17:29 (3)	19:58		20:49		21:20	
21	07:51	15:15 (5)	06:58	16:21 (4)	05:54	17:14 (3)	05:41		04:46		04:25	
	16:14	22 15:37 (5)	17:13	23 16:44 (4)	18:05	13 17:27 (3)	20:00		20:51		21:20	
22	07:50	15:15 (5)	06:56	16:20 (4)	05:51	17:15 (3)	05:39		04:44		04:25	
	16:16	23 15:38 (5)	17:15	23 16:43 (4)	18:07	9 17:24 (3)	20:02		20:52		21:21	
23	07:49	15:15 (5)	06:54	16:21 (4)	05:49		05:37		04:43		04:26	
	16:18	22 15:37 (5)	17:17	21 16:42 (4)	18:08		20:04		20:54		21:21	
24	07:48	15:17 (5)	06:51	16:22 (4)	05:47		05:35		04:42		04:26	
	16:19	21 15:38 (5)	17:19	19 16:41 (4)	18:10		20:05		20:55		21:21	
25	07:46	15:17 (5)	06:49	16:24 (4)	05:44		05:33		04:40		04:26	
	16:21	20 15:37 (5)	17:21	16 16:40 (4)	18:12		20:07		20:56		21:21	
26	07:45	15:19 (5)	06:47	16:25 (4)	05:42		05:31		04:39		04:27	
	16:23	18 15:37 (5)	17:22	13 16:38 (4)	18:14		20:09		20:58		21:21	
27	07:44	15:19 (5)	06:45	16:28 (4)	05:39		05:29		04:38		04:27	
	16:25	17 15:36 (5)	17:24	7 16:35 (4)	18:15		20:11		20:59		21:21	
28	07:42	15:21 (5)	06:43		05:37		05:27		04:37		04:28	
	16:27	14 15:35 (5)	17:26		18:17		20:12		21:01		21:21	
29	07:41	15:23 (5)			06:35		05:24		04:36		04:28	
	16:29	11 15:34 (5)			19:19		20:14		21:02		21:21	
30	07:39	15:27 (5)			06:32	18:53 (2)	05:22		04:35		04:29	
	16:31	3 15:30 (5)			19:21	2 18:55 (2)	20:16		21:03		21:20	
31	07:37				06:30	18:53 (2)			04:34			
	16:32				19:23	4 18:57 (2)			21:04			
Potential sun hours	254		275		367		418		490		505	
Total, worst case		366		232		183		60				

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)

Project:

Pawlowo_Golancz_miasto_07102010

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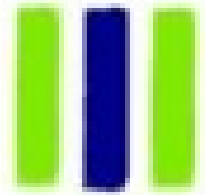
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** V - Shadow Receptor: 1.5 × 1.5 Azimuth: 65.5° Slope: 90.0° (29)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	July	August	September	October	November	December
1	04:29 21:20	05:08 20:46	06:00 19:42	06:51 18:30	17:53 (3) 18:03 (3)	06:47 16:22
2	04:30 21:20	05:09 20:45	06:01 19:40	06:53 18:28	17:53 (3) 18:00 (3)	06:49 16:20
3	04:31 21:19	05:11 20:43	06:03 19:37	06:54 18:26	17:54 (3) 17:57 (3)	06:51 16:18
4	04:32 21:19	05:12 20:41	06:05 19:35	06:56 18:23	06:53 16:16	06:53 15:38
5	04:32 21:18	05:14 20:39	06:06 19:33	06:58 18:21	06:54 16:14	06:54 15:37
6	04:33 21:18	05:16 20:38	06:08 19:30	07:00 18:19	06:56 16:13	06:56 15:37
7	04:34 21:17	05:17 20:36	06:10 19:28	07:01 18:16	06:58 16:11	06:58 15:36
8	04:35 21:16	05:19 20:34	06:12 19:26	18:49 (2) 18:57 (2)	07:03 16:09	07:00 15:36
9	04:36 21:16	05:21 20:32	06:13 19:23	18:48 (2) 18:56 (2)	07:05 16:07	07:02 15:35
10	04:37 21:15	05:22 20:30	06:15 19:21	18:46 (2) 18:53 (2)	07:07 16:06	07:04 15:35
11	04:38 21:14	05:24 20:28	06:17 19:19	18:45 (2) 18:51 (2)	07:08 16:04	07:06 15:35
12	04:39 21:13	05:26 20:26	06:18 19:16	18:44 (2) 18:48 (2)	07:10 16:02	14:58 (5) 15:02 (5)
13	04:41 21:12	05:27 20:24	06:20 19:14	18:44 (2) 18:46 (2)	07:12 16:01	14:55 (5) 15:06 (5)
14	04:42 21:11	05:29 20:22	06:22 19:11	07:14 18:00	07:11 15:59	14:53 (5) 15:07 (5)
15	04:43 21:10	05:31 20:20	06:23 19:09	07:16 17:58	16:58 (4) 17:09 (4)	07:13 15:58
16	04:44 21:09	05:32 20:18	06:25 19:07	07:17 17:56	16:56 (4) 17:11 (4)	07:15 15:56
17	04:46 21:08	05:34 20:16	06:27 19:04	07:19 17:53	16:54 (4) 17:12 (4)	07:17 15:55
18	04:47 21:07	05:36 20:13	06:29 19:02	07:21 17:51	16:53 (4) 17:13 (4)	07:18 15:54
19	04:48 21:06	05:38 20:11	06:30 18:59	07:23 17:49	16:52 (4) 17:14 (4)	07:20 15:52
20	04:50 21:05	05:39 20:09	06:32 18:57	07:25 17:47	16:52 (4) 17:14 (4)	07:22 15:51
21	04:51 21:03	05:41 20:07	06:34 18:54	18:02 (3) 18:08 (3)	07:24 17:14 (4)	15:51 15:50
22	04:52 21:02	05:43 20:05	06:35 18:52	17:59 (3) 18:11 (3)	07:25 17:13 (4)	15:51 15:48
23	04:54 21:01	05:44 20:03	06:37 18:50	17:57 (3) 18:13 (3)	07:27 17:11 (4)	15:51 15:47
24	04:55 20:59	05:46 20:00	06:39 18:47	17:56 (3) 18:14 (3)	07:29 17:09 (4)	15:51 15:46
25	04:57 20:58	05:48 19:58	06:40 19:30 (1)	17:54 (3) 18:14 (3)	07:30 16:07 (4)	15:51 15:45
26	04:58 20:56	05:49 19:56	06:42 19:22 (1)	17:53 (3) 18:14 (3)	07:32 16:05 (4)	15:52 15:44
27	05:00 20:55	05:51 19:54	06:44 19:21 (1)	17:53 (3) 18:12 (3)	07:34 16:02 (4)	15:53 15:43
28	05:01 20:53	05:53 19:51	06:46 19:21 (1)	17:52 (3) 18:09 (3)	07:35 16:00 (4)	15:54 15:42
29	05:03 20:51	05:55 19:49	06:47 18:35	17:52 (3) 18:07 (3)	07:37 15:58 (4)	15:56 15:41
30	05:04 20:50	05:56 19:47	06:49 18:33	17:52 (3) 18:05 (3)	07:38 16:26	15:56 15:40
31	05:06 20:48	05:58 19:44	06:45 18:33	16:24 16:24	15:40 15:40	15:42 15:43
Potential sun hours	507	457	382	330	263	238
Total, worst case		27	192	256	334	34

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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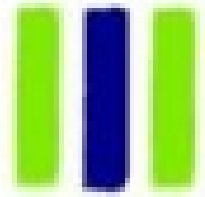
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252



SHADOW - Calendar

Calculation: Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal

Shadow receptor: W - Shadow Receptor: 1.5 × 1.5 Azimuth: -27.8° Slope: 90.0° (24)

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:05	08:37 (2) 07:36	08:14 (1) 06:41	06:28	05:21	04:33	04:29	05:08	06:00	06:51	06:47	07:40
	15:45	4 08:41 (2) 16:34	13 08:27 (1) 17:28	19:25	20:18	21:06	21:20	20:47	19:42	18:31	16:22	15:40
2	08:05	08:37 (2) 07:34	08:16 (1) 06:38	06:25	05:19	04:32	04:30	05:09	06:01	06:53	06:49	07:42
	15:46	5 08:42 (2) 16:36	9 08:25 (1) 17:30	19:26	20:20	21:07	21:20	20:45	19:40	18:28	16:20	15:39
3	08:04	08:37 (2) 07:33	08:18 (1) 06:36	06:23	05:17	04:31	04:31	05:11	06:03	06:54	06:51	07:43
	15:47	6 08:43 (2) 16:38	5 08:23 (1) 17:32	19:28	20:21	21:08	21:19	20:43	19:38	18:26	16:18	15:38
4	08:04	08:36 (2) 07:31		06:34	06:21	05:15	04:31	04:32	05:13	06:05	06:56	06:53
	15:48	7 08:43 (2) 16:40		17:34	19:30	20:23	21:09	21:19	20:41	19:35	18:23	16:16
5	08:04	08:36 (2) 07:29		06:31	06:18	05:13	04:30	04:33	05:14	06:07	06:58	06:55
	15:49	8 08:44 (2) 16:42		17:36	19:32	20:25	21:10	21:19	20:40	19:33	18:21	16:15
6	08:03	08:35 (2) 07:28		06:29	06:16	05:11	04:29	04:33	05:16	06:08	07:00	06:56
	15:51	9 08:44 (2) 16:44		17:38	19:33	20:26	21:11	21:18	20:38	19:31	18:19	16:13
7	08:03	08:35 (2) 07:26		06:27	06:13	05:09	04:28	04:34	05:17	06:10	07:02	06:58
	15:52	10 08:45 (2) 16:46		17:39	19:35	20:28	21:12	21:17	20:36	19:28	18:16	16:11
8	08:03	08:34 (2) 07:24		06:25	06:11	05:07	04:28	04:35	05:19	06:12	07:03	07:00
	15:53	11 08:45 (2) 16:48		17:41	19:37	20:30	21:13	21:17	20:34	19:26	18:14	16:09
9	08:02	08:33 (2) 07:22		06:22	06:09	05:05	04:27	04:36	05:21	06:13	07:05	07:02
	15:55	12 08:45 (2) 16:50		17:43	19:39	20:32	21:14	21:16	20:32	19:23	18:12	16:08
10	08:01	08:33 (2) 07:20		06:20	06:06	05:03	04:27	04:37	05:22	06:15	07:07	07:04
	15:56	13 08:46 (2) 16:52		17:45	19:41	20:33	21:15	21:15	20:30	19:21	18:09	16:06
11	08:01	08:32 (2) 07:18		06:18	06:04	05:02	04:26	04:38	05:24	06:17	07:09	07:06
	15:58	14 08:46 (2) 16:54		17:47	19:42	20:35	21:16	21:14	20:28	19:19	18:07	16:04
12	08:00	08:32 (2) 07:16		06:15	06:02	05:00	04:26	04:40	05:26	06:18	07:10	07:08
	15:59	14 08:46 (2) 16:56		17:49	19:44	20:37	21:16	21:13	20:26	19:16	18:05	16:03
13	07:59	08:33 (2) 07:14		06:13	06:00	04:58	04:26	04:41	05:27	06:20	07:12	07:09
	16:01	13 08:46 (2) 16:58		17:50	19:46	20:38	21:17	21:13	20:24	19:14	18:03	16:01
14	07:59	08:33 (2) 07:13		06:11	05:57	04:57	04:26	04:42	05:29	06:22	07:14	07:11
	16:02	13 08:46 (2) 17:00		17:52	19:48	20:40	21:18	21:12	20:22	19:11	18:00	16:00
15	07:58	08:34 (2) 07:11		06:08	05:55	04:55	04:25	04:43	05:31	06:24	07:16	07:13
	16:04	12 08:46 (2) 17:01		17:54	19:49	20:42	21:18	21:11	20:20	19:09	17:58	16:00
16	07:57	08:36 (2) 07:09		06:06	05:53	04:53	04:25	04:44	05:33	06:25	07:18	07:15
	16:06	10 08:46 (2) 17:03		17:56	19:51	20:43	21:19	21:09	20:18	19:07	17:56	16:00
17	07:56	08:37 (2) 07:06		06:03	05:50	04:52	04:25	04:46	05:34	06:27	07:19	07:17
	16:07	8 08:45 (2) 17:05		17:58	19:53	20:45	21:19	21:08	20:16	19:04	17:54	16:00
18	07:55	08:39 (2) 07:04		06:01	05:48	04:50	04:25	04:47	05:36	06:29	07:21	07:19
	16:09	4 08:43 (2) 17:07		17:59	19:55	20:46	21:20	21:07	20:14	19:02	17:51	16:00
19	07:54	07:02		05:59	05:46	04:49	04:25	04:48	05:38	06:30	07:23	07:20
	16:11	17:09		18:01	19:57	20:48	21:20	21:06	20:11	18:59	17:49	16:00
20	07:53	08:22 (1) 07:00		05:56	05:44	04:47	04:25	04:50	05:39	06:32	07:25	07:22
	16:12	2 08:24 (1) 17:11		18:03	19:58	20:49	21:20	21:05	20:09	18:57	17:47	16:00
21	07:52	08:20 (1) 06:58		05:54	05:42	04:46	04:25	04:51	05:41	06:34	07:27	07:24
	16:14	4 08:24 (1) 17:13		18:05	20:00	20:51	21:21	21:03	20:07	18:55	17:45	16:00
22	07:50	08:19 (1) 06:56		05:51	05:39	04:44	04:25	04:52	05:43	06:35	07:29	07:26
	16:16	6 08:25 (1) 17:15		18:07	20:02	20:52	21:21	21:02	20:05	18:52	17:43	16:00
23	07:49	08:18 (1) 06:54		05:49	05:37	04:43	04:26	04:54	05:44	06:37	07:30	07:27
	16:18	9 08:27 (1) 17:17		18:08	20:04	20:54	21:21	21:01	20:03	18:50	17:40	16:00
24	07:48	08:16 (1) 06:52		05:47	05:35	04:42	04:26	04:55	05:46	06:39	07:32	07:29
	16:19	11 08:27 (1) 17:19		18:10	20:05	20:55	21:21	20:59	20:01	18:47	17:38	16:00
25	07:46	08:15 (1) 06:49		05:44	05:33	04:41	04:26	04:57	05:48	06:41	07:34	07:31
	16:21	13 08:28 (1) 17:21		18:12	20:07	20:57	21:21	20:58	19:58	18:45	17:36	16:00
26	07:45	08:13 (1) 06:47		05:42	05:31	04:39	04:27	04:58	05:50	06:42	07:36	07:32
	16:23	15 08:28 (1) 17:23		18:14	20:09	20:58	21:21	20:56	19:56	18:43	17:34	16:00
27	07:44	08:12 (1) 06:45		05:40	05:29	04:38	04:27	05:00	05:51	06:44	07:38	07:34
	16:25	17 08:29 (1) 17:24		18:16	20:11	20:59	21:21	20:55	19:54	18:40	17:32	16:00
28	07:42	08:11 (1) 06:43		05:37	05:27	04:37	04:28	05:01	05:53	06:46	07:40	07:36
	16:27	18 08:29 (1) 17:26		18:17	20:13	21:01	21:21	20:53	19:52	18:38	17:30	16:00
29	07:41	08:12 (1)		05:35	05:25	04:36	04:28	05:03	05:55	06:48	07:42	07:37
	16:29	16 08:28 (1)		18:19	20:14	21:02	21:21	20:52	19:49	18:35	17:28	16:00
30	07:39	08:13 (1)		05:32	05:23	04:35	04:29	05:05	05:56	06:49	07:44	07:39
	16:31	16 08:29 (1)		18:21	20:16	21:03	21:21	20:50	19:47	18:33	17:26	16:00
31	07:38	08:13 (1)		05:30		04:34		05:06	05:58		06:45	
	16:33	15 08:28 (1)		18:23		21:05		20:48	19:45		16:24	
Potential sun hours	254	275	367	418	490	505	507	457	382	330	262	245
Total, worst case	315	27	367	418	490	505	507	457	382	330	262	117

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

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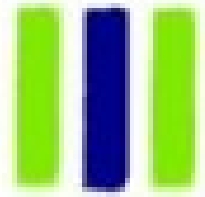
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** X - Shadow Receptor: 1.5 × 1.5 Azimuth: -27.8° Slope: 90.0° (S5)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December				
1	08:05 15:45	08:40 (2) 08:54 (2)	07:36 16:34	06:41 17:28	06:28 19:25	05:21 20:18	04:33 21:06	04:29 21:20	05:08 20:47	06:00 19:42	06:51 18:31	06:47 16:22	07:40 15:40	08:14 (1) 08:17 (1)		
2	08:05 15:46	08:41 (2) 08:55 (2)	07:34 16:36	06:38 17:30	06:25 19:26	05:19 20:20	04:32 21:07	04:30 21:20	05:09 20:45	06:01 19:40	06:53 18:28	06:49 16:20	07:42 15:39	08:15 (1) 08:36 (2)		
3	08:04 15:47	08:42 (2) 08:56 (2)	07:33 16:38	06:36 17:32	06:23 19:28	05:17 20:21	04:31 21:08	04:31 21:19	05:11 20:43	06:03 19:38	06:54 18:26	06:51 16:18	07:43 15:38	08:31 (2) 08:38 (2)		
4	08:04 15:48	08:42 (2) 08:55 (2)	07:31 16:40	06:34 17:34	06:21 19:30	05:15 20:23	04:31 21:09	04:32 21:19	05:13 20:41	06:05 19:35	06:56 18:23	06:53 16:16	07:45 15:38	08:30 (2) 08:39 (2)		
5	08:04 15:49	08:43 (2) 08:56 (2)	07:29 16:42	06:31 17:36	06:18 19:32	05:13 20:25	04:30 21:10	04:33 21:19	05:14 20:40	06:07 19:33	06:58 18:21	06:55 16:15	07:46 15:37	08:30 (2) 08:41 (2)		
6	08:03 15:51	08:43 (2) 08:55 (2)	07:28 16:44	06:29 17:38	06:16 19:33	05:11 20:26	04:29 21:11	04:33 21:18	05:16 20:38	06:08 19:31	07:00 18:19	06:56 16:13	07:47 15:37	08:29 (2) 08:41 (2)		
7	08:03 15:52	08:45 (2) 08:56 (2)	07:26 16:46	06:27 17:39	06:13 19:35	05:09 20:28	04:28 21:12	04:34 21:17	05:17 20:36	06:10 19:28	07:02 18:16	06:58 16:11	07:49 15:36	08:30 (2) 08:43 (2)		
8	08:03 15:53	08:45 (2) 08:55 (2)	07:24 16:48	06:25 17:41	06:11 19:37	05:07 20:30	04:28 21:13	04:35 21:17	05:19 20:34	06:12 19:26	07:03 18:14	07:00 16:09	07:50 15:36	08:30 (2) 08:43 (2)		
9	08:02 15:55	08:46 (2) 08:54 (2)	07:22 16:50	06:22 17:43	06:09 19:39	05:05 20:32	04:27 21:14	04:36 21:16	05:21 20:32	06:13 19:23	07:05 18:12	07:02 16:08	07:51 15:35	08:30 (2) 08:44 (2)		
10	08:01 15:56	08:33 (1) 08:54 (2)	07:20 16:52	06:20 17:45	06:06 19:41	05:03 20:33	04:27 21:15	04:37 21:15	05:22 20:30	06:15 19:21	07:07 18:09	07:04 16:06	07:52 15:35	08:30 (2) 08:44 (2)		
11	08:01 15:58	08:32 (1) 08:35 (1)	07:18 16:54	06:18 17:47	06:04 19:42	05:02 20:35	04:26 21:16	04:38 21:14	05:24 20:28	06:17 19:19	07:09 18:07	07:06 16:04	07:53 15:35	08:31 (2) 08:45 (2)		
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13	07:59 16:01	08:30 (1) 08:37 (1)	07:14 16:58	06:13 17:50	06:00 19:46	04:58 20:38	04:26 21:17	04:41 21:13	05:27 20:24	06:20 19:14	07:12 18:03	07:09 16:01	07:55 15:35	08:31 (2) 08:46 (2)		
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15	07:58 16:04	08:28 (1) 08:38 (1)	07:11 17:01	06:08 17:54	05:55 19:49	04:55 20:42	04:25 21:18	04:43 21:11	05:31 20:20	06:24 19:09	07:16 17:58	07:13 15:58	7 10	08:09 (1) 08:11 (1)	07:57 15:35	08:32 (2) 08:47 (2)
16	07:57 16:06	08:27 (1) 08:39 (1)	07:09 17:03	06:06 17:56	05:53 19:51	04:53 20:43	04:25 21:19	04:44 21:09	05:33 20:18	06:25 19:07	07:18 17:56	07:15 15:56	10 13	08:00 (1) 08:13 (1)	07:58 15:35	08:33 (2) 08:48 (2)
17	07:56 16:07	08:26 (1) 08:40 (1)	07:06 17:05	06:03 17:58	05:50 19:53	04:52 20:45	04:25 21:19	04:46 21:08	05:34 20:16	06:27 19:04	07:19 17:54	07:17 15:55	13 15	07:59 (1) 08:14 (1)	07:59 15:35	08:33 (2) 08:48 (2)
18	07:55 16:09	08:24 (1) 08:40 (1)	07:04 17:07	06:01 17:59	05:48 19:55	04:50 20:46	04:25 21:20	04:47 21:07	05:36 20:14	06:29 19:02	07:21 17:51	07:19 15:54	15 16	07:59 (1) 08:15 (1)	08:00 15:35	08:34 (2) 08:49 (2)
19	07:54 16:11	08:23 (1) 08:40 (1)	07:02 17:09	05:59 18:01	05:46 19:57	04:49 20:48	04:25 21:20	04:48 21:06	05:38 20:11	06:30 18:59	07:23 17:49	07:20 15:52	16 18	07:58 (1) 08:16 (1)	08:01 15:36	08:35 (2) 08:49 (2)
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22	07:50 16:16	08:23 (1) 08:41 (1)	06:56 17:15	05:51 18:07	05:39 20:02	04:44 20:52	04:25 21:21	04:52 21:02	05:43 20:05	06:35 18:52	07:29 17:43	07:26 15:48	18 18	07:59 (1) 08:17 (1)	08:02 15:37	08:36 (2) 08:50 (2)
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26	07:45 16:23	08:26 (1) 08:29 (1)	06:47 17:23	05:42 18:14	05:31 20:09	04:39 20:58	04:27 21:21	04:58 20:56	05:50 19:56	06:42 18:43	07:35 17:34	07:32 15:44	12 12	08:04 (1) 08:17 (1)	08:04 15:39	08:38 (2) 08:53 (2)
27	07:44 16:25	08:29 (1) 08:39 (1)	06:45 17:24	05:40 18:16	05:29 20:11	04:38 20:59	04:27 21:21	05:00 20:55	05:51 19:54	06:44 18:40	07:36 17:32	07:34 15:43	11 11	08:07 (1) 08:18 (1)	08:04 15:40	08:38 (2) 08:53 (2)
28	07:42 16:27	08:31 (1) 08:37 (1)	06:43 17:26	05:37 18:17	05:27 20:13	04:37 21:01	04:28 21:21	05:01 20:53	05:53 19:51	06:46 18:38	07:39 17:30	07:36 15:42	9 9	08:09 (1) 08:18 (1)	08:04 15:41	08:38 (2) 08:53 (2)
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31	07:38 16:33			06:30 19:23		04:34 21:05		05:06 20:48	05:58 19:45		06:45 16:24				08:05 15:44	08:40 (2) 08:55 (2)
Potential sun hours	254		275	367	418	490	505	507	457	382	330	262			225	411
Total, worst case		341														

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Pawlowo_Golancz_miasto_07102010

Printed/Page

10/08/2010 5:41 PM / 31

Licensed user:

EMPEKO

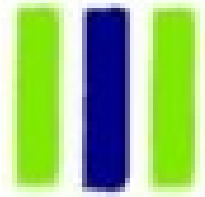
Os. Bolesława Chrobrego 24/45

PL-60 681 Poznan

+4861 670 74 08

Calculated:

10/08/2010 5:29 PM/2.6.1.252

**SHADOW - Calendar****Calculation:** Miasto Golancz - Shadow Flickering - 08.10.2010 - Normal**Shadow receptor:** Y - Shadow Receptor: 1.5 × 1.5 Azimuth: -28.5° Slope: 90.0° (66)**Assumptions for shadow calculations**

Maximum distance for influence 2,000 m
 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

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:05 15:45	08:37 (1) 08:54 (1)	07:36 16:34	06:41 17:28	06:28 19:25	05:21 20:18	04:33 21:06	04:29 21:20	05:08 20:47	06:00 19:42	06:51 18:31	06:47 16:22	07:40 15:40	08:15 (3) 08:41 (1)
2	08:05 15:46	08:37 (1) 08:55 (1)	07:34 16:36	06:38 17:30	06:25 19:26	05:19 20:20	04:32 21:07	04:30 21:20	05:09 20:45	06:01 19:40	06:53 18:28	06:49 16:20	07:42 15:39	08:15 (3) 08:41 (1)
3	08:04 15:47	08:37 (3) 08:56 (1)	07:33 16:38	06:36 17:32	06:23 19:28	05:17 20:21	04:31 21:08	04:31 21:19	05:11 20:43	06:03 19:38	06:54 18:26	06:51 16:18	07:43 15:38	08:17 (3) 08:42 (1)
4	08:04 15:48	08:36 (3) 08:56 (1)	07:31 16:40	06:34 17:34	06:21 19:30	05:15 20:23	04:31 21:09	04:32 21:19	05:13 20:41	06:05 19:35	06:56 18:23	06:53 16:16	07:45 15:38	08:18 (3) 08:42 (1)
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6	08:03 15:51	08:35 (3) 08:57 (1)	07:28 16:44	06:29 17:38	06:16 19:33	05:11 20:26	04:29 21:11	04:33 21:18	05:16 20:38	06:08 19:31	07:00 18:19	06:56 16:13	07:47 15:37	08:21 (3) 08:43 (1)
7	08:03 15:52	08:35 (3) 08:58 (1)	07:26 16:46	06:27 17:39	06:13 19:35	05:09 20:28	04:28 21:12	04:34 21:17	05:17 20:36	06:10 19:28	07:02 18:16	06:58 16:11	07:49 15:36	08:23 (3) 08:44 (1)
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31	07:38 16:32			06:30 19:23		04:34 21:05		05:06 20:48	05:58 19:45		06:45 16:24		08:05 15:43	08:38 (1) 08:54 (1)
Potential sun hours	254		275	367	418	490	505	507	457	382	330	262		238
Total, worst case		336										96		528

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		