



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_01 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -96.5° Slope: 90.0° (32)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2.61 3.03 3.64 5.32 6.89 7.61 8.86 9.04 7.43 5.21 3.54 2.37

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
1,100 811 599 537 466 626 951 657 457 913 862 781 8,760

	January	February	March	April	May	June
1	07:44 16:42	07:28 17:19	06:48 17:57	07:52 (LZ06) 08:40 (LZ06)	06:53 19:35	07:17 (LZ02) 20:11
2	07:44 16:43	07:27 17:20	06:46 17:58	07:51 (LZ06) 08:40 (LZ06)	06:51 19:36	07:15 (LZ02) 20:12
3	07:44 16:44	07:25 17:22	06:45 17:59	07:50 (LZ06) 08:40 (LZ06)	06:49 19:38	07:15 (LZ02) 20:14
4	07:44 16:45	07:24 17:23	06:43 18:01	07:50 (LZ06) 08:41 (LZ06)	06:48 19:39	07:14 (LZ02) 20:15
5	07:44 16:46	07:23 17:24	06:41 18:02	07:50 (LZ06) 08:41 (LZ06)	06:46 19:40	07:13 (LZ02) 20:16
6	07:44 16:47	07:22 17:26	06:40 18:03	07:49 (LZ06) 08:40 (LZ06)	06:44 19:41	07:13 (LZ02) 20:17
7	07:44 16:48	07:21 17:27	06:38 18:04	07:48 (LZ06) 08:40 (LZ06)	06:42 19:42	07:12 (LZ02) 20:18
8	07:43 16:49	07:19 17:29	06:36 18:06	07:49 (LZ06) 08:40 (LZ06)	06:40 19:44	07:13 (LZ02) 20:19
9	07:43 16:50	07:18 17:30	06:34 18:07	07:49 (LZ06) 08:39 (LZ06)	06:39 19:45	07:14 (LZ02) 20:20
10	07:43 16:51	07:17 17:31	06:33 18:08	07:48 (LZ06) 08:38 (LZ06)	06:37 19:46	07:14 (LZ02) 20:22
11	07:43 16:52	07:15 17:33	06:31 18:10	07:48 (LZ06) 08:38 (LZ06)	06:35 19:47	07:15 (LZ02) 20:23
12	07:42 16:53	07:14 17:34	06:29 18:11	07:48 (LZ06) 08:36 (LZ06)	06:33 19:48	07:19 (LZ02) 20:24
13	07:42 16:54	07:13 17:35	06:27 18:12	07:49 (LZ06) 08:36 (LZ06)	06:32 19:50	05:47 20:25
14	07:42 16:56	07:11 17:37	06:25 18:13	07:49 (LZ06) 08:35 (LZ06)	06:30 19:51	05:46 20:26
15	07:41 16:57	07:10 17:38	06:24 18:15	07:50 (LZ06) 08:33 (LZ06)	06:28 19:52	05:45 20:27
16	07:41 16:58	07:08 17:40	06:22 18:16	07:50 (LZ06) 08:32 (LZ06)	06:27 19:53	05:44 20:28
17	07:40 16:59	07:07 17:41	06:20 18:17	07:51 (LZ06) 08:30 (LZ06)	06:25 19:54	05:43 20:29
18	07:39 17:00	07:05 17:42	08:17 (LZ06) 08:18 (LZ06)	07:53 (LZ06) 08:29 (LZ06)	06:23 19:56	05:42 20:31
19	07:39 17:02	07:04 17:44	08:09 (LZ06) 08:26 (LZ06)	07:54 (LZ06) 08:27 (LZ06)	06:22 19:57	05:41 20:32
20	07:38 17:03	07:02 17:45	08:06 (LZ06) 08:30 (LZ06)	07:55 (LZ06) 08:24 (LZ06)	06:20 19:58	05:40 20:33
21	07:38 17:04	07:01 17:46	08:03 (LZ06) 08:32 (LZ06)	07:57 (LZ06) 08:21 (LZ06)	06:18 19:59	05:39 20:34
22	07:37 17:06	06:59 17:48	08:00 (LZ06) 08:33 (LZ06)	07:59 (LZ06) 08:17 (LZ06)	06:17 20:00	05:38 20:35
23	07:36 17:07	06:58 17:49	07:59 (LZ06) 08:35 (LZ06)	08:05 (LZ06) 08:10 (LZ06)	06:15 20:02	05:37 20:36
24	07:35 17:08	06:56 17:50	07:57 (LZ06) 08:36 (LZ06)	06:07 18:26	06:14 20:03	05:36 20:37
25	07:34 17:09	06:55 17:52	07:56 (LZ06) 08:38 (LZ06)	06:06 18:27	06:12 20:04	05:36 20:38
26	07:34 17:11	06:53 17:53	07:55 (LZ06) 08:38 (LZ06)	06:04 18:28	06:10 20:05	05:35 20:39
27	07:33 17:12	06:51 17:54	07:54 (LZ06) 08:39 (LZ06)	06:02 18:29	06:09 20:06	05:34 20:40
28	07:32 17:13	06:50 17:55	07:52 (LZ06) 08:39 (LZ06)	06:00 18:30	06:07 20:08	05:33 20:40
29	07:31 17:15		06:58 19:32	06:06 20:09	06:06 20:41	05:33 20:56
30	07:30 17:16		06:57 19:33	07:21 (LZ02) 07:30 (LZ02)	06:04 20:10	05:32 20:42
31	07:29 17:18		06:55 19:34	07:19 (LZ02) 07:32 (LZ02)	06:04 20:10	05:31 20:43
Potential sun hours	289	293	369	402	456	462
Total, worst case		356	985	209		
Sun reduction		0.29	0.31	0.40		
Oper. time red.		1.00	1.00	1.00		
Wind dir. red.		0.64	0.64	0.60		
Total reduction		0.19	0.20	0.24		
Total, real		66	194	50		

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_01 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -96.5° Slope: 90.0° (32)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:56	05:57 20:34	06:32 19:47	07:15 (LZ02) 18:52	07:06 18:52	08:28 (LZ06) 17:01
2	05:31 20:55	05:58 20:33	06:33 19:45	07:13 (LZ02) 18:50	07:07 18:50	08:27 (LZ06) 17:00
3	05:32 20:55	05:59 20:32	06:34 19:43	07:12 (LZ02) 18:49	07:08 18:49	08:26 (LZ06) 16:59
4	05:32 20:55	06:00 20:30	06:35 19:42	07:10 (LZ02) 18:47	07:09 18:47	08:26 (LZ06) 16:57
5	05:33 20:55	06:01 20:29	06:36 19:40	07:10 (LZ02) 18:45	07:11 18:45	08:26 (LZ06) 16:50
6	05:33 20:54	06:02 20:28	06:37 19:38	07:09 (LZ02) 18:43	07:12 18:43	08:25 (LZ06) 16:51
7	05:34 20:54	06:03 20:26	06:38 19:36	07:08 (LZ02) 18:42	07:13 18:42	08:25 (LZ06) 16:54
8	05:35 20:54	06:05 20:25	06:40 19:34	07:08 (LZ02) 18:40	07:14 18:40	08:24 (LZ06) 16:52
9	05:35 20:53	06:06 20:24	06:41 19:33	07:08 (LZ02) 18:38	07:15 18:38	08:25 (LZ06) 16:51
10	05:36 20:53	06:07 20:22	06:42 19:31	07:08 (LZ02) 18:36	07:17 18:36	08:25 (LZ06) 16:50
11	05:37 20:52	06:08 20:21	06:43 19:29	07:09 (LZ02) 18:35	07:18 18:35	08:25 (LZ06) 16:49
12	05:38 20:52	06:09 20:19	06:44 19:27	07:11 (LZ02) 18:33	07:19 18:33	08:25 (LZ06) 16:48
13	05:39 20:51	06:10 20:18	06:45 19:25	07:12 (LZ02) 18:31	07:20 18:31	08:26 (LZ06) 16:47
14	05:39 20:51	06:11 20:16	06:46 19:24	07:22 (LZ02) 18:29	07:21 18:29	08:26 (LZ06) 16:46
15	05:40 20:50	06:12 20:15	06:47 19:22	07:23 18:28	07:23 18:28	08:26 (LZ06) 16:45
16	05:41 20:49	06:14 20:13	06:49 19:20	07:24 18:26	07:24 18:26	08:27 (LZ06) 16:44
17	05:42 20:49	06:15 20:12	06:50 19:18	07:25 18:24	07:25 18:24	08:28 (LZ06) 16:43
18	05:43 20:48	06:16 20:10	06:51 19:16	07:26 18:23	07:26 18:23	08:29 (LZ06) 16:42
19	05:44 20:47	06:17 20:09	06:52 19:14	07:28 18:21	07:28 18:21	08:30 (LZ06) 16:41
20	05:45 20:46	06:18 20:07	06:53 19:12	07:29 18:19	07:29 18:19	08:32 (LZ06) 16:40
21	05:46 20:45	06:19 20:06	06:54 19:11	08:46 (LZ06) 18:18	07:30 18:18	08:34 (LZ06) 16:39
22	05:47 20:45	06:20 20:04	06:55 19:09	08:43 (LZ06) 18:16	07:31 18:16	08:36 (LZ06) 16:39
23	05:48 20:44	06:21 20:02	06:57 19:07	08:40 (LZ06) 18:15	07:33 18:15	08:58 (LZ06) 16:38
24	05:49 20:43	06:23 20:01	06:58 19:05	08:38 (LZ06) 18:13	07:34 18:13	08:55 (LZ06) 16:37
25	05:50 20:42	06:24 19:59	06:59 19:03	08:36 (LZ06) 18:12	06:35 17:12	16:37
26	05:51 20:41	06:25 19:57	07:00 19:01	08:34 (LZ06) 18:10	06:36 17:10	16:37
27	05:52 20:40	06:26 19:56	07:01 19:00	08:32 (LZ06) 18:09	06:38 17:09	16:36
28	05:53 20:39	06:27 19:54	07:02 18:58	08:31 (LZ06) 18:07	06:39 17:07	16:35
29	05:54 20:38	06:28 19:52	07:03 18:56	08:30 (LZ06) 18:06	06:40 17:06	16:35
30	05:55 20:36	06:29 19:50	07:05 18:54	08:29 (LZ06) 18:04	06:42 17:04	16:34
31	05:56 20:35	06:31 19:49	07:19 (LZ02) 07:25 (LZ02)	17:03	06:43	16:41
Potential sun hours	468	434	376	342	291	278
Total, worst case		6	576	991		
Sun reduction		0.65	0.59	0.47		
Oper. time red.		1.00	1.00	1.00		
Wind dir. red.		0.60	0.63	0.64		
Total reduction		0.39	0.37	0.30		
Total, real		2	214	301		

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		





SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_02 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -90.0° Slope: 90.0° (33)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March		April		May	June	July	August		September		October	November	December			
1	07:44	07:28	06:48		06:53		07:58 (LZ06)	06:03	05:31	05:31	05:57		06:32	07:51 (LZ06)	07:06	06:44	07:22		
	16:42	17:19	17:57		19:35	46	08:44 (LZ06)	20:11	20:44	20:56	20:34		19:47	52	08:43 (LZ06)	18:52	17:01	16:34	
2	07:44	07:27	06:46		06:51		07:57 (LZ06)	06:02	05:30	05:31	05:58		06:33	07:50 (LZ06)	07:07	06:46	07:24		
	16:43	17:20	17:58		19:36	47	08:44 (LZ06)	20:12	20:45	20:55	20:33		19:45	53	08:43 (LZ06)	18:50	17:00	16:33	
3	07:44	07:25	06:45		06:49		07:57 (LZ06)	06:00	05:30	05:32	05:59		06:34	07:50 (LZ06)	07:08	06:47	07:25		
	16:44	17:22	17:59		19:38	48	08:45 (LZ06)	20:13	20:46	20:55	20:32		19:43	52	08:42 (LZ06)	18:49	16:59	16:33	
4	07:44	07:24	06:43		06:48		07:55 (LZ06)	05:59	05:29	05:32	06:00		06:35	07:50 (LZ06)	07:09	06:48	07:26		
	16:45	17:23	18:01		19:39	50	08:45 (LZ06)	20:15	20:46	20:55	20:30		19:42	52	08:42 (LZ06)	18:47	16:57	16:33	
5	07:44	07:23	06:41		06:46		07:54 (LZ06)	05:57	05:29	05:33	06:01		06:36	07:50 (LZ06)	07:11	06:50	07:27		
	16:46	17:24	18:02		19:40	51	08:45 (LZ06)	20:16	20:47	20:55	20:29		19:40	51	08:41 (LZ06)	18:45	16:56	16:32	
6	07:44	07:22	06:40		06:44		07:53 (LZ06)	05:56	05:28	05:33	06:02		06:37	07:50 (LZ06)	07:12	06:51	07:28		
	16:47	17:26	18:03		19:41	52	08:45 (LZ06)	20:17	20:48	20:54	20:28		19:38	51	08:41 (LZ06)	18:43	16:55	16:32	
7	07:44	07:21	06:38		06:42		07:53 (LZ06)	05:55	05:28	05:34	06:03		06:38		07:49 (LZ06)	07:13	06:52	07:29	
	16:48	17:27	18:04		19:42	51	08:44 (LZ06)	20:18	20:49	20:54	20:26		19:36	51	08:40 (LZ06)	18:42	16:54	16:32	
8	07:43	07:19	06:36		06:40		07:53 (LZ06)	05:53	05:28	05:35	06:05		06:40		07:50 (LZ06)	07:14	06:53	07:30	
	16:49	17:29	18:06		19:44	52	08:45 (LZ06)	20:19	20:49	20:54	20:25		19:34	49	08:39 (LZ06)	18:40	16:52	16:32	
9	07:43	07:18	06:34		06:39		07:52 (LZ06)	05:52	05:28	05:36	06:06		06:41		07:50 (LZ06)	07:15	06:55	07:31	
	16:50	17:30	18:07		19:45	52	08:44 (LZ06)	20:20	20:50	20:53	20:24		19:33	48	08:38 (LZ06)	18:38	16:51	16:32	
10	07:43	07:17	06:33		06:37		07:51 (LZ06)	05:51	05:27	05:36	06:07		06:42		07:50 (LZ06)	07:17	06:56	07:32	
	16:51	17:31	18:08		19:46	53	08:44 (LZ06)	20:22	20:50	20:53	20:22		19:31	47	08:37 (LZ06)	18:36	16:50	16:32	
11	07:43	07:15	06:31		06:35		07:51 (LZ06)	05:50	05:27	05:37	06:08		06:43		07:50 (LZ06)	07:18	06:57	07:33	
	16:52	17:33	18:10		19:47	52	08:43 (LZ06)	20:23	20:51	20:52	20:21		19:29	46	08:36 (LZ06)	18:35	16:49	16:32	
12	07:42	07:14	06:29		06:33		07:51 (LZ06)	05:48	05:27	05:38	06:09		06:44		07:52 (LZ06)	07:19	06:59	07:33	
	16:53	17:34	18:11		19:48	52	08:43 (LZ06)	20:24	20:52	20:52	20:19		19:27	44	08:36 (LZ06)	18:33	16:48	16:32	
13	07:42	07:13	06:27		06:32		07:51 (LZ06)	05:47	05:27	05:39	06:10		06:45		07:53 (LZ06)	07:20	07:00	07:34	
	16:54	17:35	18:12		19:50	51	08:42 (LZ06)	20:25	20:52	20:51	20:18		19:25	41	08:34 (LZ06)	18:31	16:47	16:32	
14	07:42	07:11	06:25		06:30		07:51 (LZ06)	05:46	05:27	05:39	06:11		06:46		07:54 (LZ06)	07:21	07:01	07:35	
	16:56	17:37	18:13		19:51	50	08:41 (LZ06)	20:26	20:53	20:51	20:16		19:24	38	08:32 (LZ06)	18:29	16:46	16:32	
15	07:41	07:10	06:24		06:28		07:52 (LZ06)	05:45	05:27	05:40	06:12	08:12 (LZ06)	06:47		07:55 (LZ06)	07:23	07:03	07:36	
	16:57	17:38	18:15		19:52	49	08:41 (LZ06)	20:27	20:53	20:50	20:15	14	08:26 (LZ06)	19:22	35	08:30 (LZ06)	18:28	16:45	16:32
16	07:41	07:08	06:22		06:27		07:51 (LZ06)	05:44	05:27	05:41	06:14		08:09 (LZ06)	06:49	07:56 (LZ06)	07:24	07:04	07:37	
	16:58	17:40	18:16		19:53	49	08:40 (LZ06)	20:28	20:53	20:49	20:13	20	08:29 (LZ06)	19:20	32	08:28 (LZ06)	18:26	16:44	16:33
17	07:40	07:07	06:20		06:25		07:51 (LZ06)	05:43	05:27	05:42	06:15		08:06 (LZ06)	06:50	07:58 (LZ06)	07:25	07:05	07:37	
	16:59	17:41	18:17		19:54	47	08:38 (LZ06)	20:29	20:54	20:49	20:12	25	08:31 (LZ06)	19:18	27	08:25 (LZ06)	18:24	16:43	16:33
18	07:39	07:05	06:18		06:23		07:52 (LZ06)	05:42	05:27	05:43	06:16		08:04 (LZ06)	06:51	08:00 (LZ06)	07:26	07:07	07:38	
	17:00	17:42	18:18		19:56	46	08:38 (LZ06)	20:31	20:54	20:48	20:10	29	08:33 (LZ06)	19:16	22	08:22 (LZ06)	18:23	16:42	16:33
19	07:39	07:04	06:16		06:22		07:52 (LZ06)	05:41	05:27	05:44	06:17		08:03 (LZ06)	06:52	08:04 (LZ06)	07:28	07:08	07:39	
	17:02	17:44	18:19		19:57	44	08:36 (LZ06)	20:32	20:54	20:47	20:09	33	08:36 (LZ06)	19:14	13	08:17 (LZ06)	18:21	16:41	16:34
20	07:38	07:02	06:15		06:20		07:54 (LZ06)	05:40	05:27	05:45	06:18		08:01 (LZ06)	06:53		07:29	07:09	07:39	
	17:03	17:45	18:21		19:58	42	08:36 (LZ06)	20:33	20:55	20:46	20:07	36	08:37 (LZ06)	19:12		18:19	16:40	16:34	
21	07:37	07:01	06:13		06:18		07:54 (LZ06)	05:39	05:27	05:46	06:19		08:00 (LZ06)	06:54		07:30	07:10	07:40	
	17:04	17:46	18:22		19:59	40	08:34 (LZ06)	20:34	20:55	20:45	20:06	38	08:38 (LZ06)	19:11		18:18	16:39	16:34	
22	07:37	06:59	06:11		06:17		07:54 (LZ06)	05:38	05:27	05:47	06:20		07:58 (LZ06)	06:55		07:31	07:12	07:40	
	17:06	17:48	18:23		20:00	38	08:32 (LZ06)	20:35	20:55	20:45	20:04	41	08:39 (LZ06)	19:09		18:16	16:39	16:35	
23	07:36	06:58	06:09		06:15		07:56 (LZ06)	05:37	05:27	05:48	06:22		07:57 (LZ06)	06:57		07:33	07:13	07:41	
	17:07	17:49	18:24		20:02	35	08:31 (LZ06)	20:36	20:55	20:44	20:02	43	08:40 (LZ06)	19:07		18:15	16:38	16:35	
24	07:35	06:56	06:07	07:20 (LZ06)	06:14		07:57 (LZ06)	05:36	05:28	05:49	06:23		07:56 (LZ06)	06:58		07:34	07:14	07:41	
	17:08	17:50	18:26	8	07:28 (LZ06)	20:03	31	08:28 (LZ06)	20:37	20:56	20:43	44	08:40 (LZ06)	19:05		18:13	16:37	16:36	
25	07:34	06:55	06:06	07:14 (LZ06)	06:12		07:59 (LZ06)	05:36	05:28	05:50	06:24		07:55 (LZ06)	06:59		06:35	07:15	07:42	
	17:09	17:52	18:27	20	07:34 (LZ06)	20:04	28	08:27 (LZ06)	20:38	20:56	20:42	19:59	46	08:41 (LZ06)	19:03		17:12	16:37	16:37
26	07:34	06:53	06:04	07:10 (LZ06)	06:10		08:00 (LZ06)	05:35	05:28	05:51	06:25		07:54 (LZ06)	07:00		06:36	07:17	07:42	
	17:11	17:53	18:28	26	07:36 (LZ06)	20:05	24	08:24 (LZ06)	20:39	20:56	20:41	19:57	47	08:41 (LZ06)	19:01		17:10	16:36	16:37
27	07:33	06:51	06:02	07:07 (LZ06)	06:09		08:03 (LZ06)	05:34	05:29	05:52	06:26		07:53 (LZ06)	07:01		06:38	07:18	07:43	
	17:12	17:54	18:29	31	07:38 (LZ06)	20:06	19	08:22 (LZ06)	20:40	20:56	20:40	19:56	49	08:42 (LZ06)	19:00		17:09	16:36	16:38
28	07:32	06:50	06:00	07:05 (LZ06)	06:07		08:06 (LZ06)	05:33	05:29	05:53	06:27		07:52 (LZ06)	07:02		06:39	07:19	07:43	
	17:13	17:55	18:30	35	07:40 (LZ06)	20:08	11	08:17 (LZ06)	20:40	20:56	20:39	19:54	50	08:42 (LZ06)	18:58		17:07	16:35	16:39
29	07:31		06:58	08:04 (LZ06)	06:06		05:33	05:30	05:54	06:28			07:52 (LZ06)	07:03		06:40	07:20	07:43	
	17:15		19:32	38	08:42 (LZ06)	20:09		20:41	20:56	20:38	19:52	50	08:42 (LZ06)	18:56		17:06	16:35	16:39	
30	07:30		06:57	08:02 (LZ06)	06:04		05:32	05:30	05:55	06:29			07:51 (LZ06)	07:05		06:42	07:21	07:43	
	17:16		19:33	41	08:43 (LZ06)	20:10		20:42	20:56	20:36	19:50	51	08:42 (LZ06)	18:54		17:04	16:34	16:40	
31	07:29		06:55	08:00 (LZ06)			05:31		05:56	06:31			07:51 (LZ06)			06:43		07:43	
	17:18		19:34	43	08:43 (LZ06)			20:43		20:35	19:49	52	08:43 (LZ06)			17:03		16:41	
Potential sun hours	289	293	369		402		456	462	468	434		376			342	291	278		
Total, worst case			242		1210					668		804							
Sun reduction			0.31		0.40					0.65		0.59							
Oper. time red.			1.00		1.00					1.00		1.00							
Wind dir. red.			0.61		0.61					0.61		0.61							
Total reduction																			

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		





SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_03 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -87.1° Slope: 90.0° (34)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

January		February		March	April	May	June	
1	07:44		07:28	08:04 (LZ17)	06:48	06:53		07:28 (LZ06)
	16:42		17:19	08:25 (LZ17)	17:57	19:35		08:23 (LZ06)
2	07:44		07:27	08:04 (LZ17)	06:46	06:51		07:28 (LZ06)
	16:43		17:20	08:25 (LZ17)	17:58	19:36		08:22 (LZ06)
3	07:44		07:25	08:05 (LZ17)	06:45	06:49		07:29 (LZ06)
	16:44		17:22	08:23 (LZ17)	17:59	19:38		08:22 (LZ06)
4	07:44		07:24	08:06 (LZ17)	06:43	06:48		07:29 (LZ06)
	16:45		17:23	08:23 (LZ17)	18:01	19:39		08:21 (LZ06)
5	07:44		07:23	08:07 (LZ17)	06:41	06:46		07:29 (LZ06)
	16:46		17:24	08:22 (LZ17)	18:02	19:40		08:21 (LZ06)
6	07:44		07:22	08:10 (LZ17)	06:39	06:44		07:30 (LZ06)
	16:47		17:26	08:20 (LZ17)	18:03	19:41		08:21 (LZ06)
7	07:44		07:21	08:13 (LZ17)	06:38	06:42		07:30 (LZ06)
	16:48		17:27	08:15 (LZ17)	18:04	19:42		08:20 (LZ06)
8	07:43		07:19		06:36	06:40		07:31 (LZ06)
	16:49		17:29		18:06	19:44		08:20 (LZ06)
9	07:43		07:18		06:34	06:39		07:31 (LZ06)
	16:50		17:30		18:07	19:45		08:20 (LZ06)
10	07:43		07:17		06:33	06:37		07:32 (LZ06)
	16:51		17:31		18:08	19:46		08:21 (LZ06)
11	07:43		07:15		06:31	06:35		07:33 (LZ06)
	16:52		17:33		18:10	19:47		08:21 (LZ06)
12	07:42		07:14		06:29	06:33		07:32 (LZ06)
	16:53		17:34		18:11	19:48		08:20 (LZ06)
13	07:42		07:13		06:27	06:32		07:33 (LZ06)
	16:54		17:35		18:12	19:50		08:20 (LZ06)
14	07:41		07:11		06:25	06:30		07:33 (LZ06)
	16:56		17:37		18:13	19:51		08:20 (LZ06)
15	07:41		07:10		06:24	06:28		07:34 (LZ06)
	16:57		17:38		18:15	19:52		08:20 (LZ06)
16	07:41		07:08		06:22	06:27		07:34 (LZ06)
	16:58		17:40		18:16	19:53		08:20 (LZ06)
17	07:40		07:07		06:20	06:25		07:34 (LZ06)
	16:59		17:41		18:17	19:54		08:20 (LZ06)
18	07:39	08:08 (LZ17)	07:05		06:18	06:23		07:34 (LZ06)
	17:00	6 08:14 (LZ17)	17:42		18:18	19:56		08:20 (LZ06)
19	07:39	08:06 (LZ17)	07:04		06:16	06:22		07:36 (LZ06)
	17:02	10 08:16 (LZ17)	17:44		18:19	19:57		08:21 (LZ06)
20	07:38	08:04 (LZ17)	07:02		06:15	06:20		07:36 (LZ06)
	17:03	13 08:17 (LZ17)	17:45		18:21	19:58		08:21 (LZ06)
21	07:37	08:04 (LZ17)	07:01		06:13	06:18		07:36 (LZ06)
	17:04	16 08:20 (LZ17)	17:46		18:22	19:59		08:21 (LZ06)
22	07:37	08:03 (LZ17)	06:59		06:11	06:17		07:36 (LZ06)
	17:06	18 08:21 (LZ17)	17:48		18:23	20:00		08:21 (LZ06)
23	07:36	08:03 (LZ17)	06:58		06:09	06:15		07:36 (LZ06)
	17:07	19 08:22 (LZ17)	17:49		18:24	20:02		08:21 (LZ06)
24	07:35	08:02 (LZ17)	06:56		06:07	06:14		07:37 (LZ06)
	17:08	20 08:22 (LZ17)	17:50		18:26	20:03		08:22 (LZ06)
25	07:34	08:02 (LZ17)	06:55		06:06	06:12		07:36 (LZ06)
	17:09	21 08:23 (LZ17)	17:52		18:27	20:04		08:22 (LZ06)
26	07:34	08:02 (LZ17)	06:53		06:04	06:10		07:36 (LZ06)
	17:11	21 08:23 (LZ17)	17:53		18:28	20:05		08:22 (LZ06)
27	07:33	08:02 (LZ17)	06:51		06:02	06:09		07:37 (LZ06)
	17:12	22 08:24 (LZ17)	17:54		18:29	20:06		08:23 (LZ06)
28	07:32	08:02 (LZ17)	06:50		06:00	06:07		07:36 (LZ06)
	17:13	22 08:24 (LZ17)	17:55		18:30	20:08		08:23 (LZ06)
29	07:31	08:02 (LZ17)			06:58	06:06		07:37 (LZ06)
	17:15	23 08:25 (LZ17)			19:32	20:09		08:24 (LZ06)
30	07:30	08:03 (LZ17)			06:56	06:04		07:36 (LZ06)
	17:16	22 08:25 (LZ17)			19:33	20:10		08:24 (LZ06)
31	07:29	08:03 (LZ17)			06:55			
	17:18	22 08:25 (LZ17)			19:34			
Potential sun hours	289		293		369	402	456	462
Total, worst case	255		104			1037	2114	1438
Sun reduction	0.28		0.29			0.40	0.47	0.49
Oper. time red.	1.00		1.00			1.00	1.00	1.00
Wind dir. red.	0.66		0.66			0.59	0.60	0.60
Total reduction	0.19		0.19			0.24	0.28	0.30
Total, real	47		20			244	592	426

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_03 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -87.1° Slope: 90.0° (34)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

July		August		September		October		November		December	
1	05:31	07:37 (LZ06)	05:57	07:31 (LZ06)	06:32	07:06	06:44			07:22	
	20:56	48 08:25 (LZ06)	20:34	68 08:39 (LZ06)	19:47	18:52	17:01			16:34	
2	05:31	07:36 (LZ06)	05:58	07:31 (LZ06)	06:33	07:07	06:46			07:24	
	20:55	49 08:25 (LZ06)	20:33	68 08:39 (LZ06)	19:45	18:50	17:00			16:33	
3	05:32	07:37 (LZ06)	05:59	07:31 (LZ06)	06:34	07:08	06:47			07:25	
	20:55	49 08:26 (LZ06)	20:32	68 08:39 (LZ06)	19:43	18:49	16:59			16:33	
4	05:32	07:36 (LZ06)	06:00	07:31 (LZ06)	06:35	07:09	06:48		07:42 (LZ17)	07:26	
	20:55	49 08:25 (LZ06)	20:30	68 08:39 (LZ06)	19:42	18:47	16:57	4	07:46 (LZ17)	16:33	
5	05:33	07:36 (LZ06)	06:01	06:54 (LZ02)	06:36	07:11	06:50		07:39 (LZ17)	07:27	
	20:55	50 08:26 (LZ06)	20:29	73 08:40 (LZ06)	19:40	18:45	16:56	11	07:50 (LZ17)	16:32	
6	05:33	07:37 (LZ06)	06:02	06:51 (LZ02)	06:37	07:12	06:51		07:37 (LZ17)	07:28	
	20:54	50 08:27 (LZ06)	20:28	79 08:40 (LZ06)	19:38	18:43	16:55	15	07:52 (LZ17)	16:32	
7	05:34	07:36 (LZ06)	06:03	06:49 (LZ02)	06:38	07:13	06:52		07:37 (LZ17)	07:29	
	20:54	51 08:27 (LZ06)	20:26	82 08:40 (LZ06)	19:36	18:42	16:54	17	07:54 (LZ17)	16:32	
8	05:35	07:36 (LZ06)	06:05	06:48 (LZ02)	06:40	07:14	06:53		07:35 (LZ17)	07:30	
	20:54	52 08:28 (LZ06)	20:25	84 08:40 (LZ06)	19:34	18:40	16:52	19	07:54 (LZ17)	16:32	
9	05:35	07:36 (LZ06)	06:06	06:47 (LZ02)	06:41	07:15	06:55		07:34 (LZ17)	07:31	
	20:53	53 08:29 (LZ06)	20:24	85 08:39 (LZ06)	19:33	18:38	16:51	21	07:55 (LZ17)	16:32	
10	05:36	07:35 (LZ06)	06:07	06:46 (LZ02)	06:42	07:16	06:56		07:35 (LZ17)	07:32	
	20:53	54 08:29 (LZ06)	20:22	87 08:39 (LZ06)	19:31	18:36	16:50	21	07:56 (LZ17)	16:32	
11	05:37	07:35 (LZ06)	06:08	06:45 (LZ02)	06:43	07:18	06:57		07:34 (LZ17)	07:33	
	20:52	55 08:30 (LZ06)	20:21	88 08:39 (LZ06)	19:29	18:35	16:49	22	07:56 (LZ17)	16:32	
12	05:38	07:35 (LZ06)	06:09	06:44 (LZ02)	06:44	07:19	06:59		07:34 (LZ17)	07:33	
	20:52	56 08:31 (LZ06)	20:19	88 08:38 (LZ06)	19:27	18:33	16:48	23	07:57 (LZ17)	16:32	
13	05:39	07:35 (LZ06)	06:10	06:44 (LZ02)	06:45	07:20	07:00		07:34 (LZ17)	07:34	
	20:51	56 08:31 (LZ06)	20:18	87 08:38 (LZ06)	19:25	18:31	16:47	23	07:57 (LZ17)	16:32	
14	05:39	07:34 (LZ06)	06:11	06:44 (LZ02)	06:46	07:21	07:01		07:34 (LZ17)	07:35	
	20:51	57 08:31 (LZ06)	20:16	86 08:37 (LZ06)	19:24	18:29	16:46	22	07:56 (LZ17)	16:32	
15	05:40	07:34 (LZ06)	06:12	06:43 (LZ02)	06:47	07:23	07:03		07:35 (LZ17)	07:36	
	20:50	58 08:32 (LZ06)	20:15	86 08:36 (LZ06)	19:22	18:28	16:45	22	07:57 (LZ17)	16:32	
16	05:41	07:34 (LZ06)	06:14	06:43 (LZ02)	06:49	07:24	07:04		07:35 (LZ17)	07:37	
	20:49	59 08:33 (LZ06)	20:13	84 08:36 (LZ06)	19:20	18:26	16:44	21	07:56 (LZ17)	16:33	
17	05:42	07:34 (LZ06)	06:15	06:43 (LZ02)	06:50	07:25	07:05		07:36 (LZ17)	07:37	
	20:49	59 08:33 (LZ06)	20:12	83 08:35 (LZ06)	19:18	18:24	16:43	21	07:57 (LZ17)	16:33	
18	05:43	07:34 (LZ06)	06:16	06:44 (LZ02)	06:51	07:26	07:07		07:36 (LZ17)	07:38	
	20:48	60 08:34 (LZ06)	20:10	79 08:34 (LZ06)	19:16	18:23	16:42	20	07:56 (LZ17)	16:33	
19	05:44	07:34 (LZ06)	06:17	06:45 (LZ02)	06:52	07:28	07:08		07:37 (LZ17)	07:39	
	20:47	61 08:35 (LZ06)	20:09	77 08:34 (LZ06)	19:14	18:21	16:41	19	07:56 (LZ17)	16:34	
20	05:45	07:34 (LZ06)	06:18	06:46 (LZ02)	06:53	07:29	07:09		07:38 (LZ17)	07:39	
	20:46	61 08:35 (LZ06)	20:07	73 08:33 (LZ06)	19:12	18:19	16:40	18	07:56 (LZ17)	16:34	
21	05:46	07:34 (LZ06)	06:19	06:47 (LZ02)	06:54	07:30	07:10		07:39 (LZ17)	07:40	
	20:45	62 08:36 (LZ06)	20:06	67 08:31 (LZ06)	19:11	18:18	16:39	16	07:55 (LZ17)	16:34	
22	05:47	07:33 (LZ06)	06:20	06:49 (LZ02)	06:55	07:31	07:12		07:40 (LZ17)	07:40	
	20:45	63 08:36 (LZ06)	20:04	60 08:30 (LZ06)	19:09	18:16	16:39	14	07:54 (LZ17)	16:35	
23	05:48	07:32 (LZ06)	06:21	07:40 (LZ06)	06:57	07:33	07:13		07:43 (LZ17)	07:41	
	20:44	64 08:36 (LZ06)	20:02	48 08:28 (LZ06)	19:07	18:15	16:38	10	07:53 (LZ17)	16:35	
24	05:49	07:32 (LZ06)	06:23	07:41 (LZ06)	06:58	07:34	07:14		07:45 (LZ17)	07:41	
	20:43	65 08:37 (LZ06)	20:01	45 08:26 (LZ06)	19:05	18:13	16:37	6	07:51 (LZ17)	16:36	
25	05:50	07:32 (LZ06)	06:24	07:42 (LZ06)	06:59	06:35	07:15			07:42	
	20:42	65 08:37 (LZ06)	19:59	42 08:24 (LZ06)	19:03	17:12	16:37			16:37	
26	05:51	07:32 (LZ06)	06:25	07:44 (LZ06)	07:00	06:36	07:17			07:42	
	20:41	65 08:37 (LZ06)	19:57	38 08:22 (LZ06)	19:01	17:10	16:36			16:37	
27	05:52	07:32 (LZ06)	06:26	07:46 (LZ06)	07:01	06:38	07:18			07:42	
	20:40	66 08:38 (LZ06)	19:56	33 08:19 (LZ06)	19:00	17:09	16:36			16:38	
28	05:53	07:32 (LZ06)	06:27	07:49 (LZ06)	07:02	06:39	07:19			07:43	
	20:39	66 08:38 (LZ06)	19:54	26 08:15 (LZ06)	18:58	17:07	16:35			16:39	
29	05:54	07:32 (LZ06)	06:28	07:53 (LZ06)	07:03	06:40	07:20			07:43	
	20:37	66 08:38 (LZ06)	19:52	18 08:11 (LZ06)	18:56	17:06	16:35			16:39	
30	05:55	07:31 (LZ06)	06:29		07:05	06:42	07:21			07:43	
	20:36	68 08:39 (LZ06)	19:50		18:54	17:04	16:34			16:40	
31	05:56	07:31 (LZ06)	06:31			06:43				07:43	
	20:35	68 08:39 (LZ06)	19:49			17:03				16:41	
Potential sun hours	468		434		376	342	291			278	
Total, worst case	1805		1970				365				
Sun reduction	0.59		0.65				0.36				
Oper. time red.	1.00		1.00				1.00				
Wind dir. red.	0.60		0.59				0.66				
Total reduction	0.35		0.38				0.24				
Total, real	635		757				88				

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

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





SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_04 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -91.1° Slope: 90.0° (35)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January			February			March			April			May			June		
1	07:44		09:00 (LZ16)	07:28		07:54 (LZ17)	06:48		06:53			06:03			06:28 (LZ02)	05:31		06:52 (LZ06)
	16:42	26	09:26 (LZ16)	17:19	18	08:12 (LZ17)	17:57		19:35			20:11	17		06:45 (LZ02)	20:44	63	07:55 (LZ06)
2	07:44		09:01 (LZ16)	07:27		07:54 (LZ17)	06:46		06:51			06:02			06:27 (LZ02)	05:30		06:52 (LZ06)
	16:43	25	09:26 (LZ16)	17:20	20	08:14 (LZ17)	17:58		19:36			20:12	19		06:46 (LZ02)	20:45	63	07:55 (LZ06)
3	07:44		09:02 (LZ16)	07:25		07:53 (LZ17)	06:45		06:49			06:00			06:27 (LZ02)	05:30		06:52 (LZ06)
	16:44	24	09:26 (LZ16)	17:22	20	08:13 (LZ17)	17:59		19:38			20:13	20		06:47 (LZ02)	20:46	64	07:56 (LZ06)
4	07:44		09:03 (LZ16)	07:24		07:53 (LZ17)	06:43		06:48			05:59			06:26 (LZ02)	05:29		06:51 (LZ06)
	16:45	23	09:26 (LZ16)	17:23	21	08:14 (LZ17)	18:01		19:39			20:15	21		06:47 (LZ02)	20:46	64	07:55 (LZ06)
5	07:44		09:03 (LZ16)	07:23		07:53 (LZ17)	06:41		06:46			05:57			06:26 (LZ02)	05:29		06:52 (LZ06)
	16:46	22	09:25 (LZ16)	17:24	22	08:15 (LZ17)	18:02		19:40			20:16	21		06:47 (LZ02)	20:47	64	07:56 (LZ06)
6	07:44		09:04 (LZ16)	07:22		07:53 (LZ17)	06:39		06:44			05:56			06:26 (LZ02)	05:28		06:52 (LZ06)
	16:47	21	09:25 (LZ16)	17:26	22	08:15 (LZ17)	18:03		19:41			20:17	22		06:48 (LZ02)	20:48	65	07:57 (LZ06)
7	07:44		09:05 (LZ16)	07:21		07:52 (LZ17)	06:38		06:42			05:55			06:25 (LZ02)	05:28		06:51 (LZ06)
	16:48	20	09:25 (LZ16)	17:27	23	08:15 (LZ17)	18:04		19:42			20:18	22		06:47 (LZ02)	20:48	65	07:56 (LZ06)
8	07:43		09:07 (LZ16)	07:19		07:53 (LZ17)	06:36		06:40			05:53			06:25 (LZ02)	05:28		06:52 (LZ06)
	16:49	18	09:25 (LZ16)	17:29	22	08:15 (LZ17)	18:06		19:44			20:19	28		07:26 (LZ06)	20:49	65	07:57 (LZ06)
9	07:43		09:08 (LZ16)	07:18		07:54 (LZ17)	06:34		06:39			05:52			06:25 (LZ02)	05:28		06:52 (LZ06)
	16:50	15	09:23 (LZ16)	17:30	21	08:15 (LZ17)	18:07		19:45			20:20	40		07:32 (LZ06)	20:50	65	07:57 (LZ06)
10	07:43		09:10 (LZ16)	07:17		07:53 (LZ17)	06:33		06:37			05:51			06:26 (LZ02)	05:27		06:52 (LZ06)
	16:51	13	09:23 (LZ16)	17:31	21	08:14 (LZ17)	18:08		19:46			20:22	47		07:36 (LZ06)	20:50	66	07:58 (LZ06)
11	07:43		09:13 (LZ16)	07:15		07:55 (LZ17)	06:31		06:35			05:50			06:26 (LZ02)	05:27		06:53 (LZ06)
	16:52	8	09:21 (LZ16)	17:33	19	08:14 (LZ17)	18:10		19:47			20:23	50		07:38 (LZ06)	20:51	65	07:58 (LZ06)
12	07:42			17:14		07:56 (LZ17)	06:29		06:33			05:48			06:27 (LZ02)	05:27		06:52 (LZ06)
	16:53			17:34	17	08:13 (LZ17)	18:11		19:48			20:24	53		07:40 (LZ06)	20:52	65	07:57 (LZ06)
13	07:42			17:13		07:57 (LZ17)	06:27		06:32			05:47			06:27 (LZ02)	05:27		06:52 (LZ06)
	16:54			17:35	14	08:11 (LZ17)	18:12		19:50			20:25	55		07:41 (LZ06)	20:52	66	07:58 (LZ06)
14	07:41			17:11		07:59 (LZ17)	06:25		06:30			05:46			06:28 (LZ02)	05:27		06:52 (LZ06)
	16:56			17:37	10	08:09 (LZ17)	18:13		19:51			20:26	56		07:43 (LZ06)	20:53	66	07:58 (LZ06)
15	07:41			17:10			06:24		06:28			05:45			06:29 (LZ02)	05:27		06:52 (LZ06)
	16:57			17:38			18:15		19:52			20:27	56		07:44 (LZ06)	20:53	66	07:58 (LZ06)
16	07:41			17:08			06:22		06:27			05:44			06:31 (LZ02)	05:27		06:52 (LZ06)
	16:58			17:40			18:16		19:53			20:28	55		07:45 (LZ06)	20:53	66	07:58 (LZ06)
17	07:40			17:07			06:20		06:25			05:43			06:34 (LZ02)	05:27		06:53 (LZ06)
	16:59			17:41			18:17		19:54			20:29	51		07:46 (LZ06)	20:54	66	07:59 (LZ06)
18	07:39			17:05			06:18		06:23			05:42			06:57 (LZ06)	05:27		06:53 (LZ06)
	17:00			17:42			18:18		19:56			20:30	50		07:47 (LZ06)	20:54	66	07:59 (LZ06)
19	07:39			17:04			06:16		06:22			05:41			06:57 (LZ06)	05:27		06:54 (LZ06)
	17:02			17:44			18:19		19:57			20:32	52		07:49 (LZ06)	20:54	66	08:00 (LZ06)
20	07:38			17:02			06:15		06:20			05:40			06:57 (LZ06)	05:27		06:54 (LZ06)
	17:03			17:45			18:21		19:58			20:33	52		07:49 (LZ06)	20:55	66	08:00 (LZ06)
21	07:37			17:01			06:13		06:18			05:39			06:56 (LZ06)	05:27		06:54 (LZ06)
	17:04			17:46			18:22		19:59			20:34	54		07:50 (LZ06)	20:55	66	08:00 (LZ06)
22	07:37			17:06			06:11		06:17			05:38			06:55 (LZ06)	05:27		06:54 (LZ06)
	17:06			17:48			18:23		20:00			20:35	55		07:50 (LZ06)	20:55	66	08:00 (LZ06)
23	07:36			17:06			06:09		06:15			05:37			06:54 (LZ06)	05:27		06:54 (LZ06)
	17:07			17:49			18:24		20:02			20:36	57		07:51 (LZ06)	20:55	66	08:00 (LZ06)
24	07:35			17:08			06:07		06:14			05:36			06:53 (LZ06)	05:28		06:55 (LZ06)
	17:08			17:50			18:26		20:03			20:37	58		07:51 (LZ06)	20:56	66	08:01 (LZ06)
25	07:34			17:09			06:06		06:12			05:36			06:54 (LZ06)	05:28		06:55 (LZ06)
	17:09			17:52			18:27		20:04			20:38	58		07:52 (LZ06)	20:56	66	08:01 (LZ06)
26	07:34			17:11			06:04		06:10			05:35			06:53 (LZ06)	05:28		06:54 (LZ06)
	17:11			17:53			18:28		20:05			20:39	59		07:52 (LZ06)	20:56	67	08:01 (LZ06)
27	07:33			17:12			06:02		06:09			05:34			06:52 (LZ06)	05:29		06:55 (LZ06)
	17:12			17:54			18:29		20:06			20:40	61		07:53 (LZ06)	20:56	66	08:01 (LZ06)
28	07:32			17:13			06:00		06:07			05:33			06:53 (LZ06)	05:29		06:55 (LZ06)
	17:13			17:55			18:30		20:08			20:40	61		07:54 (LZ06)	20:56	66	08:01 (LZ06)
29	07:31		07:58 (LZ17)				06:58		06:06		6	06:40 (LZ02)			06:52 (LZ06)	05:30		06:56 (LZ06)
	17:15	9	08:07 (LZ17)				19:32		20:09		12	06:43 (LZ02)			07:54 (LZ06)	20:56	66	08:02 (LZ06)
30	07:30		07:56 (LZ17)				06:56		06:04			06:30 (LZ02)			06:53 (LZ06)	05:30		06:56 (LZ06)
	17:16	13	08:09 (LZ17)				19:33		20:10		15	06:45 (LZ02)			07:55 (LZ06)	20:56	66	08:02 (LZ06)
31	07:29		07:55 (LZ17)				06:55					05:31			06:52 (LZ06)			
	17:18	16	08:11 (LZ17)				19:34					20:43	62		07:54 (LZ06)			
Potential sun hours	289			293			369		402			456				462		
Total, worst case	253			270					33			1436					1963	
Sun reduction	0.28			0.29					0.40			0.47					0.49	
Oper. time red.	1.00			1.00					1.00			1.00					1.00	
Wind dir. red.	0.67			0.66					0.57			0.57					0.57	
Total reduction	0.19			0.19					0.23			0.27					0.28	
Total, real	47			51					8			384					553	

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_04 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -91.1° Slope: 90.0° (35)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

July		August		September		October		November		December	
1	05:31	06:57 (LZ06)	05:57	06:36 (LZ02)	06:32	07:06		06:44		07:23 (LZ17)	07:22
	20:56	65 08:02 (LZ06)	20:34	52 07:49 (LZ06)	19:47	18:52		17:01	21 07:44 (LZ17)	16:34	8 09:03 (LZ16)
2	05:31	06:56 (LZ06)	05:58	06:36 (LZ02)	06:33	07:07		06:46		07:22 (LZ17)	07:24
	20:55	66 08:02 (LZ06)	20:33	49 07:47 (LZ06)	19:45	18:50		17:00	22 07:44 (LZ17)	16:33	13 09:06 (LZ16)
3	05:32	06:57 (LZ06)	05:59	06:35 (LZ02)	06:34	07:08		06:47		07:23 (LZ17)	07:25
	20:55	65 08:02 (LZ06)	20:32	44 07:44 (LZ06)	19:43	18:49		16:59	22 07:45 (LZ17)	16:33	15 09:07 (LZ16)
4	05:32	06:57 (LZ06)	06:00	06:35 (LZ02)	06:35	07:09		06:48		07:22 (LZ17)	07:26
	20:55	65 08:02 (LZ06)	20:30	36 07:40 (LZ06)	19:42	18:47		16:57	23 07:45 (LZ17)	16:33	18 09:09 (LZ16)
5	05:33	06:58 (LZ06)	06:01	06:35 (LZ02)	06:36	07:11		06:50		07:23 (LZ17)	07:27
	20:55	65 08:03 (LZ06)	20:29	23 06:58 (LZ02)	19:40	18:45		16:56	22 07:45 (LZ17)	16:32	19 09:10 (LZ16)
6	05:33	06:58 (LZ06)	06:02	06:35 (LZ02)	06:37	07:12		06:51		07:22 (LZ17)	07:28
	20:54	65 08:03 (LZ06)	20:28	22 06:57 (LZ02)	19:38	18:43		16:55	23 07:45 (LZ17)	16:32	21 09:11 (LZ16)
7	05:34	06:58 (LZ06)	06:03	06:35 (LZ02)	06:38	07:13		06:52		07:23 (LZ17)	07:29
	20:54	64 08:02 (LZ06)	20:26	22 06:57 (LZ02)	19:36	18:42		16:54	22 07:45 (LZ17)	16:32	22 09:12 (LZ16)
8	05:35	06:59 (LZ06)	06:05	06:35 (LZ02)	06:40	07:14		06:53		07:24 (LZ17)	07:30
	20:54	64 08:03 (LZ06)	20:25	22 06:57 (LZ02)	19:34	18:40		16:52	20 07:44 (LZ17)	16:32	23 09:13 (LZ16)
9	05:36	06:59 (LZ06)	06:06	06:35 (LZ02)	06:41	07:15		06:55		07:24 (LZ17)	07:31
	20:53	64 08:03 (LZ06)	20:24	21 06:56 (LZ02)	19:33	18:38		16:51	19 07:43 (LZ17)	16:32	24 09:14 (LZ16)
10	05:36	06:59 (LZ06)	06:07	06:36 (LZ02)	06:42	07:16		06:56		07:25 (LZ17)	07:32
	20:53	63 08:02 (LZ06)	20:22	20 06:56 (LZ02)	19:31	18:36		16:50	18 07:43 (LZ17)	16:32	25 09:15 (LZ16)
11	05:37	06:59 (LZ06)	06:08	06:36 (LZ02)	06:43	07:18		06:57		07:26 (LZ17)	07:33
	20:52	64 08:03 (LZ06)	20:21	19 06:55 (LZ02)	19:29	18:35		16:49	16 07:42 (LZ17)	16:32	26 09:16 (LZ16)
12	05:38	07:00 (LZ06)	06:09	06:37 (LZ02)	06:44	07:19		06:59		07:28 (LZ17)	07:33
	20:52	63 08:03 (LZ06)	20:19	17 06:54 (LZ02)	19:27	18:33		16:48	13 07:41 (LZ17)	16:32	27 09:17 (LZ16)
13	05:39	07:01 (LZ06)	06:10	06:38 (LZ02)	06:45	07:20		07:00		07:30 (LZ17)	07:34
	20:51	62 08:03 (LZ06)	20:18	14 06:52 (LZ02)	19:25	18:31		16:47	9 07:39 (LZ17)	16:32	27 09:18 (LZ16)
14	05:39	07:00 (LZ06)	06:11	06:39 (LZ02)	06:46	07:21		07:01		07:35	
	20:51	62 08:02 (LZ06)	20:16	11 06:50 (LZ02)	19:24	18:29		16:46		16:32	28 09:18 (LZ16)
15	05:40	07:01 (LZ06)	06:12	06:43 (LZ02)	06:47	07:23		07:03		07:36	
	20:50	61 08:02 (LZ06)	20:15	3 06:46 (LZ02)	19:22	18:28		16:45		16:32	27 09:18 (LZ16)
16	05:41	07:02 (LZ06)	06:14		06:49	07:24		07:04		07:37	
	20:49	60 08:02 (LZ06)	20:13		19:20	18:26		16:44		16:33	28 09:19 (LZ16)
17	05:42	07:02 (LZ06)	06:15		06:50	07:25		07:05		07:37	
	20:49	60 08:02 (LZ06)	20:12		19:18	18:24		16:43		16:33	28 09:20 (LZ16)
18	05:43	07:03 (LZ06)	06:16		06:51	07:26		07:07		07:38	
	20:48	59 08:02 (LZ06)	20:10		19:16	18:23		16:42		16:33	28 09:20 (LZ16)
19	05:44	07:04 (LZ06)	06:17		06:52	07:28		07:08		07:39	
	20:47	58 08:02 (LZ06)	20:09		19:14	18:21		16:41		16:34	29 09:21 (LZ16)
20	05:45	07:04 (LZ06)	06:18		06:53	07:29		07:09		07:39	
	20:46	57 08:01 (LZ06)	20:07		19:12	18:19		16:40		16:34	29 09:21 (LZ16)
21	05:46	07:05 (LZ06)	06:19		06:54	07:30		07:10		07:40	
	20:45	56 08:01 (LZ06)	20:06		19:11	18:18		16:39		16:34	29 09:22 (LZ16)
22	05:47	07:05 (LZ06)	06:20		06:55	07:31		07:12		07:40	
	20:45	55 08:00 (LZ06)	20:04		19:09	18:16		16:39		16:35	29 09:22 (LZ16)
23	05:48	07:06 (LZ06)	06:21		06:57	07:33		07:13		07:41	
	20:44	53 07:59 (LZ06)	20:02		19:07	18:15		16:38		16:35	29 09:23 (LZ16)
24	05:49	07:06 (LZ06)	06:23		06:58	07:34		07:14		07:41	
	20:43	53 07:59 (LZ06)	20:01		19:05	18:13		16:37		16:36	29 09:23 (LZ16)
25	05:50	07:07 (LZ06)	06:24		06:59	06:35		07:15		07:42	
	20:42	51 07:58 (LZ06)	19:59		19:03	17:12		16:37		16:37	28 09:24 (LZ16)
26	05:51	07:08 (LZ06)	06:25		07:00	06:36		07:17		07:42	
	20:41	49 07:57 (LZ06)	19:57		19:01	17:10		16:36		16:37	28 09:24 (LZ16)
27	05:52	06:43 (LZ02)	06:26		07:01	06:38		07:18		07:42	
	20:40	53 07:56 (LZ06)	19:56		19:00	17:09	3 07:35 (LZ17)	16:36		16:38	28 09:24 (LZ16)
28	05:53	06:40 (LZ02)	06:27		07:02	06:39		07:19		07:43	
	20:39	57 07:55 (LZ06)	19:54		18:58	17:07	12 07:40 (LZ17)	16:35		16:39	27 09:24 (LZ16)
29	05:54	06:39 (LZ02)	06:28		07:03	06:40		07:20		07:43	
	20:37	56 07:54 (LZ06)	19:52		18:56	17:06	15 07:41 (LZ17)	16:35		16:39	28 09:25 (LZ16)
30	05:55	06:38 (LZ02)	06:29		07:05	06:42		07:21		07:43	
	20:36	56 07:53 (LZ06)	19:50		18:54	17:04	18 07:42 (LZ17)	16:34		16:40	27 09:26 (LZ16)
31	05:56	06:37 (LZ02)	06:31			06:43		07:24 (LZ17)		07:43	
	20:35	54 07:51 (LZ06)	19:49			17:03	20 07:44 (LZ17)			16:41	27 09:26 (LZ16)
Potential sun hours	468		434		376	342		291		278	
Total, worst case	1845		375		68			250		774	
Sun reduction	0.59		0.65		0.47			0.36		0.26	
Oper. time red.	1.00		1.00		1.00			1.00		1.00	
Wind dir. red.	0.57		0.57		0.66			0.66		0.67	
Total reduction	0.33		0.37		0.31			0.24		0.18	
Total, real	617		139		21			60		137	

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_05 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -89.3° Slope: 90.0° (36)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

January			February			March			April			May			June		
1	07:44		08:44 (LZ16)	07:28		06:48	06:53	06:03							05:31		
	16:42	36	09:20 (LZ16)	17:19			17:57	19:35	20:11						20:44		
2	07:44		08:45 (LZ16)	07:27		06:46	06:51	06:02							05:30		06:57 (LZ06)
	16:43	35	09:20 (LZ16)	17:20			17:58	19:36	20:12						20:45	7	07:04 (LZ06)
3	07:44		08:45 (LZ16)	07:25		06:45	06:49	06:00							05:30		06:54 (LZ06)
	16:44	36	09:21 (LZ16)	17:22			17:59	19:38	20:13						20:46	14	07:08 (LZ06)
4	07:44		08:46 (LZ16)	07:24		07:55 (LZ17)	06:43	06:48	05:59		06:25 (LZ02)	05:29			05:29		06:51 (LZ06)
	16:45	35	09:21 (LZ16)	17:23	1	07:56 (LZ17)	18:01	19:39	20:15	8	06:33 (LZ02)	20:46	18		07:09 (LZ06)		
5	07:44		08:45 (LZ16)	07:23		07:51 (LZ17)	06:41	06:46	05:57		06:23 (LZ02)	05:29			06:50 (LZ06)		
	16:46	36	09:21 (LZ16)	17:24	10	08:01 (LZ17)	18:02	19:40	20:16	12	06:35 (LZ02)	20:47	22		07:12 (LZ06)		
6	07:44		08:46 (LZ16)	07:22		07:49 (LZ17)	06:39	06:44	05:56		06:22 (LZ02)	05:28			06:49 (LZ06)		
	16:47	35	09:21 (LZ16)	17:26	14	08:03 (LZ17)	18:03	19:41	20:17	15	06:37 (LZ02)	20:48	24		07:13 (LZ06)		
7	07:44		08:47 (LZ16)	07:21		07:47 (LZ17)	06:38	06:42	05:55		06:20 (LZ02)	05:28			06:48 (LZ06)		
	16:48	35	09:22 (LZ16)	17:27	17	08:04 (LZ17)	18:04	19:42	20:18	17	06:37 (LZ02)	20:48	26		07:14 (LZ06)		
8	07:43		08:48 (LZ16)	07:19		07:46 (LZ17)	06:36	06:40	05:53		06:19 (LZ02)	05:28			06:47 (LZ06)		
	16:49	34	09:22 (LZ16)	17:29	19	08:05 (LZ17)	18:06	19:44	20:19	19	06:38 (LZ02)	20:49	28		07:15 (LZ06)		
9	07:43		08:48 (LZ16)	07:18		07:46 (LZ17)	06:34	06:39	05:52		06:19 (LZ02)	05:28			06:47 (LZ06)		
	16:50	34	09:22 (LZ16)	17:30	21	08:07 (LZ17)	18:07	19:45	20:20	20	06:39 (LZ02)	20:50	29		07:16 (LZ06)		
10	07:43		08:49 (LZ16)	07:17		07:45 (LZ17)	06:33	06:37	05:51		06:19 (LZ02)	05:27			06:47 (LZ06)		
	16:51	33	09:22 (LZ16)	17:31	22	08:07 (LZ17)	18:08	19:46	20:22	20	06:39 (LZ02)	20:50	31		07:18 (LZ06)		
11	07:43		08:50 (LZ16)	07:15		07:45 (LZ17)	06:31	06:35	05:50		06:18 (LZ02)	05:27			06:46 (LZ06)		
	16:52	33	09:23 (LZ16)	17:33	22	08:07 (LZ17)	18:10	19:47	20:23	22	06:40 (LZ02)	20:51	32		07:18 (LZ06)		
12	07:42		08:50 (LZ16)	07:14		07:45 (LZ17)	06:29	06:33	05:48		06:18 (LZ02)	05:27			06:45 (LZ06)		
	16:53	32	09:22 (LZ16)	17:34	23	08:08 (LZ17)	18:11	19:48	20:24	22	06:40 (LZ02)	20:52	33		07:18 (LZ06)		
13	07:42		08:51 (LZ16)	07:13		07:45 (LZ17)	06:27	06:32	05:47		06:17 (LZ02)	05:27			06:45 (LZ06)		
	16:54	32	09:23 (LZ16)	17:35	22	08:07 (LZ17)	18:12	19:50	20:25	22	06:39 (LZ02)	20:52	34		07:19 (LZ06)		
14	07:41		08:51 (LZ16)	07:11		07:45 (LZ17)	06:25	06:30	05:46		06:17 (LZ02)	05:27			06:45 (LZ06)		
	16:56	31	09:22 (LZ16)	17:37	23	08:08 (LZ17)	18:13	19:51	20:26	22	06:39 (LZ02)	20:53	35		07:20 (LZ06)		
15	07:41		08:53 (LZ16)	07:10		07:45 (LZ17)	06:24	06:28	05:45		06:18 (LZ02)	05:27			06:45 (LZ06)		
	16:57	29	09:22 (LZ16)	17:38	22	08:07 (LZ17)	18:15	19:52	20:27	21	06:39 (LZ02)	20:53	35		07:20 (LZ06)		
16	07:41		08:53 (LZ16)	07:08		07:46 (LZ17)	06:22	06:27	05:44		06:18 (LZ02)	05:27			06:45 (LZ06)		
	16:58	29	09:22 (LZ16)	17:40	21	08:07 (LZ17)	18:16	19:53	20:28	21	06:39 (LZ02)	20:53	36		07:21 (LZ06)		
17	07:40		08:54 (LZ16)	07:07		07:46 (LZ17)	06:20	06:25	05:43		06:18 (LZ02)	05:27			06:45 (LZ06)		
	16:59	27	09:21 (LZ16)	17:41	19	08:05 (LZ17)	18:17	19:54	20:29	20	06:38 (LZ02)	20:54	36		07:21 (LZ06)		
18	07:39		08:55 (LZ16)	07:05		07:48 (LZ17)	06:18	06:23	05:42		06:18 (LZ02)	05:27			06:44 (LZ06)		
	17:00	26	09:21 (LZ16)	17:42	17	08:05 (LZ17)	18:18	19:56	20:30	20	06:38 (LZ02)	20:54	37		07:21 (LZ06)		
19	07:39		08:56 (LZ16)	07:04		07:49 (LZ17)	06:16	06:22	05:41		06:20 (LZ02)	05:27			06:45 (LZ06)		
	17:02	24	09:20 (LZ16)	17:44	14	08:03 (LZ17)	18:19	19:57	20:32	18	06:38 (LZ02)	20:54	37		07:22 (LZ06)		
20	07:38		08:57 (LZ16)	07:02		07:52 (LZ17)	06:15	06:20	05:40		06:20 (LZ02)	05:27			06:45 (LZ06)		
	17:03	22	09:19 (LZ16)	17:45	9	08:01 (LZ17)	18:21	19:58	20:33	18	06:38 (LZ02)	20:55	38		07:23 (LZ06)		
21	07:37		09:00 (LZ16)	07:01		06:13	06:18	05:39			06:21 (LZ02)	05:27			06:45 (LZ06)		
	17:04	19	09:19 (LZ16)	17:46		18:22	19:59	20:34	16		06:37 (LZ02)	20:55	38		07:23 (LZ06)		
22	07:37		09:01 (LZ16)	06:59		06:11	06:17	05:38			06:22 (LZ02)	05:27			06:45 (LZ06)		
	17:06	16	09:17 (LZ16)	17:48		18:23	20:00	20:35	14		06:36 (LZ02)	20:55	38		07:23 (LZ06)		
23	07:36		09:04 (LZ16)	06:58		06:09	06:15	05:37			06:23 (LZ02)	05:27			06:45 (LZ06)		
	17:07	11	09:15 (LZ16)	17:49		18:24	20:02	20:36	12		06:35 (LZ02)	20:55	38		07:23 (LZ06)		
24	07:35			06:56		06:07	06:14	05:36			06:24 (LZ02)	05:28			06:46 (LZ06)		
	17:08			17:50		18:26	20:03	20:37	9		06:33 (LZ02)	20:56	37		07:23 (LZ06)		
25	07:34			06:55		06:06	06:12	05:36			06:27 (LZ02)	05:28			06:46 (LZ06)		
	17:09			17:52		18:27	20:04	20:38	4		06:31 (LZ02)	20:56	37		07:23 (LZ06)		
26	07:33			06:53		06:04	06:10	05:35				05:28			06:47 (LZ06)		
	17:11			17:53		18:28	20:05	20:39				20:56	36		07:23 (LZ06)		
27	07:33			06:51		06:02	06:09	05:34				05:29			06:48 (LZ06)		
	17:12			17:54		18:29	20:06	20:40				20:56	35		07:23 (LZ06)		
28	07:32			06:50		06:00	06:07	05:33				05:29			06:48 (LZ06)		
	17:13			17:55		18:30	20:08	20:40				20:56	35		07:23 (LZ06)		
29	07:31					06:58	06:06	05:33				05:30			06:49 (LZ06)		
	17:15					19:32	20:09	20:41				20:56	34		07:23 (LZ06)		
30	07:30					06:56	06:04	05:32				05:30			06:49 (LZ06)		
	17:16					19:33	20:10	20:42				20:56	34		07:23 (LZ06)		
31	07:29					06:55		05:31									
	17:18					19:34		20:43									
Potential sun hours	289			293		369	402	456							462		
Total, worst case		680		296				372							914		
Sun reduction		0.28		0.29				0.47							0.49		
Oper. time red.		1.00		1.00				1.00							1.00		
Wind dir. red.		0.66		0.65				0.58							0.59		
Total reduction		0.19		0.19				0.27							0.29		
Total, real		126		56				101							268		

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_05 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -89.3° Slope: 90.0° (36)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July			August			September			October			November			December		
1	05:31		06:50 (LZ06)	05:57		06:28 (LZ02)	06:32		07:06			06:44		07:15 (LZ17)	07:22		08:32 (LZ16)	
	20:56	33	07:23 (LZ06)	20:34	22	06:50 (LZ02)	19:47		18:52			17:01	21	07:36 (LZ17)	16:34	33	09:05 (LZ16)	
2	05:31		06:50 (LZ06)	05:58		06:28 (LZ02)	06:33		07:07			06:46		07:15 (LZ17)	07:24		08:32 (LZ16)	
	20:55	32	07:22 (LZ06)	20:33	21	06:49 (LZ02)	19:45		18:50			17:00	20	07:35 (LZ17)	16:33	33	09:05 (LZ16)	
3	05:32		06:52 (LZ06)	05:59		06:28 (LZ02)	06:34		07:08			06:47		07:16 (LZ17)	07:25		08:32 (LZ16)	
	20:55	30	07:22 (LZ06)	20:32	21	06:49 (LZ02)	19:43		18:49			16:59	19	07:35 (LZ17)	16:33	34	09:06 (LZ16)	
4	05:32		06:52 (LZ06)	06:00		06:29 (LZ02)	06:35		07:09			06:48		07:17 (LZ17)	07:26		08:32 (LZ16)	
	20:55	29	07:21 (LZ06)	20:30	19	06:48 (LZ02)	19:42		18:47			16:57	17	07:34 (LZ17)	16:33	34	09:06 (LZ16)	
5	05:33		06:54 (LZ06)	06:01		06:30 (LZ02)	06:36		07:11			06:50		07:19 (LZ17)	07:27		08:32 (LZ16)	
	20:55	27	07:21 (LZ06)	20:29	18	06:48 (LZ02)	19:40		18:45			16:56	14	07:33 (LZ17)	16:32	35	09:07 (LZ16)	
6	05:33		06:55 (LZ06)	06:02		06:31 (LZ02)	06:37		07:12			06:51		07:21 (LZ17)	07:28		08:32 (LZ16)	
	20:54	25	07:20 (LZ06)	20:28	16	06:47 (LZ02)	19:38		18:43			16:55	9	07:30 (LZ17)	16:32	35	09:07 (LZ16)	
7	05:34		06:56 (LZ06)	06:03		06:32 (LZ02)	06:38		07:13			06:52			07:29		08:32 (LZ16)	
	20:54	22	07:18 (LZ06)	20:26	14	06:46 (LZ02)	19:36		18:42			16:54			16:32	36	09:08 (LZ16)	
8	05:35		06:58 (LZ06)	06:05		06:33 (LZ02)	06:40		07:14			06:53			07:30		08:33 (LZ16)	
	20:54	19	07:17 (LZ06)	20:25	11	06:44 (LZ02)	19:34		18:40			16:52			16:32	35	09:08 (LZ16)	
9	05:36		07:00 (LZ06)	06:06		06:36 (LZ02)	06:41		07:15			06:55			07:31		08:33 (LZ16)	
	20:53	16	07:16 (LZ06)	20:24	5	06:41 (LZ02)	19:33		18:38			16:51			16:32	36	09:09 (LZ16)	
10	05:36		07:02 (LZ06)	06:07			06:42		07:16			06:56			07:32		08:34 (LZ16)	
	20:53	11	07:13 (LZ06)	20:22			19:31		18:36			16:50			16:32	35	09:09 (LZ16)	
11	05:37			06:08			06:43		07:18			06:57			07:33		08:34 (LZ16)	
	20:52			20:21			19:29		18:35			16:49			16:32	36	09:10 (LZ16)	
12	05:38			06:09			06:44		07:19			06:59			07:33		08:35 (LZ16)	
	20:52			20:19			19:27		18:33			16:48			16:32	35	09:10 (LZ16)	
13	05:39			06:10			06:45		07:20			07:00			07:34		08:35 (LZ16)	
	20:51			20:18			19:25		18:31			16:47			16:32	36	09:11 (LZ16)	
14	05:39			06:11			06:46		07:21			07:01			07:35		08:35 (LZ16)	
	20:51			20:16			19:24		18:29			16:46			16:32	36	09:11 (LZ16)	
15	05:40			06:12			06:47		07:23			07:03			07:36		08:36 (LZ16)	
	20:50			20:15			19:22		18:28			16:45			16:32	35	09:11 (LZ16)	
16	05:41			06:14			06:49		07:24			07:04			07:37		08:36 (LZ16)	
	20:49			20:13			19:20		18:26			16:44			16:33	36	09:12 (LZ16)	
17	05:42			06:15			06:50		07:25			07:05			07:37		08:37 (LZ16)	
	20:49			20:12			19:18		18:24			16:43			16:33	36	09:13 (LZ16)	
18	05:43			06:16			06:51		07:26			07:07			07:38		08:37 (LZ16)	
	20:48			20:10			19:16		18:23			16:42			16:33	36	09:13 (LZ16)	
19	05:44		06:35 (LZ02)	06:17			06:52		07:28			07:08		08:38 (LZ16)	07:39		08:38 (LZ16)	
	20:47	7	06:42 (LZ02)	20:09			19:14		18:21			16:41	11	08:49 (LZ16)	16:34	36	09:14 (LZ16)	
20	05:45		06:34 (LZ02)	06:18			06:53		07:29			07:09		08:36 (LZ16)	07:39		08:38 (LZ16)	
	20:46	10	06:44 (LZ02)	20:07			19:12		18:19			16:40	16	08:52 (LZ16)	16:34	36	09:14 (LZ16)	
21	05:46		06:33 (LZ02)	06:19			06:54		07:30			07:10		08:35 (LZ16)	07:40		08:39 (LZ16)	
	20:45	13	06:46 (LZ02)	20:06			19:11		18:18			16:39	19	08:54 (LZ16)	16:34	36	09:15 (LZ16)	
22	05:47		06:31 (LZ02)	06:20			06:55		07:31		08:21 (LZ17)	07:12		08:33 (LZ16)	07:40		08:39 (LZ16)	
	20:45	15	06:46 (LZ02)	20:04			19:09		18:16	10	08:31 (LZ17)	16:39	22	08:55 (LZ16)	16:35	36	09:15 (LZ16)	
23	05:48		06:30 (LZ02)	06:21			06:57		07:33		08:19 (LZ17)	07:13		08:33 (LZ16)	07:41		08:40 (LZ16)	
	20:44	17	06:47 (LZ02)	20:02			19:07		18:15	15	08:34 (LZ17)	16:38	24	08:57 (LZ16)	16:35	36	09:16 (LZ16)	
24	05:49		06:30 (LZ02)	06:23			06:58		07:34		08:17 (LZ17)	07:14		08:32 (LZ16)	07:41		08:40 (LZ16)	
	20:43	18	06:48 (LZ02)	20:01			19:05		18:13	18	08:35 (LZ17)	16:37	26	08:58 (LZ16)	16:36	36	09:16 (LZ16)	
25	05:50		06:29 (LZ02)	06:24			06:59		06:35		07:16 (LZ17)	07:15		08:32 (LZ16)	07:42		08:41 (LZ16)	
	20:42	19	06:48 (LZ02)	19:59			19:03		17:12	19	07:35 (LZ17)	16:37	27	08:59 (LZ16)	16:37	36	09:17 (LZ16)	
26	05:51		06:29 (LZ02)	06:25			07:00		06:36		07:16 (LZ17)	07:17		08:32 (LZ16)	07:42		08:41 (LZ16)	
	20:41	20	06:49 (LZ02)	19:57			19:01		17:10	21	07:37 (LZ17)	16:36	29	09:01 (LZ16)	16:37	36	09:17 (LZ16)	
27	05:52		06:28 (LZ02)	06:26			07:01		06:38		07:15 (LZ17)	07:18		08:32 (LZ16)	07:42		08:41 (LZ16)	
	20:40	21	06:49 (LZ02)	19:56			19:00		17:09	22	07:37 (LZ17)	16:36	29	09:01 (LZ16)	16:38	36	09:17 (LZ16)	
28	05:53		06:28 (LZ02)	06:27			07:02		06:39		07:15 (LZ17)	07:19		08:31 (LZ16)	07:43		08:42 (LZ16)	
	20:39	21	06:49 (LZ02)	19:54			18:58		17:07	22	07:37 (LZ17)	16:35	31	09:02 (LZ16)	16:39	35	09:17 (LZ16)	
29	05:54		06:28 (LZ02)	06:28			07:03		06:40		07:14 (LZ17)	07:20		08:31 (LZ16)	07:43		08:42 (LZ16)	
	20:37	22	06:50 (LZ02)	19:52			18:56		17:06	23	07:37 (LZ17)	16:35	32	09:03 (LZ16)	16:39	36	09:18 (LZ16)	
30	05:55		06:28 (LZ02)	06:29			07:05		06:42		07:14 (LZ17)	07:21		08:32 (LZ16)	07:43		08:43 (LZ16)	
	20:36	22	06:50 (LZ02)	19:50			18:54		17:04	23	07:37 (LZ17)	16:34	32	09:04 (LZ16)	16:40	36	09:19 (LZ16)	
31	05:56		06:28 (LZ02)	06:31					06:43		07:15 (LZ17)				07:43		08:44 (LZ16)	
	20:35	22	06:50 (LZ02)	19:49					17:03	22	07:37 (LZ17)				16:41	35	09:19 (LZ16)	
Potential sun hours	468			434			376		342			291			278			
Total, worst case	471			147					195			398				1098		
Sun reduction	0.59			0.65					0.47			0.36				0.26		
Oper. time red.	1.00			1.00					1.00			1.00				1.00		
Wind dir. red.	0.59			0.58					0.65			0.66				0.66		
Total reduction	0.34			0.38					0.31			0.24				0.18		
Total, real	162			55					60			96				192		

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		





SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_06 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -94.2° Slope: 90.0° (37)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2.61 3.03 3.64 5.32 6.89 7.61 8.86 9.04 7.43 5.21 3.54 2.37

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
1,100 811 599 537 466 626 951 657 457 913 862 781 8,760

January		February		March		April		May		June	
1	07:44		07:28	08:33 (LZ16)	06:48		07:31 (LZ17)	06:53	06:03	05:31	
	16:42		17:19	09:09 (LZ16)	17:57	18	07:49 (LZ17)	19:35	20:11	20:44	
2	07:44		07:27	08:34 (LZ16)	06:46		07:33 (LZ17)	06:51	06:02	05:30	
	16:43		17:20	09:09 (LZ16)	17:58	13	07:46 (LZ17)	19:36	20:12	20:45	
3	07:44		07:25	08:33 (LZ16)	06:45		07:35 (LZ17)	06:49	06:00	05:30	
	16:44		17:22	09:08 (LZ16)	17:59	8	07:43 (LZ17)	19:38	20:13	20:46	
4	07:44	08:39 (LZ16)	07:24	08:34 (LZ16)	06:43			06:48	05:59	05:29	
	16:45	7	08:46 (LZ16)	17:23	34	09:08 (LZ16)	18:01	19:39	20:15	20:46	
5	07:44	08:37 (LZ16)	07:23	08:35 (LZ16)	06:41			06:46	05:57	05:29	
	16:46	11	08:48 (LZ16)	17:24	32	09:07 (LZ16)	18:02	19:40	20:16	20:47	
6	07:44	08:36 (LZ16)	07:22	08:37 (LZ16)	06:39			06:44	05:56	05:28	
	16:47	14	08:50 (LZ16)	17:26	30	09:07 (LZ16)	18:03	19:41	20:17	20:48	
7	07:44	08:35 (LZ16)	07:21	08:37 (LZ16)	06:38			06:42	05:55	05:28	
	16:48	17	08:52 (LZ16)	17:27	28	09:05 (LZ16)	18:04	19:42	20:18	20:48	
8	07:43	08:35 (LZ16)	07:19	08:39 (LZ16)	06:36			06:40	05:53	05:28	
	16:49	19	08:54 (LZ16)	17:29	25	09:04 (LZ16)	18:06	19:44	20:19	20:49	
9	07:43	08:34 (LZ16)	07:18	08:41 (LZ16)	06:34			06:39	05:52	05:28	
	16:50	20	08:54 (LZ16)	17:30	21	09:02 (LZ16)	18:07	19:45	20:20	20:50	
10	07:43	08:33 (LZ16)	07:17	08:42 (LZ16)	06:33			06:37	05:51	05:27	
	16:51	23	08:56 (LZ16)	17:31	17	08:59 (LZ16)	18:08	19:46	20:22	20:50	
11	07:43	08:33 (LZ16)	07:15	08:46 (LZ16)	06:31			06:35	05:50	05:27	
	16:52	25	08:58 (LZ16)	17:33	10	08:56 (LZ16)	18:10	19:47	20:23	20:51	
12	07:42	08:32 (LZ16)	07:14		06:29			06:33	05:49	05:27	
	16:53	26	08:58 (LZ16)	17:34	18:11			19:48	20:24	20:52	
13	07:42	08:32 (LZ16)	07:13		06:27			06:32	05:47	05:27	
	16:54	28	09:00 (LZ16)	17:35	18:12			19:50	20:25	20:52	
14	07:41	08:32 (LZ16)	07:11		06:25			06:30	05:46	05:27	
	16:56	28	09:00 (LZ16)	17:37	18:13			19:51	20:26	20:53	
15	07:41	08:32 (LZ16)	07:10		06:24			06:28	05:45	05:27	
	16:57	30	09:02 (LZ16)	17:38	18:15			19:52	20:27	20:53	
16	07:41	08:31 (LZ16)	07:08		06:22			06:27	05:44	05:27	
	16:58	31	09:02 (LZ16)	17:40	18:16			19:53	20:28	20:53	
17	07:40	08:31 (LZ16)	07:07		06:20			06:25	05:43	05:27	
	16:59	32	09:03 (LZ16)	17:41	11	07:46 (LZ17)	18:17	19:54	20:29	20:54	
18	07:39	08:31 (LZ16)	07:05		06:18			06:23	05:42	05:27	
	17:00	33	09:04 (LZ16)	17:42	15	07:49 (LZ17)	18:18	19:56	20:30	20:54	
19	07:39	08:31 (LZ16)	07:04		06:16			06:22	05:41	05:27	
	17:02	34	09:05 (LZ16)	17:44	18	07:50 (LZ17)	18:19	19:57	20:32	20:54	
20	07:38	08:30 (LZ16)	07:02		06:15			06:20	05:40	05:27	
	17:03	35	09:05 (LZ16)	17:45	20	07:51 (LZ17)	18:21	19:58	20:33	20:55	
21	07:37	08:31 (LZ16)	07:01		06:13			06:18	05:39	05:27	
	17:04	36	09:07 (LZ16)	17:46	22	07:52 (LZ17)	18:22	19:59	20:34	20:55	
22	07:37	08:31 (LZ16)	06:59		06:11			06:17	05:38	05:27	
	17:06	36	09:07 (LZ16)	17:48	23	07:52 (LZ17)	18:23	20:00	20:35	20:55	
23	07:36	08:31 (LZ16)	06:58		06:09			06:15	05:37	05:28	
	17:07	37	09:08 (LZ16)	17:49	23	07:52 (LZ17)	18:24	20:02	20:36	20:55	
24	07:35	08:31 (LZ16)	06:56		06:07			06:14	05:36	05:28	
	17:08	37	09:08 (LZ16)	17:50	23	07:52 (LZ17)	18:26	20:03	20:37	20:56	
25	07:34	08:31 (LZ16)	06:55		06:06			06:12	05:36	05:28	
	17:09	37	09:08 (LZ16)	17:52	22	07:51 (LZ17)	18:27	20:04	20:38	20:56	
26	07:33	08:31 (LZ16)	06:53		06:04			06:10	05:35	05:28	
	17:11	38	09:09 (LZ16)	17:53	23	07:52 (LZ17)	18:28	20:05	20:39	20:56	
27	07:33	08:31 (LZ16)	06:51		06:02			06:09	05:34	05:29	
	17:12	38	09:09 (LZ16)	17:54	22	07:51 (LZ17)	18:29	20:06	20:40	20:56	
28	07:32	08:31 (LZ16)	06:50		06:00			06:07	05:33	05:29	
	17:13	38	09:09 (LZ16)	17:55	19	07:49 (LZ17)	18:30	20:08	20:40	20:56	
29	07:31	08:31 (LZ16)			06:58			06:06	05:33	05:30	
	17:15	38	09:09 (LZ16)		19:32			20:09	20:41	20:56	
30	07:30	08:32 (LZ16)			06:57			06:04	05:32	05:30	
	17:16	37	09:09 (LZ16)		19:33			20:10	20:42	20:56	
31	07:29	08:32 (LZ16)			06:55				05:31		
	17:18	37	09:09 (LZ16)		19:34				20:43		
Potential sun hours	289		293		369			402	456	462	
Total, worst case	822		544		39						
Sun reduction	0.28		0.29		0.31						
Oper. time red.	1.00		1.00		1.00						
Wind dir. red.	0.67		0.65		0.63						
Total reduction	0.19		0.19		0.19						
Total, real	153		103		8						

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_06 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -94.2° Slope: 90.0° (37)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2.61 3.03 3.64 5.32 6.89 7.61 8.86 9.04 7.43 5.21 3.54 2.37

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
1,100 811 599 537 466 626 951 657 457 913 862 781 8,760

	July	August	September	October	November	December
1	05:31 20:56	05:57 20:34	06:32 19:47	07:06 18:52	06:44 17:01	08:12 (LZ16) 16:34
2	05:31 20:55	05:58 20:33	06:33 19:45	07:07 18:50	06:46 17:00	08:09 (LZ16) 16:33
3	05:32 20:55	05:59 20:32	06:34 19:43	07:08 18:49	06:47 16:59	08:08 (LZ16) 16:33
4	05:32 20:55	06:00 20:30	06:35 19:42	07:09 18:47	06:48 16:57	08:07 (LZ16) 16:33
5	05:33 20:55	06:01 20:29	06:36 19:40	07:11 18:45	06:50 16:56	08:06 (LZ16) 16:32
6	05:33 20:54	06:02 20:28	06:37 19:38	07:12 18:43	06:51 16:55	08:05 (LZ16) 16:32
7	05:34 20:54	06:03 20:26	06:38 19:36	07:13 18:42	06:52 16:54	08:04 (LZ16) 16:32
8	05:35 20:54	06:05 20:25	06:40 19:34	07:14 18:40	06:53 16:52	08:04 (LZ16) 16:32
9	05:36 20:53	06:06 20:24	06:41 19:33	07:15 18:38	06:55 16:51	08:03 (LZ16) 16:32
10	05:36 20:53	06:07 20:22	06:42 19:31	07:16 18:36	06:56 16:50	08:04 (LZ16) 16:32
11	05:37 20:52	06:08 20:21	06:43 19:29	07:18 18:35	08:08 (LZ17) 08:19 (LZ17)	06:57 16:49
12	05:38 20:52	06:09 20:19	06:44 19:27	07:19 18:33	08:05 (LZ17) 08:21 (LZ17)	06:59 16:48
13	05:39 20:51	06:10 20:18	06:45 19:25	07:20 18:31	08:04 (LZ17) 08:22 (LZ17)	07:00 16:47
14	05:39 20:51	06:11 20:16	06:46 19:24	07:21 18:29	08:03 (LZ17) 08:23 (LZ17)	07:01 16:46
15	05:40 20:50	06:12 20:15	06:47 19:22	07:23 18:28	08:02 (LZ17) 08:23 (LZ17)	07:03 16:45
16	05:41 20:49	06:14 20:13	06:49 19:20	07:24 18:26	08:01 (LZ17) 08:23 (LZ17)	07:04 16:44
17	05:42 20:49	06:15 20:12	06:50 19:18	07:25 18:24	08:01 (LZ17) 08:24 (LZ17)	07:05 16:43
18	05:43 20:48	06:16 20:10	06:51 19:16	07:26 18:23	08:00 (LZ17) 08:23 (LZ17)	07:07 16:42
19	05:44 20:47	06:17 20:09	06:52 19:14	07:28 18:21	08:00 (LZ17) 08:23 (LZ17)	07:08 16:41
20	05:45 20:46	06:18 20:07	06:53 19:12	07:29 18:19	08:01 (LZ17) 08:23 (LZ17)	07:09 16:40
21	05:46 20:45	06:19 20:06	06:54 19:11	07:30 18:18	08:01 (LZ17) 08:22 (LZ17)	07:10 16:39
22	05:47 20:44	06:20 20:04	06:55 19:09	07:31 18:16	08:01 (LZ17) 08:21 (LZ17)	07:12 16:39
23	05:48 20:44	06:22 20:02	06:57 19:07	07:33 18:15	08:03 (LZ17) 08:20 (LZ17)	07:13 16:38
24	05:49 20:43	06:23 20:01	06:58 19:05	07:34 18:13	08:04 (LZ17) 08:18 (LZ17)	07:14 16:37
25	05:50 20:42	06:24 19:59	06:59 19:03	07:35 17:12	08:09 (LZ16) 07:15 (LZ17)	07:15 16:37
26	05:51 20:41	06:25 19:57	07:00 19:01	07:36 17:10	07:17 16:36	08:10 (LZ16) 16:37
27	05:52 20:40	06:26 19:56	07:01 19:00	07:38 17:09	07:18 16:36	08:11 (LZ16) 16:38
28	05:53 20:39	06:27 19:54	07:02 18:58	07:39 17:07	07:19 16:35	08:12 (LZ16) 16:39
29	05:54 20:37	06:28 19:52	07:03 18:56	07:40 17:06	07:20 16:35	08:12 (LZ16) 16:39
30	05:55 20:36	06:29 19:50	07:05 18:54	07:42 17:04	07:21 16:34	08:13 (LZ16) 16:40
31	05:56 20:35	06:31 19:49	07:06 17:03	07:43 17:03	08:15 (LZ16) 08:27 (LZ16)	07:43 16:41
Potential sun hours	468	434	376	342	291	278
Total, worst case				292	982	137
Sun reduction				0.47	0.36	0.26
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.67	0.67
Total reduction				0.30	0.24	0.18
Total, real				87	238	24

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_07 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -65.3° Slope: 90.0° (38)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January		February		March		April		May		June		July		August		September		October		November		December	
1	07:44		07:28		08:18 (LZ16)	06:48		07:22 (LZ17)	06:53	06:03	05:31	05:31	05:57	06:32	07:06				07:06		06:44		07:47 (LZ16)	07:22
	16:42		17:19	33	08:51 (LZ16)	17:57	22	07:44 (LZ17)	19:35	20:11	20:44	20:56	20:34	19:47	18:52				18:52	17:01	35	08:22 (LZ16)	16:34	
2	07:44		07:27		08:18 (LZ16)	06:46		07:21 (LZ17)	06:51	06:02	05:30	05:31	05:58	06:33	07:07				07:07	06:46		07:46 (LZ16)	07:24	
	16:43		17:20	34	08:52 (LZ16)	17:58	22	07:43 (LZ17)	19:36	20:12	20:45	20:55	20:33	19:45	18:50				18:50	17:00	36	08:22 (LZ16)	16:33	
3	07:44		07:25		08:17 (LZ16)	06:45		07:21 (LZ17)	06:49	06:00	05:30	05:32	05:59	06:34	07:08				07:08	06:47		07:47 (LZ16)	07:25	
	16:44		07:24	34	08:51 (LZ16)	06:43	21	07:42 (LZ17)	06:48	05:59	20:39	20:46	20:55	20:32	19:43				19:43	16:59	36	08:23 (LZ16)	16:32	
	16:45		17:23	35	08:52 (LZ16)	18:01	20	07:42 (LZ17)	19:39	20:15	20:46	20:55	20:30	19:42	18:47				18:47	16:57	35	08:22 (LZ16)	16:33	
5	07:44		07:23		08:17 (LZ16)	06:41		07:23 (LZ17)	06:46	05:57	05:29	05:33	06:01	06:36	07:11				07:11	06:50		07:47 (LZ16)	07:27	
	16:46		17:24	36	08:53 (LZ16)	18:02	18	07:41 (LZ17)	19:40	20:16	20:47	20:55	20:29	19:40	18:45				18:45	16:56	36	08:23 (LZ16)	16:33	
6	07:44		07:22		08:17 (LZ16)	06:40		07:24 (LZ17)	06:44	05:56	05:29	05:33	06:02	06:37	07:12			08:04 (LZ17)	07:12		06:51		07:47 (LZ16)	07:28
	16:47		17:26	36	08:53 (LZ16)	18:03	15	07:39 (LZ17)	19:41	20:17	20:48	20:54	20:28	19:38	18:43			7	08:01 (LZ17)	16:55	36	08:23 (LZ16)	16:32	
7	07:44		07:21		08:17 (LZ16)	06:38		07:25 (LZ17)	06:42	05:55	05:28	05:34	06:04	06:38	07:13				08:00 (LZ17)	06:52		07:48 (LZ16)	07:29	
	16:48		17:27	36	08:53 (LZ16)	18:04	11	07:36 (LZ17)	19:42	20:18	20:48	20:54	20:26	19:36	18:42			14	08:14 (LZ17)	16:54	35	08:23 (LZ16)	16:32	
8	07:43		07:19		08:17 (LZ16)	06:36		06:40	05:53	05:28	05:35	06:05	06:40	07:14	07:58 (LZ17)				07:14			07:48 (LZ16)	07:30	
	16:49		17:29	36	08:53 (LZ16)	18:05		19:44	20:19	20:49	20:54	20:25	19:34	18:40	17			17	08:15 (LZ17)	16:52	34	08:22 (LZ16)	16:32	
9	07:43		07:18		08:18 (LZ16)	06:34		06:39	05:52	05:28	05:36	06:06	06:41	07:15	07:58 (LZ17)				07:15			07:48 (LZ16)	07:31	
	16:50		17:30	35	08:53 (LZ16)	18:07		19:45	20:20	20:50	20:53	20:24	19:33	18:38	18				08:16 (LZ17)	16:51	34	08:22 (LZ16)	16:32	
10	07:43		07:17		08:17 (LZ16)	06:33		06:37	05:51	05:27	05:36	06:07	06:42	07:17	07:56 (LZ17)				07:17			07:49 (LZ16)	07:32	
	16:51		17:31	35	08:52 (LZ16)	18:08		19:46	20:22	20:50	20:53	20:22	19:31	18:36	21				08:17 (LZ17)	16:50	33	08:22 (LZ16)	16:32	
11	07:43		07:15		08:18 (LZ16)	06:31		06:35	05:50	05:27	05:37	06:08	06:43	07:18	07:55 (LZ17)				07:18			07:50 (LZ16)	07:33	
	16:52		17:33	34	08:52 (LZ16)	18:10		19:47	20:23	20:51	20:52	20:21	19:29	18:35	22				08:17 (LZ17)	16:49	31	08:21 (LZ16)	16:32	
12	07:42		07:14		08:19 (LZ16)	06:29		06:33	05:49	05:27	05:38	06:09	06:44	07:19	07:55 (LZ17)				07:19			07:51 (LZ16)	07:33	
	16:53		17:34	33	08:52 (LZ16)	18:11		19:48	20:24	20:52	20:52	20:19	19:27	18:33	21				08:16 (LZ17)	16:48	30	08:21 (LZ16)	16:32	
13	07:42		07:13		08:19 (LZ16)	06:27		06:32	05:47	05:27	05:39	06:10	06:45	07:20	07:55 (LZ17)				07:20			07:52 (LZ16)	07:34	
	16:54		17:35	32	08:51 (LZ16)	18:12		19:50	20:25	20:52	20:52	20:18	19:25	18:31	22				08:17 (LZ17)	16:47	28	08:20 (LZ16)	16:31	
14	07:41		07:11		08:20 (LZ16)	06:25		06:30	05:46	05:27	05:39	06:11	06:46	07:21	07:55 (LZ17)				07:21			07:53 (LZ16)	07:35	
	16:56		17:37	31	08:51 (LZ16)	18:13		19:51	20:26	20:53	20:51	20:16	19:24	18:29	21				08:16 (LZ17)	16:46	26	08:19 (LZ16)	16:32	
15	07:41		07:10		08:21 (LZ16)	06:24		06:28	05:45	05:27	05:40	06:12	06:47	07:23	07:54 (LZ17)				07:23			07:55 (LZ16)	07:36	
	16:57		17:38	28	08:49 (LZ16)	18:15		19:52	20:27	20:53	20:50	20:15	19:22	18:28	22				08:16 (LZ17)	16:45	23	08:18 (LZ16)	16:32	
16	07:41		07:08		08:22 (LZ16)	06:22		06:27	05:44	05:27	05:41	06:14	06:49	07:24	07:55 (LZ17)				07:24			07:56 (LZ16)	07:37	
	16:58		17:40	26	08:48 (LZ16)	18:16		19:53	20:28	20:53	20:49	20:13	19:20	18:26	19				08:14 (LZ17)	16:44	21	08:17 (LZ16)	16:33	
17	07:40		07:07		08:23 (LZ16)	06:20		06:25	05:43	05:27	05:42	06:15	06:50	07:25	07:56 (LZ17)				07:25			07:58 (LZ16)	07:37	
	16:59		17:41	23	08:46 (LZ16)	18:17		19:54	20:29	20:54	20:49	20:12	19:18	18:24	18				08:14 (LZ17)	16:43	18	08:16 (LZ16)	16:33	
18	07:39		07:05		08:25 (LZ16)	06:18		06:23	05:42	05:27	05:43	06:16	06:51	07:26	07:57 (LZ17)				07:26			08:00 (LZ16)	07:38	
	17:00		17:42	20	08:45 (LZ16)	18:18		19:56	20:30	20:54	20:48	20:10	19:16	18:23	15				08:12 (LZ17)	16:42	14	08:14 (LZ16)	16:33	
19	07:39		07:04		08:28 (LZ16)	06:16		06:22	05:41	05:27	05:44	06:17	06:52	07:28	07:58 (LZ17)				07:28			08:03 (LZ16)	07:39	
	17:02		17:44	14	08:42 (LZ16)	18:19		19:57	20:32	20:54	20:47	20:09	19:14	18:21	12				08:10 (LZ17)	16:41	7	08:10 (LZ16)	16:34	
20	07:38		07:02		08:34 (LZ16)	06:15		06:20	05:40	05:27	05:45	06:18	06:53	07:29	08:02 (LZ17)				07:29			07:59	07:39	
	17:03		17:45	2	08:36 (LZ16)	18:21		19:58	20:33	20:55	20:46	20:07	19:12	18:19	5				08:07 (LZ17)	16:40			16:34	
21	07:37		07:01			06:13		06:18	05:39	05:27	05:46	06:19	06:54	07:30								07:10	07:40	
	17:04		17:46			18:22		19:59	20:34	20:55	20:45	20:06	19:11	18:18								16:40	16:34	
22	07:37		06:59		07:29 (LZ17)	06:11		06:17	05:38	05:27	05:47	06:20	06:55	07:31					09:01 (LZ16)	17:12			07:40	
	17:06		17:48	8	07:37 (LZ17)	18:23		20:00	20:35	20:55	20:45	20:04	19:09	18:16	8				09:09 (LZ16)	17:16			16:35	
23	07:36		08:29 (LZ16)		07:27 (LZ17)	06:09		06:15	05:37	05:28	05:48	06:22	06:57	07:33					08:57 (LZ16)	17:13			07:41	
	17:07	7	08:36 (LZ16)		17:49	13		20:02	20:36	20:55	20:44	20:02	19:07	18:15	16				09:13 (LZ16)	16:38			16:35	
24	07:35		08:26 (LZ16)		07:25 (LZ17)	06:04		06:14	05:36	05:28	05:49	06:23	06:58	07:34					08:54 (LZ16)	17:14			16:31	
	17:08	14	08:40 (LZ16)		17:50	16		20:03	20:37	20:56	20:43	20:01	19:05	18:13	21				09:15 (LZ16)	16:37			16:36	
25	07:34		08:24 (LZ16)		06:55	07:24 (LZ17)		06:12	05:36	05:28	05:50	06:24	06:59	06:35					07:52 (LZ16)	17:15			07:42	
	17:09	18	08:42 (LZ16)		17:52	19		20:04	20:38	20:56	20:42	19:59	19:03	17:12	24				08:16 (LZ16)	16:37			16:37	
26	07:33		08:23 (LZ16)		06:53	07:23 (LZ17)		06:10	05:35	05:28	05:51	06:25	07:00	06:36					07:52 (LZ16)	17:17			07:42	
	17:11	21	08:44 (LZ16)		17:53	20		20:05	20:39	20:56	20:41	19:57	19:01	17:10	26				08:18 (LZ16)	16:36			16:37	
27	07:33		08:22 (LZ16)		06:51	07:22 (LZ17)		06:09	05:34	05:29	05:52	06:26	07:01	06:38					07:50 (LZ16)	17:18			16:42	
	17:12	23	08:45 (LZ16)		17:54	21		20:06	20:40	20:56	20:40	19:56	19:00	17:09	29				07:50 (LZ16)	17:16			16:38	
28	07:32		08:21 (LZ16)		06:50	07:21 (LZ17)		06:07	05:32	05:27	05:53	06:27	07:02	06:39					07:50 (LZ16)	17:17			16:39	
	17:14	26	08:47 (LZ16)		17:55	22		20:08	20:40	20:56	20:39	19:54	18:58	17:07	31				08:21 (LZ16)	16:36				



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_08 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 79.3° Slope: 90.0° (39)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2.61 3.03 3.64 5.32 6.89 7.61 8.86 9.04 7.43 5.21 3.54 2.37

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
1,100 811 599 537 466 626 951 657 457 913 862 781 8,760

	January	February	March	April	May	June
1	07:44 16:42	07:28 17:19	06:48 17:57	06:53 19:35	06:03 20:11	05:31 20:44
2	07:44 16:43	07:27 17:20	06:46 17:58	06:51 19:36	06:02 20:12	05:30 20:45
3	07:44 16:44	07:25 17:22	06:45 17:59	06:49 19:38	07:15 (LZ06) 07:25 (LZ06)	06:00 20:14
4	07:44 16:45	07:24 17:23	06:43 18:01	06:48 19:39	07:12 (LZ06) 07:27 (LZ06)	05:59 20:15
5	07:44 16:46	07:23 17:25	06:41 18:02	06:46 19:40	07:10 (LZ06) 07:28 (LZ06)	05:57 20:16
6	07:44 16:47	07:22 17:26	06:40 18:03	06:44 19:41	07:09 (LZ06) 07:29 (LZ06)	05:56 20:17
7	07:44 16:48	07:21 17:27	06:38 18:05	06:42 19:42	07:07 (LZ06) 07:29 (LZ06)	05:55 20:18
8	07:43 16:49	07:19 17:29	06:36 18:06	06:40 19:44	07:07 (LZ06) 07:30 (LZ06)	05:54 20:19
9	07:43 16:50	07:18 17:30	06:34 18:07	06:39 17:34 (LZ07)	07:06 (LZ06) 07:30 (LZ06)	05:52 20:21
10	07:43 16:51	07:17 17:31	06:33 18:08	06:37 17:30 (LZ07)	07:06 (LZ06) 07:29 (LZ06)	05:51 20:22
11	07:43 16:52	07:16 17:33	06:31 18:10	06:35 17:28 (LZ07)	07:06 (LZ06) 07:29 (LZ06)	05:50 20:23
12	07:42 16:53	07:14 17:34	06:29 18:11	06:34 17:27 (LZ07)	07:06 (LZ06) 07:28 (LZ06)	05:49 20:24
13	07:42 16:54	07:13 17:35	06:27 18:12	06:32 17:26 (LZ07)	07:06 (LZ06) 07:27 (LZ06)	05:47 20:25
14	07:42 16:56	07:11 17:37	06:25 18:13	06:30 17:25 (LZ07)	07:06 (LZ06) 07:26 (LZ06)	05:46 20:26
15	07:41 16:57	07:10 17:38	06:24 18:15	06:28 17:24 (LZ07)	07:08 (LZ06) 07:25 (LZ06)	05:45 20:27
16	07:41 16:58	07:08 17:40	06:22 18:16	06:27 17:24 (LZ07)	07:08 (LZ06) 07:23 (LZ06)	05:44 20:28
17	07:40 16:59	07:07 17:41	06:20 18:17	06:25 17:24 (LZ07)	07:10 (LZ06) 07:20 (LZ06)	05:43 20:29
18	07:39 17:00	07:06 17:42	06:18 18:18	06:23 17:25 (LZ07)	05:42 20:31	05:27 20:54
19	07:39 17:02	07:04 17:44	06:16 18:19	06:22 17:25 (LZ07)	05:41 20:32	05:27 20:55
20	07:38 17:03	07:03 17:45	06:15 18:21	06:20 17:43 (LZ07)	05:40 20:33	05:27 20:55
21	07:38 17:04	07:01 17:46	06:13 18:22	06:18 17:27 (LZ07)	05:39 20:34	05:27 20:55
22	07:37 17:06	06:59 17:48	06:11 18:23	06:17 17:28 (LZ07)	05:38 20:35	05:27 20:55
23	07:36 17:07	06:58 17:49	06:09 18:24	06:15 20:02	05:37 20:36	05:28 20:55
24	07:35 17:08	06:56 17:50	06:07 18:26	06:14 20:03	05:36 20:37	05:28 20:56
25	07:34 17:10	06:55 17:52	06:06 18:27	06:12 20:04	05:36 20:38	05:28 20:56
26	07:34 17:11	06:53 17:53	06:04 18:28	06:11 20:05	05:35 20:39	05:28 20:56
27	07:33 17:12	06:51 17:54	06:02 18:29	06:09 20:06	05:34 20:40	05:29 20:56
28	07:32 17:14	06:50 17:56	06:00 18:30	06:07 20:08	05:33 20:41	05:29 20:56
29	07:31 17:15		06:58 19:32	06:06 20:09	05:33 20:41	05:30 20:56
30	07:30 17:16		06:57 19:33	06:05 20:10	05:32 20:42	05:30 20:56
31	07:29 17:18		06:55 19:34		05:31 20:43	
Potential sun hours	289	293	369	402	456	462
Total, worst case			242	283		
Sun reduction			0.31	0.40		
Oper. time red.			1.00	1.00		
Wind dir. red.			0.59	0.60		
Total reduction			0.18	0.24		
Total, real			43	67		

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_08 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 79.3° Slope: 90.0° (39)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2.61 3.03 3.64 5.32 6.89 7.61 8.86 9.04 7.43 5.21 3.54 2.37

Operational time
N NNE ENE E SSE S SSW WSW W WNW NNW Sum
1,100 811 599 537 466 626 951 657 457 913 862 781 8,760

	July	August	September	October	November	December
1	05:31 20:56	05:57 20:34	06:32 19:47	07:05 (LZ06) 19:47	07:06 18:06 (LZ07)	06:44 17:01
2	05:31 20:55	05:58 20:33	06:33 19:45	07:05 (LZ06) 19:45	07:07 18:06 (LZ07)	06:46 17:00
3	05:32 20:55	05:59 20:32	06:34 19:44	07:04 (LZ06) 19:44	07:08 18:07 (LZ07)	06:47 16:59
4	05:32 20:55	06:00 20:30	06:35 19:42	07:04 (LZ06) 19:42	07:09 18:10 (LZ07)	06:48 16:57
5	05:33 20:55	06:01 20:29	06:36 19:40	07:04 (LZ06) 19:40	07:11 18:20 (LZ07)	06:50 16:57
6	05:33 20:54	06:02 20:28	06:37 19:38	07:05 (LZ06) 19:38	07:12 18:25 (LZ07)	06:51 16:57
7	05:34 20:54	06:04 20:26	06:39 19:36	07:05 (LZ06) 19:36	07:13 18:26 (LZ07)	06:52 16:54
8	05:35 20:54	06:05 20:25	06:40 19:35	07:06 (LZ06) 19:35	07:14 18:27 (LZ07)	06:54 16:52
9	05:36 20:53	06:06 20:24	06:41 19:33	07:08 (LZ06) 19:33	07:15 18:28 (LZ07)	06:55 16:51
10	05:36 20:53	06:07 20:22	06:42 19:31	07:19 (LZ06) 19:31	18:38 18:36	16:51 16:50
11	05:37 20:52	06:08 20:21	06:43 19:29	07:18 19:29	18:35 18:35	16:50 16:49
12	05:38 20:52	06:09 20:19	06:44 19:27	07:19 19:27	18:34 18:33	16:50 16:48
13	05:39 20:51	06:10 20:18	06:45 19:25	07:20 19:25	18:33 18:31	16:49 16:47
14	05:39 20:51	06:11 20:17	06:46 19:24	07:21 19:24	18:32 18:29	16:48 16:46
15	05:40 20:50	06:13 20:15	06:48 19:22	07:23 19:22	18:30 18:28	16:46 16:45
16	05:41 20:49	06:14 20:14	06:49 19:20	07:24 19:20	18:29 18:26	16:45 16:44
17	05:42 20:49	06:15 20:12	06:50 19:18	07:25 19:18	18:28 18:24	16:44 16:43
18	05:43 20:48	06:16 20:10	06:51 19:16	07:26 19:16	18:27 18:23	16:43 16:42
19	05:44 20:47	06:17 20:09	06:52 19:14	07:28 19:14	18:26 18:21	16:42 16:41
20	05:45 20:46	06:18 20:07	06:53 19:13	07:29 19:13	18:25 18:19	16:41 16:40
21	05:46 20:45	06:19 20:06	06:54 19:11	18:16 (LZ07) 19:11	07:30 18:23 (LZ07)	16:40 16:34
22	05:47 20:45	06:20 20:04	06:55 19:09	18:12 (LZ07) 19:09	07:31 18:26 (LZ07)	16:39 16:35
23	05:48 20:44	06:22 20:02	06:57 19:07	18:10 (LZ07) 19:07	07:33 18:27 (LZ07)	16:39 16:38
24	05:49 20:43	06:23 20:01	06:58 19:05	18:09 (LZ07) 19:05	07:34 18:27 (LZ07)	16:38 16:37
25	05:50 20:42	06:24 19:59	06:59 19:03	18:07 (LZ07) 19:03	07:35 18:28 (LZ07)	16:37 16:37
26	05:51 20:41	06:25 19:57	07:00 19:01	18:06 (LZ07) 19:01	07:36 18:28 (LZ07)	16:37 16:36
27	05:52 20:40	06:26 19:56	07:01 19:00	18:06 (LZ07) 19:00	07:38 18:27 (LZ07)	16:37 16:36
28	05:53 20:39	06:27 19:54	07:02 18:58	18:06 (LZ07) 18:58	07:39 18:28 (LZ07)	16:36 16:35
29	05:54 20:38	06:28 19:52	07:03 18:56	18:06 (LZ07) 18:56	07:40 18:27 (LZ07)	16:35 16:35
30	05:55 20:36	06:29 19:51	07:04 18:54	18:06 (LZ07) 18:54	07:42 18:26 (LZ07)	16:35 16:40
31	05:56 20:35	06:31 19:49	07:06 18:54	18:06 (LZ07) 19:49	07:43 17:04	16:35 16:40
Potential sun hours	468	434	376	342	291	278
Total, worst case		110	362	62		10
Sun reduction		0.65	0.59	0.47		0.26
Oper. time red.		1.00	1.00	1.00		1.00
Wind dir. red.		0.60	0.59	0.59		0.61
Total reduction		0.39	0.35	0.28		0.16
Total, real		43	127	17		2

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_09 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 77.7° Slope: 90.0° (40)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2.61 3.03 3.64 5.32 6.89 7.61 8.86 9.04 7.43 5.21 3.54 2.37

Operational time
N NNE ENE E SSE S SSW WSW W WNW NNW Sum
1,100 811 599 537 466 626 951 657 457 913 862 781 8,760

January			February			March			April			May			June		
1	07:44		15:26 (LZ15)	07:28	06:48				06:53			06:03		05:31			
	16:42	25	15:51 (LZ15)	17:19	17:57				19:35			20:11		20:44			
2	07:44		15:27 (LZ15)	07:27	06:46				06:51			06:02		05:30			
	16:43	24	15:51 (LZ15)	17:20	17:58				19:36			20:12		20:45			
3	07:44		15:28 (LZ15)	07:25	06:45				06:49			06:00		05:30			
	16:44	24	15:52 (LZ15)	17:22	17:59				19:38			20:14		20:46			
4	07:44		15:28 (LZ15)	07:24	06:43				06:48			05:59		05:29			
	16:45	24	15:52 (LZ15)	17:23	18:01				19:39			20:15		20:46			
5	07:44		15:28 (LZ15)	07:23	06:41				06:46			05:57		05:29			
	16:46	23	15:51 (LZ15)	17:25	18:02				19:40			20:16		20:47			
6	07:44		15:29 (LZ15)	07:22	06:40				06:44			05:56		05:29			
	16:47	22	15:51 (LZ15)	17:26	18:03				19:41			20:17		20:48			
7	07:44		15:31 (LZ15)	07:21	06:38				06:42			05:55		05:28			
	16:48	21	15:52 (LZ15)	17:27	18:05				19:42			20:18		20:49			
8	07:43		15:32 (LZ15)	07:19	06:36				06:40			05:54		05:28			
	16:49	20	15:52 (LZ15)	17:29	18:06				19:44			20:19		20:49			
9	07:43		15:32 (LZ15)	07:18	06:34				06:39			05:52		05:28			
	16:50	19	15:51 (LZ15)	17:30	18:07				19:45			20:21		20:50			
10	07:43		15:34 (LZ15)	07:17	06:33				06:37			05:51		05:27			
	16:51	17	15:51 (LZ15)	17:31	18:08				19:46	11	07:02 (LZ06)	20:22		20:50			
11	07:43		15:35 (LZ15)	07:16	06:31				06:35			05:50		05:27			
	16:52	16	15:51 (LZ15)	17:33	18:10				19:47	15	07:15 (LZ06)	20:23		20:51			
12	07:42		15:36 (LZ15)	07:14	06:29				06:34			05:49		05:27			
	16:53	13	15:49 (LZ15)	17:34	18:11				19:48	18	07:16 (LZ06)	20:24		20:52			
13	07:42		15:39 (LZ15)	07:13	06:27				06:32			05:47		05:27			
	16:54	10	15:49 (LZ15)	17:35	18:12				19:50	21	07:17 (LZ06)	20:25		20:52			
14	07:42		15:42 (LZ15)	07:11	06:25				06:30			05:46		05:27			
	16:56	4	15:46 (LZ15)	17:37	18:13				19:51	22	07:17 (LZ06)	20:26		20:53			
15	07:41			07:10	06:24			17:42 (LZ07)	06:28			05:45		05:27			
	16:57			17:38	18:15	6		17:48 (LZ07)	19:52	23	07:18 (LZ06)	20:27		20:53			
16	07:41			07:08	06:22			17:39 (LZ07)	06:27			05:44		05:27			
	16:58			17:40	18:16	12		17:51 (LZ07)	19:53	24	07:18 (LZ06)	20:28		20:53			
17	07:40			07:07	06:20			17:36 (LZ07)	06:25			05:43		05:27			
	16:59			17:41	18:17	16		17:52 (LZ07)	19:54	24	07:17 (LZ06)	20:29		20:54			
18	07:39			07:06	06:18			17:36 (LZ07)	06:23			05:42		05:27			
	17:00			17:42	18:18	18		17:54 (LZ07)	19:56	23	07:17 (LZ06)	20:31		20:54			
19	07:39			07:04	06:16			17:34 (LZ07)	06:22			05:41		05:27			
	17:02			17:44	18:19	20		17:54 (LZ07)	19:57	23	07:16 (LZ06)	20:32		20:55			
20	07:38			07:03	06:15			17:33 (LZ07)	06:20			05:40		05:27			
	17:03			17:45	18:21	22		17:55 (LZ07)	19:58	22	07:16 (LZ06)	20:33		20:55			
21	07:38			07:01	06:13			17:33 (LZ07)	06:18			05:39		05:27			
	17:04			17:46	18:22	21		17:54 (LZ07)	19:59	21	07:15 (LZ06)	20:34		20:55			
22	07:37			06:59	06:11			17:32 (LZ07)	06:17			05:38		05:27			
	17:06			17:48	18:23	22		17:54 (LZ07)	20:00	20	07:15 (LZ06)	20:35		20:55			
23	07:36			06:58	06:09			17:33 (LZ07)	06:15			05:37		05:28			
	17:07			17:49	18:24	21		17:54 (LZ07)	20:02	17	07:13 (LZ06)	20:36		20:55			
24	07:35			06:56	06:07			17:33 (LZ07)	06:14			05:36		05:28			
	17:08			17:50	18:26	20		17:53 (LZ07)	20:03	14	07:11 (LZ06)	20:37		20:56			
25	07:34			06:55	06:06			17:33 (LZ07)	06:12			05:36		05:28			
	17:10			17:52	18:27	19		17:52 (LZ07)	20:04	10	07:09 (LZ06)	20:38		20:56			
26	07:34			06:53	06:04			17:34 (LZ07)	06:11			05:35		05:28			
	17:11			17:53	18:28	17		17:51 (LZ07)	20:05			20:39		20:56			
27	07:33			06:51	06:02			17:35 (LZ07)	06:09			05:34		05:29			
	17:12			17:54	18:29	14		17:49 (LZ07)	20:06			20:40		20:56			
28	07:32			06:50	06:00			17:37 (LZ07)	06:07			05:33		05:29			
	17:14			17:56	18:30	9		17:46 (LZ07)	20:08			20:41		20:56			
29	07:31				06:58				06:06			05:33		05:30			
	17:15				19:32				20:09			20:41		20:56			
30	07:30				06:57				06:05			05:32		05:30			
	17:16				19:33				20:10			20:42		20:56			
31	07:29				06:55							05:31					
	17:18				19:34							20:43					
Potential sun hours	289			293	369			402				456		462			
Total, worst case		262			237			308									
Sun reduction		0.28			0.31			0.40									
Oper. time red.		1.00			1.00			1.00									
Wind dir. red.		0.60			0.60			0.59									
Total reduction		0.17			0.18			0.23									
Total, real		44			43			72									

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_09 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 77.7° Slope: 90.0° (40)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:56	05:57 20:34	06:32 19:47	06:59 (LZ06) 07:14 (LZ06)	07:06 18:52	06:44 17:01
2	05:31 20:55	05:58 20:33	06:33 19:45	07:01 (LZ06) 07:12 (LZ06)	07:07 18:51	06:46 17:00
3	05:32 20:55	05:59 20:32	06:34 19:44		07:08 18:49	06:47 16:59
4	05:32 20:55	06:00 20:30	06:35 19:42		07:09 18:47	06:48 16:57
5	05:33 20:55	06:01 20:29	06:36 19:40		07:11 18:45	06:50 16:56
6	05:33 20:54	06:02 20:28	06:37 19:38		07:12 18:43	06:51 16:55
7	05:34 20:54	06:04 20:26	06:39 19:36		07:13 18:42	06:52 16:54
8	05:35 20:54	06:05 20:25	06:40 19:35		07:14 18:40	06:54 16:52
9	05:36 20:53	06:06 20:24	06:41 19:33		07:15 18:38	06:55 16:51
10	05:36 20:53	06:07 20:22	06:42 19:31		07:17 18:36	06:56 16:50
11	05:37 20:52	06:08 20:21	06:43 19:29		07:18 18:35	06:57 16:49
12	05:38 20:52	06:09 20:19	06:44 19:27		07:19 18:33	06:59 16:48
13	05:39 20:51	06:10 20:18	06:45 19:25		07:20 18:31	07:00 16:47
14	05:39 20:51	06:11 20:17	06:46 19:24		07:21 18:29	07:01 16:46
15	05:40 20:50	06:13 20:15	06:48 19:22	18:28 (LZ07)	07:23 18:28	07:03 16:45
16	05:41 20:49	06:14 20:14	06:49 19:20	7 18:35 (LZ07)	07:24 18:26	07:04 16:44
17	05:42 20:49	06:15 20:12	06:50 19:18	13 18:37 (LZ07)	07:25 18:24	07:05 16:43
18	05:43 20:48	06:16 20:10	06:51 19:16	17 18:39 (LZ07)	07:26 18:23	07:07 16:42
19	05:44 20:47	06:17 20:09	06:52 19:14	18 18:39 (LZ07)	07:28 18:21	07:08 16:41
20	05:45 20:46	06:18 20:07	06:53 19:13	20 18:39 (LZ07)	07:29 18:19	07:09 16:40
21	05:46 20:45	06:19 20:06	06:54 19:11	21 18:39 (LZ07)	07:30 18:18	07:10 16:40
22	05:47 20:45	06:20 20:04	06:55 19:09	21 18:40 (LZ07)	07:31 18:16	07:12 16:39
23	05:48 20:44	06:22 20:02	06:57 19:07	22 18:40 (LZ07)	07:33 18:15	07:13 16:38
24	05:49 20:43	06:23 20:01	06:58 19:05	21 18:39 (LZ07)	07:34 18:13	07:14 16:37
25	05:50 20:42	06:24 19:59	06:59 19:03	20 18:38 (LZ07)	07:35 18:12	07:15 16:37
26	05:51 20:41	06:25 19:57	06:56 19:01	19 18:37 (LZ07)	07:37 18:10	07:17 16:36
27	05:52 20:40	06:26 19:56	06:56 19:00	17 18:35 (LZ07)	07:38 18:09	07:18 16:36
28	05:53 20:39	06:27 19:54	06:56 18:58	14 18:33 (LZ07)	07:39 18:07	07:19 16:35
29	05:54 20:38	06:28 19:52	06:56 18:56	9 18:31 (LZ07)	07:40 18:06	07:20 16:35
30	05:55 20:36	06:29 19:51	06:56 18:54		07:41 18:04	07:21 16:34
31	05:56 20:35	06:31 19:49	06:58 18:54		07:42 18:03	07:22 16:34
Potential sun hours	468	434	376		291	278
Total, worst case		284	265		25	758
Sun reduction		0.65	0.59		0.36	0.26
Oper. time red.		1.00	1.00		1.00	1.00
Wind dir. red.		0.59	0.60		0.60	0.60
Total reduction		0.38	0.35		0.22	0.16
Total, real		108	94		5	121

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_10 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 83.7° Slope: 90.0° (41)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

January			February March			April			May			June		
1	07:44		15:27 (LZ15)	07:28	06:48		06:53		18:41 (LZ07)	06:03		05:31		
	16:42	29	15:56 (LZ15)	17:19	17:57		19:35		18:49 (LZ07)	20:11		20:44		
2	07:44		15:28 (LZ15)	07:27	06:46		06:51			06:02		05:30		
	16:43	28	15:56 (LZ15)	17:20	17:58		19:36			20:12		20:45		
3	07:44		15:28 (LZ15)	07:25	06:45		06:49			06:00		05:30		
	16:44	28	15:56 (LZ15)	17:22	17:59		19:38			20:14		20:46		
4	07:44		15:29 (LZ15)	07:24	06:43		06:48			05:59		05:29		
	16:45	28	15:57 (LZ15)	17:23	18:01		19:39			20:15		20:46		
5	07:44		15:29 (LZ15)	07:23	06:41		06:46			05:57		05:29		
	16:46	27	15:56 (LZ15)	17:25	18:02		19:40			20:16		20:47		
6	07:44		15:29 (LZ15)	07:22	06:40		06:44			05:56		05:29		
	16:47	28	15:57 (LZ15)	17:26	18:03		19:41			20:17		20:48		
7	07:44		15:30 (LZ15)	07:21	06:38		06:42			05:55		05:28		
	16:48	27	15:57 (LZ15)	17:27	18:05		19:42			20:18		20:49		
8	07:43		15:31 (LZ15)	07:19	06:36		06:40			05:54		05:28		
	16:49	27	15:58 (LZ15)	17:29	18:06		19:44			20:19		20:49		
9	07:43		15:31 (LZ15)	07:18	06:34		06:39			05:52		05:28		
	16:50	26	15:57 (LZ15)	17:30	18:07		19:45			20:21		20:50		
10	07:43		15:32 (LZ15)	07:17	06:33		06:37			05:51		05:27		
	16:51	25	15:57 (LZ15)	17:31	18:08		19:46			20:22		20:50		
11	07:43		15:34 (LZ15)	07:16	06:31		06:35			05:50		05:27		
	16:52	24	15:58 (LZ15)	17:33	18:10		19:47			20:23		20:51		
12	07:42		15:34 (LZ15)	07:14	06:29		06:34			05:49		05:27		
	16:53	23	15:57 (LZ15)	17:34	18:11		19:48			20:24		20:52		
13	07:42		15:36 (LZ15)	07:13	06:27		06:32		06:58 (LZ06)	05:47		05:27		
	16:54	21	15:57 (LZ15)	17:36	18:12		19:50		5	07:03 (LZ06)	20:25	20:52		
14	07:42		15:36 (LZ15)	07:11	06:25		06:30			06:54 (LZ06)	05:46	05:27		
	16:56	21	15:57 (LZ15)	17:37	18:13		19:51		12	07:06 (LZ06)	20:26	20:53		
15	07:41		15:38 (LZ15)	07:10	06:24		06:28			06:53 (LZ06)	05:45	05:27		
	16:57	19	15:57 (LZ15)	17:38	18:15		19:52		16	07:09 (LZ06)	20:27	20:53		
16	07:41		15:39 (LZ15)	07:08	06:22		06:27			06:51 (LZ06)	05:44	05:27		
	16:58	17	15:56 (LZ15)	17:40	18:16		19:53		18	07:09 (LZ06)	20:28	20:53		
17	07:40		15:41 (LZ15)	07:07	06:20		06:25			06:49 (LZ06)	05:43	05:27		
	16:59	14	15:55 (LZ15)	17:41	18:17		19:54		21	07:10 (LZ06)	20:29	20:54		
18	07:39		15:43 (LZ15)	07:06	06:18		06:23			06:49 (LZ06)	05:42	05:27		
	17:00	10	15:53 (LZ15)	17:42	18:18		19:56		22	07:11 (LZ06)	20:31	20:54		
19	07:39		15:47 (LZ15)	07:04	06:16		06:22			06:48 (LZ06)	05:41	05:27		
	17:02	3	15:50 (LZ15)	17:44	18:19	9	17:54 (LZ07)	19:57	22	07:10 (LZ06)	20:32	20:55		
20	07:38			07:03	06:15		17:42 (LZ07)	06:20		06:48 (LZ06)	05:40	05:27		
	17:03			17:45	18:21	14	17:56 (LZ07)	19:58	23	07:11 (LZ06)	20:33	20:55		
21	07:38			07:01	06:13		17:40 (LZ07)	06:18		06:47 (LZ06)	05:39	05:27		
	17:04			17:46	18:22	17	17:57 (LZ07)	19:59	23	07:10 (LZ06)	20:34	20:55		
22	07:37			06:59	06:11		17:38 (LZ07)	06:17		06:48 (LZ06)	05:38	05:27		
	17:06			17:48	18:23	20	17:58 (LZ07)	20:00	23	07:11 (LZ06)	20:35	20:55		
23	07:36			06:58	06:09		17:38 (LZ07)	06:15		06:47 (LZ06)	05:37	05:28		
	17:07			17:49	18:24	21	17:59 (LZ07)	20:02	23	07:10 (LZ06)	20:36	20:55		
24	07:35			06:56	06:07		17:37 (LZ07)	06:14		06:47 (LZ06)	05:36	05:28		
	17:08			17:50	18:26	22	17:59 (LZ07)	20:03	22	07:09 (LZ06)	20:37	20:56		
25	07:34			06:55	06:06		17:36 (LZ07)	06:12		06:48 (LZ06)	05:36	05:28		
	17:10			17:52	18:27	23	17:59 (LZ07)	20:04	20	07:08 (LZ06)	20:38	20:56		
26	07:34			06:53	06:04		17:36 (LZ07)	06:11		06:48 (LZ06)	05:35	05:28		
	17:11			17:53	18:28	22	17:58 (LZ07)	20:05	19	07:07 (LZ06)	20:39	20:56		
27	07:33			06:51	06:02		17:36 (LZ07)	06:09		06:49 (LZ06)	05:34	05:29		
	17:12			17:54	18:29	21	17:57 (LZ07)	20:06	17	07:06 (LZ06)	20:40	20:56		
28	07:32			06:50	06:00		17:36 (LZ07)	06:07		06:51 (LZ06)	05:33	05:29		
	17:14			17:56	18:30	20	17:56 (LZ07)	20:08	14	07:05 (LZ06)	20:41	20:56		
29	07:31				06:58		18:37 (LZ07)	06:06		06:53 (LZ06)	05:33	05:30		
	17:15				19:32	19	18:56 (LZ07)	20:09	9	07:02 (LZ06)	20:41	20:56		
30	07:30				06:57		18:38 (LZ07)	06:05			05:32	05:30		
	17:16				19:33	17	18:55 (LZ07)	20:10			20:42	20:56		
31	07:29				06:55		18:39 (LZ07)				05:31			
	17:18				19:34	14	18:53 (LZ07)				20:43			
Potential sun hours	289			293	369		402			456		462		
Total, worst case		425			239		317							
Sun reduction		0.28			0.31		0.40							
Oper. time red.		1.00			1.00		1.00							
Wind dir. red.		0.60			0.60		0.58							
Total reduction		0.17			0.18		0.23							
Total, real		72			44		73							

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_10 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 83.7° Slope: 90.0° (41)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:56	05:57 20:34	06:32 19:47	07:06 18:52	06:44 17:01	07:23 16:34 24 15:16 (LZ15)
2	05:31 20:55	05:58 20:33	06:33 19:45	07:07 18:51	06:46 17:00	07:24 16:33 24 15:16 (LZ15)
3	05:32 20:55	05:59 20:32	06:34 19:44	07:08 18:49	06:47 16:59	07:25 16:33 26 15:15 (LZ15)
4	05:32 20:55	06:00 20:30	06:35 19:42	07:09 18:47	06:48 16:57	07:26 16:33 27 15:15 (LZ15)
5	05:33 20:55	06:01 20:29	06:36 19:40	07:11 18:45	06:50 16:56	07:27 16:33 27 15:15 (LZ15)
6	05:34 20:54	06:02 20:28	06:37 19:38	07:12 18:43	06:51 16:55	07:28 16:32 27 15:16 (LZ15)
7	05:34 20:54	06:04 20:26	06:39 19:36	07:13 18:42	06:52 16:54	07:29 16:32 27 15:16 (LZ15)
8	05:35 20:54	06:05 20:25	06:40 19:35	07:14 18:40	06:54 16:52	07:30 16:32 28 15:16 (LZ15)
9	05:36 20:53	06:06 20:24	06:41 19:33	07:15 18:38	06:55 16:51	07:31 16:32 29 15:16 (LZ15)
10	05:36 20:53	06:07 20:22	06:42 19:31	07:17 18:36	06:56 16:50	07:32 16:32 28 15:17 (LZ15)
11	05:37 20:52	06:08 20:21	06:43 19:29	18:34 (LZ07) 18:42 (LZ07)	07:18 18:35	06:57 16:49
12	05:38 20:52	06:09 20:19	06:44 19:27	18:31 (LZ07) 18:44 (LZ07)	07:19 18:33	06:59 16:48
13	05:39 20:51	06:10 20:18	06:45 19:25	18:29 (LZ07) 18:46 (LZ07)	07:20 18:31	07:00 16:47
14	05:39 20:51	06:11 20:17	06:46 19:24	18:27 (LZ07) 18:46 (LZ07)	07:21 18:29	07:01 16:46
15	05:40 20:50	06:13 20:15	06:48 19:22	18:26 (LZ07) 18:47 (LZ07)	07:23 18:28	07:03 16:45
16	05:41 20:49	06:14 20:14	06:49 19:20	18:25 (LZ07) 18:47 (LZ07)	07:24 18:26	07:04 16:44
17	05:42 20:49	06:15 20:12	06:50 19:18	18:24 (LZ07) 18:46 (LZ07)	07:25 18:24	07:05 16:43
18	05:43 20:48	06:16 20:10	06:51 19:16	18:24 (LZ07) 18:46 (LZ07)	07:26 18:23	07:07 16:42
19	05:44 20:47	06:17 20:09	06:52 19:14	18:23 (LZ07) 18:45 (LZ07)	07:28 18:21	07:08 16:41
20	05:45 20:46	06:18 20:07	06:53 19:13	18:23 (LZ07) 18:44 (LZ07)	07:29 18:19	07:09 16:40
21	05:46 20:45	06:19 20:06	06:54 19:11	18:24 (LZ07) 18:44 (LZ07)	07:30 18:18	07:10 16:40
22	05:47 20:45	06:20 20:04	06:55 19:09	18:25 (LZ07) 18:43 (LZ07)	07:31 18:16	07:12 16:39
23	05:48 20:44	06:22 20:02	06:57 19:07	18:26 (LZ07) 18:41 (LZ07)	07:33 18:15	07:13 16:38
24	05:49 20:43	06:23 20:01	06:58 19:05	18:27 (LZ07) 18:38 (LZ07)	07:34 18:13	07:14 16:37
25	05:50 20:42	06:24 19:59	06:59 19:03	18:35 17:12	07:15 16:37	07:15 15:18 (LZ15)
26	05:51 20:41	06:25 19:57	07:00 19:01	18:36 17:10	07:16 16:36	07:16 15:32 (LZ15)
27	05:52 20:40	06:26 19:56	07:01 19:00	18:37 17:09	07:17 16:36	07:17 15:17 (LZ15)
28	05:53 20:39	06:27 19:54	07:02 18:58	18:38 17:07	07:18 16:35	07:18 15:36 (LZ15)
29	05:54 20:38	06:28 19:52	07:04 18:56	18:39 17:06	07:19 16:35	07:19 15:16 (LZ15)
30	05:55 20:36	06:29 19:51	07:05 18:54	18:40 17:04	07:20 16:34	07:20 15:37 (LZ15)
31	05:56 20:35	06:31 19:49	18:55 17:03	18:41 17:02	07:21 16:33	07:21 15:18 (LZ15)
Potential sun hours	468	434	376	342	291	278
Total, worst case		308	251		128	877
Sun reduction		0.65	0.59		0.36	0.26
Oper. time red.		1.00	1.00		1.00	1.00
Wind dir. red.		0.58	0.60		0.60	0.60
Total reduction		0.38	0.36		0.22	0.16
Total, real		116	89		28	140

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		





SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_11 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 87.5° Slope: 90.0° (42)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

January				February March				April				May				June			
1	07:44		15:38 (LZ15)	07:28	06:48			06:53		18:43 (LZ07)	06:03			06:37 (LZ06)	05:31				
	16:42	28	16:06 (LZ15)	17:19	17:57			19:35		19:05 (LZ07)	20:11		22	06:59 (LZ06)	20:44				
2	07:44		15:39 (LZ15)	07:27	06:46			06:51		18:43 (LZ07)	06:02			06:37 (LZ06)	05:30				
	16:43	28	16:07 (LZ15)	17:20	17:58			19:36	21	19:04 (LZ07)	20:12		21	06:58 (LZ06)	20:45				
3	07:44		15:39 (LZ15)	07:25	06:45			06:49		18:44 (LZ07)	06:00			06:38 (LZ06)	05:30				
	16:44	28	16:07 (LZ15)	17:22	17:59			19:38	20	19:04 (LZ07)	20:14		20	06:58 (LZ06)	20:46				
4	07:44		15:39 (LZ15)	07:24	06:43			06:48		18:44 (LZ07)	05:59			06:39 (LZ06)	05:29				
	16:45	29	16:08 (LZ15)	17:23	18:01			19:39	18	19:02 (LZ07)	20:15		17	06:56 (LZ06)	20:46				
5	07:44		15:39 (LZ15)	07:23	06:41			06:46		18:45 (LZ07)	05:57			06:40 (LZ06)	05:29				
	16:46	29	16:08 (LZ15)	17:25	18:02			19:40	15	19:00 (LZ07)	20:16		15	06:55 (LZ06)	20:47				
6	07:44		15:39 (LZ15)	07:22	06:40			06:44		18:46 (LZ07)	05:56			06:42 (LZ06)	05:29				
	16:47	29	16:08 (LZ15)	17:26	18:03			19:41	12	18:58 (LZ07)	20:17		11	06:53 (LZ06)	20:48				
7	07:44		15:40 (LZ15)	07:21	06:38			06:42		18:50 (LZ07)	05:55			06:44 (LZ06)	05:28				
	16:48	29	16:09 (LZ15)	17:27	18:05			19:42	4	18:54 (LZ07)	20:18		6	06:50 (LZ06)	20:49				
8	07:43		15:40 (LZ15)	07:19	06:36			06:40			05:54				05:28				
	16:49	30	16:10 (LZ15)	17:29	18:06			19:44			20:19				20:49				
9	07:43		15:40 (LZ15)	07:18	06:34			06:39			05:52				05:28				
	16:50	30	16:10 (LZ15)	17:30	18:07			19:45			20:21				20:50				
10	07:43		15:41 (LZ15)	07:17	06:33			06:37			05:51				05:27				
	16:51	30	16:11 (LZ15)	17:31	18:08			19:46			20:22				20:50				
11	07:43		15:42 (LZ15)	07:16	06:31			06:35			05:50				05:27				
	16:52	29	16:11 (LZ15)	17:33	18:10			19:47			20:23				20:51				
12	07:42		15:41 (LZ15)	07:14	06:29			06:34			05:49				05:27				
	16:53	30	16:11 (LZ15)	17:34	18:11			19:48			20:24				20:52				
13	07:42		15:42 (LZ15)	07:13	06:27			06:32			05:47				05:27				
	16:54	30	16:12 (LZ15)	17:36	18:12			19:50			20:25				20:52				
14	07:42		15:42 (LZ15)	07:11	06:25			06:30			05:46				05:27				
	16:56	30	16:12 (LZ15)	17:37	18:13			19:51			20:26				20:53				
15	07:41		15:43 (LZ15)	07:10	06:24			06:28			05:45				05:27				
	16:57	30	16:13 (LZ15)	17:38	18:15			19:52			20:27				20:53				
16	07:41		15:43 (LZ15)	07:08	06:22			06:27			05:44				05:27				
	16:58	29	16:12 (LZ15)	17:40	18:16			19:53			20:28				20:53				
17	07:40		15:45 (LZ15)	07:07	06:20			06:25			05:43				05:27				
	16:59	28	16:13 (LZ15)	17:41	18:17			19:54			20:29				20:54				
18	07:39		15:45 (LZ15)	07:06	06:18			06:23			05:42				05:27				
	17:00	28	16:13 (LZ15)	17:42	18:18			19:56			20:31				20:54				
19	07:39		15:45 (LZ15)	07:04	06:16			06:22			05:41				05:27				
	17:02	28	16:13 (LZ15)	17:44	18:19			19:57			20:32				20:55				
20	07:38		15:46 (LZ15)	07:03	06:15			06:20		06:45 (LZ06)	05:40				05:27				
	17:03	26	16:12 (LZ15)	17:45	18:21			19:58	10	06:55 (LZ06)	20:33				20:55				
21	07:38		15:47 (LZ15)	07:01	06:13			06:18		06:42 (LZ06)	05:39				05:27				
	17:04	26	16:13 (LZ15)	17:46	18:22			19:59	15	06:57 (LZ06)	20:34				20:55				
22	07:37		15:48 (LZ15)	06:59	06:11			06:17		06:41 (LZ06)	05:38				05:27				
	17:06	24	16:12 (LZ15)	17:48	18:23			20:00	18	06:59 (LZ06)	20:35				20:55				
23	07:36		15:49 (LZ15)	06:58	06:09			06:15		06:39 (LZ06)	05:37				05:28				
	17:07	23	16:12 (LZ15)	17:49	18:24			20:02	20	06:59 (LZ06)	20:36				20:55				
24	07:35		15:50 (LZ15)	06:56	06:07			06:14		06:38 (LZ06)	05:36				05:28				
	17:08	21	16:11 (LZ15)	17:50	18:26	5	17:59 (LZ07)	20:03	21	06:59 (LZ06)	20:37				20:56				
25	07:34		15:51 (LZ15)	06:55	06:06			06:12		06:38 (LZ06)	05:36				05:28				
	17:10	19	16:10 (LZ15)	17:52	18:27	12	18:02 (LZ07)	20:04	22	07:00 (LZ06)	20:38				20:56				
26	07:34		15:53 (LZ15)	06:53	06:04			06:11		06:37 (LZ06)	05:35				05:28				
	17:11	16	16:09 (LZ15)	17:53	18:28	16	18:04 (LZ07)	20:05	23	07:00 (LZ06)	20:39				20:56				
27	07:33		15:55 (LZ15)	06:51	06:02			06:09		06:37 (LZ06)	05:34				05:29				
	17:12	12	16:07 (LZ15)	17:54	18:29	19	18:05 (LZ07)	20:06	23	07:00 (LZ06)	20:40				20:56				
28	07:32		16:00 (LZ15)	06:50	06:00			06:07		06:37 (LZ06)	05:33				05:29				
	17:14	3	16:03 (LZ15)	17:56	18:30	20	18:05 (LZ07)	20:08	24	07:01 (LZ06)	20:40				20:56				
29	07:31				06:58			06:06		06:36 (LZ06)	05:33				05:30				
	17:15				19:32	21	19:06 (LZ07)	20:09	24	07:00 (LZ06)	20:41				20:56				
30	07:30				06:57			06:05		06:37 (LZ06)	05:32				05:30				
	17:16				19:33	22	19:06 (LZ07)	20:10	23	07:00 (LZ06)	20:42				20:56				
31	07:29				06:55			18:43 (LZ07)			05:31								
	17:18				19:34	22	19:05 (LZ07)				20:43								
Potential sun hours	289			293	369			402			456				462				
Total, worst case		722				137			335			112							
Sun reduction		0.28				0.31			0.40			0.47							
Oper. time red.		1.00				1.00			1.00			1.00							
Wind dir. red.		0.61				0.61			0.58			0.57							
Total reduction		0.17				0.19			0.23			0.27							
Total, real		123				25			77			30							

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

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

Calculation: Real Case Shadow receptor: KrU_11 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 87.5° Slope: 90.0° (42)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:56	05:57 20:34	06:32 19:47	07:06 18:52	06:44 17:01	07:23 16:34 29 15:24 (LZ15)
2	05:31 20:55	05:58 20:33	06:33 19:45	07:07 18:51	06:46 17:00	07:24 16:33 30 15:24 (LZ15)
3	05:32 20:55	05:59 20:32	06:34 19:44	07:08 18:49	06:47 16:59	07:25 16:33 30 15:24 (LZ15)
4	05:32 20:55	06:00 20:30	06:35 19:42	07:09 18:47	06:48 16:57	07:26 16:33 30 15:24 (LZ15)
5	05:33 20:55	06:01 20:29	06:36 19:40	07:11 18:45	06:50 16:56	07:27 16:33 29 15:25 (LZ15)
6	05:34 20:54	06:02 20:28	06:37 19:38	07:12 18:43	06:51 16:55	07:28 16:32 29 15:25 (LZ15)
7	05:34 20:54	06:04 20:26	06:39 19:36	07:13 18:42	06:52 16:54	07:29 16:32 29 15:26 (LZ15)
8	05:35 20:54	06:05 20:25	06:40 19:35	07:14 18:40	06:54 16:52	07:30 16:32 29 15:26 (LZ15)
9	05:36 20:53	06:06 20:24	06:41 19:33	07:15 18:38	06:55 16:51	07:31 16:32 28 15:27 (LZ15)
10	05:36 20:53	06:07 20:22	06:42 19:31	07:17 18:36	06:56 16:50	07:32 16:32 28 15:28 (LZ15)
11	05:37 20:52	06:08 20:21	06:43 19:29	07:18 18:35	06:57 16:49	07:33 16:32 28 15:28 (LZ15)
12	05:38 20:52	06:09 20:19	06:44 19:27	07:19 18:33	06:59 16:48	07:34 16:32 27 15:29 (LZ15)
13	05:39 20:51	06:10 20:18	06:45 19:25	07:20 18:31	07:00 16:47	07:34 16:32 27 15:30 (LZ15)
14	05:39 20:51	06:11 20:17	06:46 19:24	07:21 18:29	07:01 16:46	07:35 16:32 26 15:30 (LZ15)
15	05:40 20:50	06:13 20:15	06:48 19:22	07:23 18:28	07:03 16:45	07:36 16:33 26 15:31 (LZ15)
16	05:41 20:49	06:14 20:14	06:49 19:20	07:24 18:26	07:04 16:44	07:37 16:33 27 15:31 (LZ15)
17	05:42 20:49	06:15 20:12	06:50 19:18	07:25 18:24	07:05 16:43	07:37 16:33 26 15:32 (LZ15)
18	05:43 20:48	06:16 20:10	06:51 19:16	07:26 18:23	07:07 16:42	07:38 16:33 26 15:32 (LZ15)
19	05:44 20:47	06:17 20:09	06:52 19:14	07:28 18:21	07:08 16:41	07:39 16:34 26 15:33 (LZ15)
20	05:45 20:46	06:18 20:07	06:53 19:13	07:29 18:19	07:09 16:40	07:39 16:34 26 15:33 (LZ15)
21	05:46 20:45	06:19 20:06	06:54 19:11	07:30 18:18	07:10 16:40	07:40 16:34 26 15:34 (LZ15)
22	05:47 20:45	06:20 20:04	06:55 19:09	07:31 18:16	07:12 16:39	07:40 16:35 26 16:00 (LZ15)
23	05:48 20:44	06:22 20:02	06:57 19:07	07:33 18:15	07:13 16:38	07:41 16:35 26 16:01 (LZ15)
24	05:49 20:43	06:23 20:01	06:58 19:05	07:34 18:13	07:14 16:37	07:41 16:36 26 16:01 (LZ15)
25	05:50 20:42	06:24 19:59	06:59 19:03	07:35 18:12	07:15 16:37	07:42 16:37 26 16:02 (LZ15)
26	05:51 20:41	06:25 19:57	07:00 19:01	07:37 18:10	07:17 16:36	07:42 16:37 26 16:02 (LZ15)
27	05:52 20:40	06:26 19:56	07:01 19:00	07:38 18:09	07:18 16:36	07:43 16:38 26 16:02 (LZ15)
28	05:53 20:39	06:27 19:54	07:02 18:58	07:39 18:07	07:19 16:35	07:43 16:39 27 16:03 (LZ15)
29	05:54 20:38	06:28 19:52	07:04 18:56	07:40 18:06	07:20 16:35	07:43 16:39 26 16:04 (LZ15)
30	05:55 20:36	06:29 19:51	07:05 18:54	07:42 18:04	07:21 16:34	07:43 16:40 27 16:05 (LZ15)
31	05:56 20:35	06:31 19:49		07:43 17:03		07:43 16:41 27 16:05 (LZ15)
Potential sun hours	468	434	376	342	291	278
Total, worst case		336	252		406	845
Sun reduction		0.65	0.59		0.36	0.26
Oper. time red.		1.00	1.00		1.00	1.00
Wind dir. red.		0.57	0.61		0.61	0.61
Total reduction		0.37	0.36		0.22	0.16
Total, real		124	91		90	135

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_12 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 89.2° Slope: 90.0° (43)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January		February		March		April		May		June	
1	07:44 16:42		07:28 17:19	30	16:03 (LZ15) 16:33 (LZ15)	06:48 17:57	06:53 19:35		06:03 20:11	11	06:27 (LZ06) 06:38 (LZ06)	05:31 20:44
2	07:44 16:43		07:27 17:20	30	16:03 (LZ15) 16:33 (LZ15)	06:46 17:58	06:51 19:36		06:02 20:12	15	06:25 (LZ06) 06:40 (LZ06)	05:30 20:45
3	07:44 16:44		07:25 17:22	29	16:03 (LZ15) 16:32 (LZ15)	06:45 17:59	06:49 19:38	8	19:04 (LZ07) 19:12 (LZ07)	18	06:24 (LZ06) 06:42 (LZ06)	05:30 20:46
4	07:44 16:45		07:24 17:23	27	16:04 (LZ15) 16:31 (LZ15)	06:43 18:01	06:48 19:39	13	19:01 (LZ07) 19:14 (LZ07)	19	06:23 (LZ06) 06:42 (LZ06)	05:29 20:46
5	07:44 16:46		07:23 17:25	25	16:06 (LZ15) 16:31 (LZ15)	06:41 18:02	06:46 19:40	17	18:59 (LZ07) 19:16 (LZ07)	21	06:22 (LZ06) 06:43 (LZ06)	05:29 20:47
6	07:44 16:47		07:22 17:26	23	16:07 (LZ15) 16:30 (LZ15)	06:40 18:03	06:44 19:41	19	18:57 (LZ07) 19:16 (LZ07)	22	06:22 (LZ06) 06:44 (LZ06)	05:29 20:48
7	07:44 16:48		07:21 17:27	20	16:08 (LZ15) 16:28 (LZ15)	06:38 18:05	06:42 19:42	20	18:56 (LZ07) 19:16 (LZ07)	22	06:21 (LZ06) 06:43 (LZ06)	05:28 20:49
8	07:43 16:49		07:19 17:29	17	16:10 (LZ15) 16:27 (LZ15)	06:36 18:06	06:40 19:44	21	18:56 (LZ07) 19:17 (LZ07)	22	06:21 (LZ06) 06:43 (LZ06)	05:28 20:49
9	07:43 16:50		07:18 17:30	12	16:13 (LZ15) 16:25 (LZ15)	06:34 18:07	06:39 19:45	22	18:55 (LZ07) 19:17 (LZ07)	23	06:21 (LZ06) 06:44 (LZ06)	05:28 20:50
10	07:43 16:51		07:17 17:31			06:33 18:08	06:37 19:46	23	18:54 (LZ07) 19:17 (LZ07)	23	06:21 (LZ06) 06:44 (LZ06)	05:27 20:50
11	07:43 16:52	7	16:08 (LZ15) 16:15 (LZ15)	17:33		06:31 18:10	06:35 19:47	22	18:55 (LZ07) 19:17 (LZ07)	23	06:21 (LZ06) 06:44 (LZ06)	05:27 20:51
12	07:42 16:53	11	16:06 (LZ15) 16:17 (LZ15)	17:14		06:29 18:11	06:34 19:48	21	18:55 (LZ07) 19:16 (LZ07)	23	06:21 (LZ06) 06:44 (LZ06)	05:27 20:52
13	07:42 16:54	15	16:05 (LZ15) 16:20 (LZ15)	17:13		06:27 18:12	06:32 19:50	20	18:55 (LZ07) 19:15 (LZ07)	21	06:21 (LZ06) 06:42 (LZ06)	05:27 20:52
14	07:42 16:56	17	16:04 (LZ15) 16:21 (LZ15)	17:11		06:25 18:13	06:30 19:51	19	18:55 (LZ07) 19:14 (LZ07)	21	06:21 (LZ06) 06:42 (LZ06)	05:27 20:53
15	07:41 16:57	19	16:04 (LZ15) 16:23 (LZ15)	17:10		06:24 18:15	06:28 19:52	17	18:56 (LZ07) 19:13 (LZ07)	19	06:22 (LZ06) 06:41 (LZ06)	05:27 20:53
16	07:41 16:58	21	16:03 (LZ15) 16:24 (LZ15)	17:08		06:22 18:16	06:27 19:53	14	18:57 (LZ07) 19:11 (LZ07)	19	06:22 (LZ06) 06:41 (LZ06)	05:27 20:53
17	07:40 16:59	23	16:03 (LZ15) 16:26 (LZ15)	17:07		06:20 18:17	06:25 19:54	9	18:59 (LZ07) 19:08 (LZ07)	17	06:23 (LZ06) 06:40 (LZ06)	05:27 20:54
18	07:39 17:00	24	16:02 (LZ15) 16:26 (LZ15)	17:06		06:18 18:18	06:23 19:56		05:42 20:31	15	06:24 (LZ06) 06:39 (LZ06)	05:27 20:54
19	07:39 17:02	26	16:01 (LZ15) 16:27 (LZ15)	17:04		06:16 18:19	06:22 19:57		05:41 20:32	13	06:26 (LZ06) 06:39 (LZ06)	05:27 20:55
20	07:38 17:03	27	16:01 (LZ15) 16:28 (LZ15)	17:03		06:15 18:21	06:20 19:58		05:40 20:33	9	06:28 (LZ06) 06:37 (LZ06)	05:27 20:55
21	07:38 17:04	28	16:01 (LZ15) 16:29 (LZ15)	17:01		06:13 18:22	06:18 19:59		05:39 20:34	1	06:32 (LZ06) 06:33 (LZ06)	05:27 20:55
22	07:37 17:06	29	16:01 (LZ15) 16:30 (LZ15)	16:59		06:11 18:23	06:17 20:00		05:38 20:35			05:27 20:55
23	07:36 17:07	29	16:01 (LZ15) 16:30 (LZ15)	16:58		06:09 18:24	06:15 20:02		05:37 20:36			05:28 20:55
24	07:35 17:08	30	16:01 (LZ15) 16:31 (LZ15)	16:56		06:07 18:26	06:14 20:03		05:36 20:37			05:28 20:56
25	07:34 17:10	31	16:00 (LZ15) 16:31 (LZ15)	16:55		06:06 18:27	06:12 20:04		05:36 20:38			05:28 20:56
26	07:34 17:11	32	16:00 (LZ15) 16:32 (LZ15)	16:53		06:04 18:28	06:11 20:05		05:35 20:39			05:28 20:56
27	07:33 17:12	31	16:01 (LZ15) 16:32 (LZ15)	16:51		06:02 18:29	06:09 20:06		05:34 20:40			05:29 20:56
28	07:32 17:14	31	16:01 (LZ15) 16:32 (LZ15)	16:50		06:00 18:30	06:07 20:08		05:33 20:40			05:29 20:56
29	07:31 17:15	32	16:01 (LZ15) 16:33 (LZ15)			06:58 19:32	06:06 20:09		05:33 20:41			05:30 20:56
30	07:30 17:16	32	16:01 (LZ15) 16:33 (LZ15)			06:57 19:33	06:05 20:10	5	06:31 (LZ06) 06:36 (LZ06)			05:30 20:56
31	07:29 17:18	31	16:02 (LZ15) 16:33 (LZ15)			06:55 19:34			05:31 20:43			
Potential sun hours	289		293			369	402		456		462	
Total, worst case	526		213				270		377			
Sun reduction	0.28		0.29				0.40		0.47			
Oper. time red.	1.00		1.00				1.00		1.00			
Wind dir. red.	0.61		0.61				0.61		0.58			
Total reduction	0.17		0.18				0.24		0.27			
Total, real	90		38				66		102			

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_12 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 89.2° Slope: 90.0° (43)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

July		August		September		October		November		December	
1	05:31 20:56	05:57 20:34	06:31 (LZ06) 19:47	06:32 19:47	18:54 (LZ07) 18:52	07:06 18:52	06:44 17:01	15:46 (LZ15) 16:34	07:23 16:34	15:50 (LZ15) 15:57 (LZ15)	
2	05:31 20:55	05:58 20:33	06:30 (LZ06) 19:45	06:33 19:45	18:53 (LZ07) 18:51	07:07 18:51	06:46 17:00	15:42 (LZ15) 15:55 (LZ15)	07:24 16:33		
3	05:32 20:55	05:59 20:32	06:30 (LZ06) 19:44	06:34 19:44	18:53 (LZ07) 18:49	07:08 18:49	06:47 16:59	15:40 (LZ15) 15:57 (LZ15)	07:25 16:33		
4	05:32 20:55	06:00 20:30	06:31 (LZ06) 19:42	06:35 19:42	18:53 (LZ07) 18:47	07:09 18:47	06:48 16:57	15:37 (LZ15) 15:58 (LZ15)	07:26 16:33		
5	05:33 20:55	06:01 20:29	06:31 (LZ06) 19:40	06:36 19:40	18:53 (LZ07) 18:45	07:11 18:45	06:50 16:56	15:37 (LZ15) 16:00 (LZ15)	07:27 16:33		
6	05:34 20:54	06:02 20:28	06:31 (LZ06) 19:38	06:37 19:38	18:53 (LZ07) 18:43	07:12 18:43	06:51 16:55	15:35 (LZ15) 16:01 (LZ15)	07:28 16:32		
7	05:34 20:54	06:04 20:26	06:32 (LZ06) 19:36	06:39 19:36	18:54 (LZ07) 18:42	07:13 18:42	06:52 16:54	15:35 (LZ15) 16:02 (LZ15)	07:29 16:32		
8	05:35 20:54	06:05 20:25	06:32 (LZ06) 19:35	06:40 19:35	18:55 (LZ07) 18:40	07:14 18:40	06:54 16:52	15:34 (LZ15) 16:03 (LZ15)	07:30 16:32		
9	05:36 20:53	06:06 20:24	06:33 (LZ06) 19:33	06:41 19:33	18:57 (LZ07) 18:38	07:15 18:38	06:55 16:51	15:33 (LZ15) 16:03 (LZ15)	07:31 16:32		
10	05:36 20:53	06:07 20:22	06:33 (LZ06) 19:31	06:42 19:31	19:06 (LZ07) 18:36	07:17 18:36	06:56 16:50	15:34 (LZ15) 16:04 (LZ15)	07:32 16:32		
11	05:37 20:52	06:08 20:21	06:34 (LZ06) 19:29	06:43 19:29	18:57 (LZ07) 18:35	07:18 18:35	06:57 16:49	15:33 (LZ15) 16:04 (LZ15)	07:33 16:32		
12	05:38 20:52	06:09 20:19	06:36 (LZ06) 19:27	06:44 19:27	18:57 (LZ07) 18:33	07:19 18:33	06:59 16:48	15:33 (LZ15) 16:05 (LZ15)	07:34 16:32		
13	05:39 20:51	06:10 20:18	06:45 19:25	06:45 19:25	18:57 (LZ07) 18:31	07:20 18:31	07:00 16:47	15:33 (LZ15) 16:05 (LZ15)	07:34 16:32		
14	05:39 20:51	06:11 20:17	06:46 19:24	06:46 19:24	18:57 (LZ07) 18:29	07:21 18:29	07:01 16:46	15:33 (LZ15) 16:04 (LZ15)	07:35 16:32		
15	05:40 20:50	06:13 20:15	06:48 19:22	06:48 19:22	18:57 (LZ07) 18:28	07:23 18:28	07:03 16:45	15:34 (LZ15) 16:05 (LZ15)	07:36 16:33		
16	05:41 20:49	06:14 20:14	06:49 19:20	06:49 19:20	18:57 (LZ07) 18:26	07:24 18:26	07:04 16:44	15:33 (LZ15) 16:05 (LZ15)	07:37 16:33		
17	05:42 20:49	06:15 20:12	06:50 19:18	06:50 19:18	18:57 (LZ07) 18:24	07:25 18:24	07:05 16:43	15:34 (LZ15) 16:05 (LZ15)	07:37 16:33		
18	05:43 20:48	06:16 20:10	06:51 19:16	06:51 19:16	18:57 (LZ07) 18:23	07:26 18:23	07:07 16:42	15:35 (LZ15) 16:05 (LZ15)	07:38 16:33		
19	05:44 20:47	06:17 20:09	06:52 19:14	06:52 19:14	18:57 (LZ07) 18:21	07:28 18:21	07:08 16:41	15:35 (LZ15) 16:04 (LZ15)	07:39 16:34		
20	05:45 20:46	06:18 20:07	06:53 19:13	06:53 19:13	18:57 (LZ07) 18:19	07:29 18:19	07:09 16:40	15:36 (LZ15) 16:05 (LZ15)	07:39 16:34		
21	05:46 20:45	06:19 20:06	06:54 19:11	06:54 19:11	18:57 (LZ07) 18:18	07:30 18:18	07:10 16:40	15:36 (LZ15) 16:04 (LZ15)	07:40 16:35		
22	05:47 20:45	06:20 20:04	06:55 19:09	06:55 19:09	18:57 (LZ07) 18:16	07:31 18:16	07:12 16:39	15:37 (LZ15) 16:04 (LZ15)	07:40 16:35		
23	05:48 20:44	06:22 20:02	06:57 19:07	06:57 19:07	18:57 (LZ07) 18:15	07:33 18:15	07:13 16:38	15:38 (LZ15) 16:04 (LZ15)	07:41 16:35		
24	05:49 20:43	06:23 20:01	06:58 19:05	06:58 19:05	18:57 (LZ07) 18:13	07:34 18:13	07:14 16:37	15:39 (LZ15) 16:03 (LZ15)	07:41 16:36		
25	05:50 20:42	06:24 19:59	06:59 19:03	06:59 19:03	18:57 (LZ07) 17:12	07:35 17:12	07:15 16:37	15:40 (LZ15) 16:03 (LZ15)	07:42 16:37		
26	05:51 20:41	06:25 19:57	07:00 19:01	07:00 19:01	18:57 (LZ07) 17:10	07:36 17:10	07:17 16:36	15:42 (LZ15) 16:03 (LZ15)	07:42 16:37		
27	05:52 20:40	06:26 19:56	07:01 19:00	07:01 19:00	18:57 (LZ07) 17:09	07:38 17:09	07:18 16:36	15:43 (LZ15) 16:02 (LZ15)	07:43 16:38		
28	05:53 20:39	06:27 19:54	07:02 18:58	07:02 18:58	18:57 (LZ07) 17:07	07:39 17:07	07:19 16:35	15:44 (LZ15) 16:01 (LZ15)	07:43 16:39		
29	05:54 20:38	06:28 19:52	07:04 18:56	07:04 18:56	18:57 (LZ07) 17:06	07:40 17:06	07:20 16:35	15:45 (LZ15) 16:00 (LZ15)	07:43 16:39		
30	05:55 20:36	06:29 19:51	07:05 18:55	07:05 18:55	18:57 (LZ07) 17:04	07:42 17:04	07:21 16:34	15:48 (LZ15) 15:59 (LZ15)	07:43 16:40		
31	05:56 20:35	06:31 19:49	07:06 18:55	07:06 18:55	18:57 (LZ07) 17:03	07:43 17:03	16:34 16:41	15:59 (LZ15) 16:41	16:40 16:41		
Potential sun hours		468	434	376	342	291	278				
Total, worst case		147	340	168		739				7	
Sun reduction		0.59	0.65	0.59		0.36				0.26	
Oper. time red.		1.00	1.00	1.00		1.00				1.00	
Wind dir. red.		0.58	0.59	0.61		0.61				0.61	
Total reduction		0.34	0.38	0.36		0.22				0.16	
Total, real		50	129	61		164				1	

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_13 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 56.5° Slope: 90.0° (64)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March	April	May	June
1	07:44 16:42	07:28 17:19	16:41 (LZ15) 16:46 (LZ15)	06:48 17:57	07:10 (LZ16) 07:29 (LZ16)	06:53 19:35
2	07:44 16:43	07:27 17:20	16:37 (LZ15) 16:50 (LZ15)	06:46 17:58	07:09 (LZ16) 07:29 (LZ16)	06:51 19:36
3	07:44 16:44	07:25 17:22	16:35 (LZ15) 16:51 (LZ15)	06:45 17:59	07:08 (LZ16) 07:29 (LZ16)	06:49 19:38
4	07:44 16:45	07:24 17:23	16:34 (LZ15) 16:53 (LZ15)	06:43 18:01	07:08 (LZ16) 07:30 (LZ16)	06:48 19:39
5	07:44 16:46	07:23 17:25	16:33 (LZ15) 16:55 (LZ15)	06:41 18:02	07:08 (LZ16) 07:30 (LZ16)	06:46 19:40
6	07:44 16:47	07:22 17:26	16:32 (LZ15) 16:56 (LZ15)	06:40 18:03	07:07 (LZ16) 07:29 (LZ16)	06:44 19:41
7	07:44 16:48	07:21 17:27	16:31 (LZ15) 16:56 (LZ15)	06:38 18:05	07:07 (LZ16) 07:28 (LZ16)	06:42 19:42
8	07:43 16:49	07:19 17:29	16:31 (LZ15) 16:57 (LZ15)	06:36 18:06	07:08 (LZ16) 07:28 (LZ16)	06:40 19:44
9	07:43 16:50	07:18 17:30	16:31 (LZ15) 16:58 (LZ15)	06:34 18:07	07:09 (LZ16) 07:26 (LZ16)	06:39 19:45
10	07:43 16:51	07:17 17:31	16:30 (LZ15) 16:58 (LZ15)	06:33 18:08	07:10 (LZ16) 07:25 (LZ16)	06:37 19:46
11	07:43 16:52	07:15 17:33	16:30 (LZ15) 16:58 (LZ15)	06:31 18:10	07:11 (LZ16) 07:22 (LZ16)	06:35 19:47
12	07:42 16:53	07:14 17:34	16:30 (LZ15) 16:59 (LZ15)	06:29 18:11	06:34 19:48	05:49 20:24
13	07:42 16:54	07:13 17:35	16:30 (LZ15) 16:58 (LZ15)	06:27 18:12	06:32 19:50	05:47 20:25
14	07:42 16:56	07:11 17:37	16:31 (LZ15) 16:59 (LZ15)	06:25 18:13	06:30 19:51	05:46 20:26
15	07:41 16:57	07:10 17:38	16:30 (LZ15) 16:58 (LZ15)	06:24 18:15	06:28 19:52	05:45 20:27
16	07:41 16:58	07:08 17:40	16:31 (LZ15) 16:58 (LZ15)	06:22 18:16	06:27 19:53	05:44 20:28
17	07:40 16:59	07:07 17:41	16:32 (LZ15) 16:56 (LZ15)	06:20 18:17	06:25 19:54	05:43 20:29
18	07:39 17:00	07:06 17:42	16:33 (LZ15) 16:56 (LZ15)	06:18 18:18	06:23 19:56	05:42 20:31
19	07:39 17:02	07:04 17:44	16:34 (LZ15) 16:54 (LZ15)	06:16 18:19	06:22 19:57	05:41 20:32
20	07:38 17:03	07:02 17:45	16:36 (LZ15) 16:53 (LZ15)	06:15 18:21	06:20 19:58	05:40 20:33
21	07:38 17:04	07:01 17:46	16:38 (LZ15) 16:50 (LZ15)	06:13 18:22	06:18 19:59	05:39 20:34
22	07:37 17:06	06:59 17:48	16:43 (LZ15) 16:44 (LZ15)	06:11 18:23	06:17 20:00	05:38 20:35
23	07:36 17:07	06:58 17:49	06:09 18:24	06:09 18:24	06:15 20:02	05:37 20:36
24	07:35 17:08	06:56 17:50	06:07 18:26	06:07 18:26	06:14 20:03	05:36 20:37
25	07:34 17:10	06:55 17:52	06:06 18:27	06:06 18:27	06:12 20:04	05:36 20:38
26	07:34 17:11	06:53 17:53	07:17 (LZ16) 07:23 (LZ16)	06:04 18:28	06:11 20:05	05:35 20:39
27	07:33 17:12	06:51 17:54	07:13 (LZ16) 07:26 (LZ16)	06:02 18:29	06:09 20:06	05:34 20:40
28	07:32 17:14	06:50 17:56	07:12 (LZ16) 07:28 (LZ16)	06:00 18:30	06:07 20:08	05:33 20:40
29	07:31 17:15		06:58 19:32	06:06 19:32	06:06 20:09	05:33 20:41
30	07:30 17:16		06:57 19:33	06:05 19:33	06:05 20:10	05:32 20:42
31	07:29 17:18		06:55 19:34	06:06 19:34	06:06 20:10	05:31 20:43
Potential sun hours	289	293	369	402	456	462
Total, worst case		505	210		373	656
Sun reduction		0.29	0.31		0.47	0.49
Oper. time red.		1.00	1.00		1.00	1.00
Wind dir. red.		0.60	0.61		0.59	0.59
Total reduction		0.17	0.19		0.28	0.29
Total, real		88	39		104	192

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_13 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 56.5° Slope: 90.0° (64)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

July		August		September		October		November		December	
1	05:31 20:56	06:15 (LZ06) 06:36 (LZ06)	05:57 20:34	06:32 19:47	07:06 18:52			06:44 17:01	15:59 (LZ15) 16:27 (LZ15)	07:22 16:34	
2	05:31 20:55	06:14 (LZ06) 06:36 (LZ06)	05:58 20:33	06:33 19:45	07:07 18:51	8	07:51 (LZ16) 07:59 (LZ16)	06:46 17:00	16:00 (LZ15) 16:28 (LZ15)	07:24 16:33	
3	05:32 20:55	06:15 (LZ06) 06:37 (LZ06)	05:59 20:32	06:34 19:43	07:08 18:49	13	07:48 (LZ16) 08:01 (LZ16)	06:47 16:59	16:00 (LZ15) 16:27 (LZ15)	07:25 16:33	
4	05:32 20:55	06:14 (LZ06) 06:37 (LZ06)	06:00 20:30	06:35 19:42	07:09 18:47	17	07:47 (LZ16) 08:04 (LZ16)	06:48 16:57	16:01 (LZ15) 16:26 (LZ15)	07:26 16:33	
5	05:33 20:55	06:14 (LZ06) 06:38 (LZ06)	06:01 20:29	06:36 19:40	07:11 18:45	19	07:45 (LZ16) 08:04 (LZ16)	06:50 16:56	16:02 (LZ15) 16:26 (LZ15)	07:27 16:33	
6	05:34 20:54	06:15 (LZ06) 06:38 (LZ06)	06:02 20:28	06:37 19:38	07:12 18:43	20	07:44 (LZ16) 08:04 (LZ16)	06:51 16:55	16:03 (LZ15) 16:24 (LZ15)	07:28 16:32	
7	05:34 20:54	06:14 (LZ06) 06:38 (LZ06)	06:04 20:26	06:39 19:36	07:13 18:42	22	07:43 (LZ16) 08:05 (LZ16)	06:52 16:54	16:05 (LZ15) 16:24 (LZ15)	07:29 16:32	
8	05:35 20:54	06:14 (LZ06) 06:39 (LZ06)	06:05 20:25	06:40 19:35	07:14 18:40	22	07:42 (LZ16) 08:04 (LZ16)	06:54 16:52	16:06 (LZ15) 16:22 (LZ15)	07:30 16:32	
9	05:36 20:53	06:15 (LZ06) 06:39 (LZ06)	06:06 20:24	06:41 19:33	07:15 18:38	22	07:43 (LZ16) 08:05 (LZ16)	06:55 16:51	16:08 (LZ15) 16:19 (LZ15)	07:31 16:32	
10	05:36 20:53	06:14 (LZ06) 06:39 (LZ06)	06:07 20:22	06:42 19:31	07:17 18:36	22	07:42 (LZ16) 08:04 (LZ16)	06:56 16:50	16:12 (LZ15) 16:16 (LZ15)	07:32 16:32	
11	05:37 20:52	06:14 (LZ06) 06:40 (LZ06)	06:08 20:21	06:43 19:29	07:18 18:35	21	07:42 (LZ16) 08:03 (LZ16)	06:57 16:49	16:11 (LZ15) 16:32	07:33 16:32	
12	05:38 20:52	06:15 (LZ06) 06:40 (LZ06)	06:09 20:19	06:44 19:27	07:19 18:33	19	07:43 (LZ16) 08:02 (LZ16)	06:59 16:48	16:12 (LZ15) 16:32	07:34 16:32	
13	05:39 20:51	06:15 (LZ06) 06:40 (LZ06)	06:10 20:18	06:45 19:25	07:20 18:31	18	07:44 (LZ16) 08:02 (LZ16)	07:00 16:47	16:13 (LZ15) 16:32	07:34 16:32	
14	05:39 20:51	06:14 (LZ06) 06:40 (LZ06)	06:11 20:17	06:46 19:24	07:21 18:29	15	07:45 (LZ16) 08:00 (LZ16)	07:01 16:46	16:14 (LZ15) 16:32	07:35 16:32	
15	05:40 20:50	06:15 (LZ06) 06:40 (LZ06)	06:13 20:15	06:48 19:22	07:23 18:28	11	07:46 (LZ16) 07:57 (LZ16)	07:03 16:45	16:15 (LZ15) 16:33	07:36 16:33	
16	05:41 20:49	06:15 (LZ06) 06:40 (LZ06)	06:14 20:13	06:49 19:20	07:24 18:26			07:04 16:44	16:16 (LZ15) 16:33	07:37 16:33	
17	05:42 20:49	06:15 (LZ06) 06:41 (LZ06)	06:15 20:12	06:50 19:18	07:25 18:24			07:05 16:43	16:17 (LZ15) 16:33	07:37 16:33	
18	05:43 20:48	06:16 (LZ06) 06:41 (LZ06)	06:16 20:10	06:51 19:16	07:26 18:23			07:07 16:42	16:18 (LZ15) 16:33	07:38 16:33	
19	05:44 20:47	06:16 (LZ06) 06:41 (LZ06)	06:17 20:09	06:52 19:14	07:28 18:21			07:08 16:41	16:19 (LZ15) 16:34	07:39 16:34	
20	05:45 20:46	06:16 (LZ06) 06:41 (LZ06)	06:18 20:07	06:53 19:13	07:29 18:19	7	17:12 (LZ15) 17:19 (LZ15)	07:09 16:40	16:20 (LZ15) 16:34	07:40 16:34	
21	05:46 20:45	06:17 (LZ06) 06:40 (LZ06)	06:19 20:06	06:54 19:11	07:30 18:18	14	17:08 (LZ15) 17:22 (LZ15)	07:10 16:40	16:21 (LZ15) 16:34	07:41 16:34	
22	05:47 20:45	06:17 (LZ06) 06:40 (LZ06)	06:20 20:04	06:55 19:09	07:31 18:16	18	17:05 (LZ15) 17:23 (LZ15)	07:12 16:39	16:22 (LZ15) 16:35	07:42 16:35	
23	05:48 20:44	06:17 (LZ06) 06:39 (LZ06)	06:22 20:02	06:57 19:07	07:33 18:15	21	17:04 (LZ15) 17:25 (LZ15)	07:13 16:38	16:23 (LZ15) 16:36	07:43 16:36	
24	05:49 20:43	06:18 (LZ06) 06:38 (LZ06)	06:23 20:01	06:58 19:05	07:34 18:13	24	17:02 (LZ15) 17:26 (LZ15)	07:14 16:37	16:24 (LZ15) 16:37	07:44 16:37	
25	05:50 20:42	06:18 (LZ06) 06:38 (LZ06)	06:24 19:59	06:59 19:03	06:35 17:12	25	16:01 (LZ15) 16:26 (LZ15)	07:15 16:37	16:25 (LZ15) 16:37	07:45 16:37	
26	05:51 20:41	06:19 (LZ06) 06:37 (LZ06)	06:25 19:57	07:00 19:01	06:36 17:10	26	16:01 (LZ15) 16:27 (LZ15)	07:17 16:36	16:26 (LZ15) 16:37	07:46 16:37	
27	05:52 20:40	06:20 (LZ06) 06:36 (LZ06)	06:26 19:56	07:01 19:00	06:38 17:09	27	16:00 (LZ15) 16:27 (LZ15)	07:18 16:36	16:27 (LZ15) 16:38	07:47 16:38	
28	05:53 20:39	06:22 (LZ06) 06:34 (LZ06)	06:27 19:54	07:02 18:58	06:39 17:07	28	16:00 (LZ15) 16:28 (LZ15)	07:19 16:35	16:28 (LZ15) 16:39	07:48 16:39	
29	05:54 20:38	06:24 (LZ06) 06:32 (LZ06)	06:28 19:52	07:04 18:56	06:40 17:06	29	15:59 (LZ15) 16:28 (LZ15)	07:20 16:35	16:29 (LZ15) 16:40	07:49 16:40	
30	05:55 20:36		06:29 19:51	07:05 18:54	06:42 17:04		15:59 (LZ15) 16:28 (LZ15)	07:21 16:34	16:30 (LZ15) 16:40	07:50 16:40	
31	05:56 20:35		06:31 19:49		06:43 17:03	28	16:00 (LZ15) 16:28 (LZ15)		16:31 (LZ15) 16:41	07:51 16:41	
Potential sun hours		468	434	376	342		291		278		
Total, worst case		648			525		203				
Sun reduction		0.59			0.47		0.36				
Oper. time red.		1.00			1.00		1.00				
Wind dir. red.		0.59			0.61		0.60				
Total reduction		0.35			0.29		0.22				
Total, real		226			150		44				

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_14 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 39.8° Slope: 90.0° (65)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March	April	May	June
1	07:44 16:42	07:28 17:19	06:48 17:57	07:16 (LZ16) 06:53	06:03 20:11	05:31 20:44
2	07:44 16:43	07:27 17:20	06:46 17:58	07:16 (LZ16) 06:51	06:02 20:12	06:05 (LZ06) 20:45
3	07:44 16:44	07:25 17:22	06:45 17:59	07:16 (LZ16) 06:49	06:00 20:14	06:04 (LZ06) 20:46
4	07:44 16:45	07:24 17:23	16:49 (LZ15) 16:52 (LZ15)	07:17 (LZ16) 06:48	05:59 20:15	06:04 (LZ06) 20:46
5	07:44 16:46	07:23 17:24	16:45 (LZ15) 16:56 (LZ15)	07:17 (LZ16) 06:46	05:57 20:16	06:04 (LZ06) 20:47
6	07:44 16:47	07:22 17:26	16:43 (LZ15) 16:59 (LZ15)	07:18 (LZ16) 06:44	05:56 20:17	06:05 (LZ06) 20:48
7	07:44 16:48	07:21 17:27	16:41 (LZ15) 17:00 (LZ15)	07:19 (LZ16) 06:42	05:55 20:18	06:04 (LZ06) 20:49
8	07:43 16:49	07:19 17:29	16:40 (LZ15) 17:01 (LZ15)	07:21 (LZ16) 06:40	05:53 20:19	06:05 (LZ06) 20:49
9	07:43 16:50	07:18 17:30	16:40 (LZ15) 17:02 (LZ15)	06:39 19:45	05:52 20:21	06:05 (LZ06) 20:50
10	07:43 16:51	07:17 17:31	16:39 (LZ15) 17:02 (LZ15)	06:37 19:46	05:51 20:22	06:05 (LZ06) 20:50
11	07:43 16:52	07:15 17:33	16:39 (LZ15) 17:03 (LZ15)	06:35 19:47	05:50 20:23	06:06 (LZ06) 20:51
12	07:42 16:53	07:14 17:34	16:39 (LZ15) 17:04 (LZ15)	06:33 19:48	05:49 20:24	06:05 (LZ06) 20:52
13	07:42 16:54	07:13 17:35	16:38 (LZ15) 17:04 (LZ15)	06:32 19:50	05:47 20:25	06:05 (LZ06) 20:52
14	07:42 16:56	07:11 17:37	16:39 (LZ15) 17:04 (LZ15)	06:30 19:51	05:46 20:26	06:05 (LZ06) 20:53
15	07:41 16:57	07:10 17:38	16:38 (LZ15) 17:04 (LZ15)	06:28 19:52	05:45 20:27	06:06 (LZ06) 20:53
16	07:41 16:58	07:08 17:40	16:39 (LZ15) 17:04 (LZ15)	06:27 19:53	05:44 20:28	06:06 (LZ06) 20:53
17	07:40 16:59	07:07 17:41	16:39 (LZ15) 17:03 (LZ15)	06:25 19:54	05:43 20:29	06:06 (LZ06) 20:54
18	07:39 17:00	07:06 17:42	16:40 (LZ15) 17:03 (LZ15)	06:23 19:56	05:42 20:31	06:07 (LZ06) 20:54
19	07:39 17:02	07:04 17:44	16:41 (LZ15) 17:01 (LZ15)	06:22 19:57	05:41 20:32	06:07 (LZ06) 20:55
20	07:38 17:03	07:02 17:45	16:42 (LZ15) 17:00 (LZ15)	06:20 19:58	05:40 20:33	06:07 (LZ06) 20:55
21	07:38 17:04	07:01 17:46	16:44 (LZ15) 16:58 (LZ15)	06:18 19:59	05:39 20:34	06:07 (LZ06) 20:55
22	07:37 17:06	06:59 17:48	07:24 (LZ16) 16:55 (LZ15)	06:17 20:00	05:38 20:35	06:07 (LZ06) 20:55
23	07:36 17:07	06:58 17:49	07:22 (LZ16) 07:37 (LZ16)	06:15 20:02	05:37 20:36	06:08 (LZ06) 20:55
24	07:35 17:08	06:56 17:50	07:20 (LZ16) 07:38 (LZ16)	06:14 20:03	05:36 20:37	06:08 (LZ06) 20:56
25	07:34 17:10	06:55 17:52	07:19 (LZ16) 07:40 (LZ16)	06:12 20:04	05:36 20:38	06:08 (LZ06) 20:56
26	07:34 17:11	06:53 17:53	07:18 (LZ16) 07:40 (LZ16)	06:11 20:05	05:35 20:39	06:08 (LZ06) 20:56
27	07:33 17:12	06:51 17:54	07:17 (LZ16) 07:40 (LZ16)	06:09 20:06	05:34 20:40	06:09 (LZ06) 20:56
28	07:32 17:14	06:50 17:56	07:17 (LZ16) 07:41 (LZ16)	06:07 20:08	05:33 20:40	06:09 (LZ06) 20:56
29	07:31 17:15			06:06 20:09	05:33 20:41	06:09 (LZ06) 20:56
30	07:30 17:16			06:05 20:10	05:32 20:42	06:09 (LZ06) 20:56
31	07:29 17:18			06:04 20:10	05:31 20:43	06:38 (LZ06) 20:56
Potential sun hours	289	293	369	402	456	462
Total, worst case		507	162		250	856
Sun reduction		0.29	0.31		0.47	0.49
Oper. time red.		1.00	1.00		1.00	1.00
Wind dir. red.		0.60	0.62		0.60	0.60
Total reduction		0.17	0.19		0.28	0.29
Total, real		89	31		70	252

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_14 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 39.8° Slope: 90.0° (65)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:56	06:10 (LZ06) 06:38 (LZ06)	05:57 20:34	06:32 19:47	07:06 18:52	06:44 17:01
2	05:31 20:55	06:09 (LZ06) 06:38 (LZ06)	05:58 20:33	06:33 19:45	07:07 18:51	06:46 17:00
3	05:32 20:55	06:10 (LZ06) 06:39 (LZ06)	05:59 20:32	06:34 19:43	07:08 18:49	06:47 16:59
4	05:32 20:55	06:10 (LZ06) 06:38 (LZ06)	06:00 20:30	06:35 19:42	07:09 18:47	06:48 16:57
5	05:33 20:55	06:10 (LZ06) 06:39 (LZ06)	06:01 20:29	06:36 19:40	07:11 18:45	06:50 16:56
6	05:33 20:54	06:11 (LZ06) 06:39 (LZ06)	06:02 20:28	06:37 19:38	07:12 18:43	06:51 16:55
7	05:34 20:54	06:11 (LZ06) 06:39 (LZ06)	06:04 20:26	06:39 19:36	07:13 18:42	06:52 16:54
8	05:35 20:54	06:11 (LZ06) 06:39 (LZ06)	06:05 20:25	06:40 19:35	07:14 18:40	06:54 16:52
9	05:36 20:53	06:12 (LZ06) 06:40 (LZ06)	06:06 20:24	06:41 19:33	07:15 18:38	06:55 16:51
10	05:36 20:53	06:11 (LZ06) 06:39 (LZ06)	06:07 20:22	06:42 19:31	07:17 18:36	06:56 16:50
11	05:37 20:52	06:12 (LZ06) 06:39 (LZ06)	06:08 20:21	06:43 19:29	07:18 18:35	06:57 16:49
12	05:38 20:52	06:12 (LZ06) 06:39 (LZ06)	06:09 20:19	06:44 19:27	07:19 18:33	06:59 16:48
13	05:39 20:51	06:13 (LZ06) 06:39 (LZ06)	06:10 20:18	06:45 19:25	07:20 18:31	07:00 16:47
14	05:39 20:51	06:13 (LZ06) 06:38 (LZ06)	06:11 20:17	06:46 19:24	07:21 18:29	07:01 16:46
15	05:40 20:50	06:13 (LZ06) 06:38 (LZ06)	06:12 20:15	06:48 19:22	07:23 18:28	07:03 16:45
16	05:41 20:49	06:14 (LZ06) 06:38 (LZ06)	06:14 20:13	06:49 19:20	07:24 18:26	07:04 16:44
17	05:42 20:49	06:15 (LZ06) 06:38 (LZ06)	06:15 20:12	06:50 19:18	07:25 18:24	07:05 16:43
18	05:43 20:48	06:16 (LZ06) 06:38 (LZ06)	06:16 20:10	06:51 19:16	07:26 18:23	07:07 16:42
19	05:44 20:47	06:16 (LZ06) 06:37 (LZ06)	06:17 20:09	06:52 19:14	07:28 18:21	07:08 16:41
20	05:45 20:46	06:17 (LZ06) 06:37 (LZ06)	06:18 20:07	06:53 19:13	07:29 18:19	07:09 16:40
21	05:46 20:45	06:18 (LZ06) 06:36 (LZ06)	06:19 20:06	06:54 19:11	07:30 18:18	07:10 16:40
22	05:47 20:45	06:20 (LZ06) 06:35 (LZ06)	06:20 20:04	06:55 19:09	07:31 18:16	07:12 16:39
23	05:48 20:44	06:21 (LZ06) 06:32 (LZ06)	06:22 20:02	06:57 19:07	07:33 18:15	07:13 16:38
24	05:49 20:43	06:23 (LZ06) 06:30 (LZ06)	06:23 20:01	06:58 19:05	07:34 18:13	07:14 16:37
25	05:50 20:42		06:24 19:59	06:59 19:03	06:35 17:12	07:15 16:37
26	05:51 20:41		06:25 19:57	07:00 19:01	06:36 17:10	07:17 16:36
27	05:52 20:40		06:26 19:56	07:01 19:00	06:38 17:09	07:18 16:36
28	05:53 20:39		06:27 19:54	07:02 18:58	06:39 17:07	07:19 16:35
29	05:54 20:38		06:28 19:52	07:04 18:56	06:40 17:06	07:20 16:35
30	05:55 20:36		06:29 19:50	07:05 18:54	06:42 17:04	07:21 16:34
31	05:56 20:35		06:31 19:49	06:43 17:03	06:09 16:33	07:43 16:41
Potential sun hours	468	434	376	342	291	278
Total, worst case	574			563	110	
Sun reduction	0.59			0.47	0.36	
Oper. time red.	1.00			1.00	1.00	
Wind dir. red.	0.60			0.61	0.60	
Total reduction	0.35			0.29	0.22	
Total, real	201			162	24	

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		





SHADOW - Calendar

Calculation: Real Case Shadow receptor: KrU_15 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -60.9° Slope: 90.0° (66)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March	April	May	June	July	August	September	October	November	December				
1	07:44	07:28	06:48	07:16 (LZ16)	06:53	06:03	05:31	05:31	05:57	06:32	07:06	07:53 (LZ16)	06:44	07:22		
	16:42	17:19	17:57	41 17:20 (LZ15)	19:35	20:11	20:44	20:56	20:34	19:47	18:52	21 08:14 (LZ16)	17:01	16:34		
2	07:44	07:27	06:46	07:15 (LZ16)	06:51	06:02	05:30	05:31	05:58	06:33	07:07	07:52 (LZ16)	06:46	07:24		
	16:43	17:20	17:58	40 17:18 (LZ15)	19:36	20:12	20:45	20:55	20:33	19:45	18:51	23 08:15 (LZ16)	17:00	16:33		
3	07:44	07:25	06:45	07:14 (LZ16)	06:49	06:00	05:30	05:32	05:59	06:34	07:08	07:50 (LZ16)	06:47	07:25		
	16:44	17:22	17:59	38 17:16 (LZ15)	19:38	20:14	20:46	20:55	20:32	19:43	18:49	25 08:15 (LZ16)	16:59	16:33		
4	07:44	07:24	06:43	07:14 (LZ16)	06:48	05:59	05:29	05:32	06:00	06:35	07:09	07:50 (LZ16)	06:48	07:26		
	16:45	17:23	18:01	33 17:14 (LZ15)	19:39	20:15	20:46	20:55	20:30	19:42	18:47	27 08:17 (LZ16)	16:57	16:33		
5	07:44	07:23	06:41	07:13 (LZ16)	06:46	05:57	05:29	05:33	06:01	06:36	07:11	07:49 (LZ16)	06:50	07:27		
	16:46	17:24	18:02	27 07:40 (LZ16)	19:40	20:16	20:47	20:55	20:29	19:40	18:45	27 08:16 (LZ16)	16:56	16:33		
6	07:44	07:22	06:40	07:12 (LZ16)	06:44	05:56	05:29	05:33	06:02	06:37	07:12	07:48 (LZ16)	06:51	07:28		
	16:47	17:26	18:03	28 07:40 (LZ16)	19:41	20:17	20:48	20:54	20:28	19:38	18:43	28 08:16 (LZ16)	16:55	16:32		
7	07:44	07:21	06:38	07:12 (LZ16)	06:42	05:55	05:28	05:34	06:04	06:39	07:13	07:48 (LZ16)	06:52	07:29		
	16:48	17:27	18:05	28 07:40 (LZ16)	19:42	20:18	20:49	20:54	20:26	19:36	18:42	28 08:16 (LZ16)	16:54	16:32		
8	07:43	07:19	06:36	07:12 (LZ16)	06:40	05:53	05:28	05:35	06:05	06:40	07:14	07:47 (LZ16)	06:53	07:30		
	16:49	17:29	18:06	28 07:40 (LZ16)	19:44	20:19	20:49	20:54	20:25	19:35	18:40	28 08:15 (LZ16)	16:52	16:32		
9	07:43	07:18	06:34	07:12 (LZ16)	06:39	05:52	05:28	05:36	06:06	06:41	07:15	07:48 (LZ16)	06:55	07:31		
	16:50	17:30	18:07	27 07:39 (LZ16)	19:45	20:20	20:50	20:53	20:24	19:33	18:38	27 08:15 (LZ16)	16:51	16:32		
10	07:43	07:17	06:33	07:12 (LZ16)	06:37	05:51	05:27	05:36	06:07	06:42	07:17	07:48 (LZ16)	06:56	07:32		
	16:51	17:31	18:08	26 07:38 (LZ16)	19:46	20:22	20:50	20:53	20:22	19:31	18:36	38 17:50 (LZ15)	16:50	16:32		
11	07:43	07:15	06:31	07:13 (LZ16)	06:35	05:50	05:27	05:37	06:08	06:43	07:18	07:48 (LZ16)	06:57	07:33		
	16:52	17:33	18:10	24 07:37 (LZ16)	19:47	20:23	20:51	20:52	20:21	19:29	18:35	40 17:51 (LZ15)	16:49	16:32		
12	07:42	07:14	06:29	07:13 (LZ16)	06:33	05:49	05:27	05:38	06:09	06:44	07:19	07:49 (LZ16)	06:59	07:33		
	16:53	17:34	18:11	22 07:35 (LZ16)	19:48	20:24	20:52	20:52	20:19	19:27	18:33	41 17:52 (LZ15)	16:48	16:32		
13	07:42	07:13	06:27	07:15 (LZ16)	06:32	05:47	05:27	05:39	06:10	06:45	07:20	07:50 (LZ16)	07:00	07:34		
	16:54	17:35	18:12	19 07:34 (LZ16)	19:50	20:25	20:52	20:51	20:18	19:25	18:31	41 17:54 (LZ15)	16:47	16:32		
14	07:42	07:11	06:25	07:17 (LZ16)	06:30	05:46	05:27	05:39	06:11	06:46	07:21	07:51 (LZ16)	07:01	07:35		
	16:56	17:37	18:13	15 07:32 (LZ16)	19:51	20:26	20:53	20:51	20:17	19:24	18:29	39 17:54 (LZ15)	16:46	16:32		
15	07:41	07:10	06:24	07:19 (LZ16)	06:28	05:45	05:27	05:40	06:12	06:48	07:23	07:53 (LZ16)	07:03	07:36		
	16:57	17:38	18:15	9 07:28 (LZ16)	19:52	20:27	20:53	20:50	20:15	19:22	18:28	36 17:54 (LZ15)	16:45	16:32		
16	07:41	07:08	06:22		06:27	05:44	05:27	05:41	06:14	06:49	07:24	07:57 (LZ16)	07:04	07:37		
	16:58	17:40	18:16		19:53	20:28	20:53	20:49	20:13	19:20	18:26	28 17:54 (LZ15)	16:44	16:33		
17	07:40	07:07	06:20		06:25	05:43	05:27	05:42	06:15	06:50	07:25	17:31 (LZ15)	07:05	07:37		
	16:59	17:41	18:17		19:54	20:29	20:54	20:49	20:12	19:18	18:24	23 17:54 (LZ15)	16:43	16:33		
18	07:39	07:06		17:06 (LZ15)	06:18	06:23	05:42	05:27	05:43	06:16	06:51	17:26	17:31 (LZ15)	07:07	07:38	
	17:00	17:42	11 17:17 (LZ15)	18:18	19:56	20:31	20:54	20:48	20:10	19:16	18:22	23 17:54 (LZ15)	16:42	16:33		
19	07:39	07:04		17:04 (LZ15)	06:16	06:22	05:41	05:27	05:44	06:17	06:52	17:28	17:31 (LZ15)	07:08	07:39	
	17:02	17:44	15 17:19 (LZ15)	18:19	19:57	20:32	20:54	20:47	20:09	19:14	18:21	22 17:53 (LZ15)	16:41	16:34		
20	07:38	07:02		17:03 (LZ15)	06:15	06:20	05:40	05:27	05:45	06:18	06:53	17:29	17:32 (LZ15)	07:09	07:39	
	17:03	17:45	18 17:21 (LZ15)	18:21	19:58	20:33	20:55	20:46	20:07	19:13	18:19	21 17:53 (LZ15)	16:40	16:34		
21	07:37	07:01		17:01 (LZ15)	06:13	06:18	05:39	05:27	05:46	06:19	06:54	17:30	17:32 (LZ15)	07:10	07:40	
	17:04	17:46	20 17:21 (LZ15)	18:22	19:59	20:34	20:55	20:45	20:06	19:11	18:18	19 17:51 (LZ15)	16:40	16:34		
22	07:37	06:59		17:00 (LZ15)	06:11	06:17	05:38	05:27	05:47	06:20	06:55	17:31	17:33 (LZ15)	07:12	07:40	
	17:06	17:48	21 17:21 (LZ15)	18:23	20:00	20:35	20:55	20:45	20:04	19:09	18:16	17 17:50 (LZ15)	16:39	16:35		
23	07:36	06:58		17:00 (LZ15)	06:09	06:15	05:37	05:28	05:48	06:22	06:57	17:33	17:35 (LZ15)	07:13	07:41	
	17:07	17:49	22 17:22 (LZ15)	18:24	20:02	20:36	20:55	20:44	20:02	19:07	18:15	14 17:49 (LZ15)	16:38	16:35		
24	07:35	06:56		16:59 (LZ15)	06:07	06:14	05:36	05:28	05:49	06:23	06:58	17:34	17:37 (LZ15)	07:14	07:41	
	17:08	17:50	23 17:22 (LZ15)	18:26	20:03	20:37	20:56	20:43	20:01	19:05	18:13	9 17:46 (LZ15)	16:37	16:36		
25	07:34	06:55		17:00 (LZ15)	06:06	06:12	05:36	05:28	05:50	06:24	06:59	17:35		07:15	07:42	
	17:10	17:52	23 17:23 (LZ15)	18:27	20:04	20:38	20:56	20:42	19:59	19:03	17:12			16:37	16:37	
26	07:34	06:53		07:23 (LZ16)	06:04	06:11	05:35	05:28	05:51	06:25	07:00	17:12		07:17	07:42	
	17:11	17:53	32 17:22 (LZ15)	18:28	20:05	20:39	20:56	20:41	19:57	19:01	17:10			16:36	16:37	
27	07:33	06:51		07:20 (LZ16)	06:02	06:09	05:34	05:29	05:52	06:26	07:01	17:09		07:18	07:43	
	17:12	17:54	37 17:21 (LZ15)	18:29	20:06	20:40	20:56	20:40	19:56	19:00	17:09			16:36	16:38	
28	07:32	06:50		07:18 (LZ16)	06:00	06:07	05:33	05:29	05:53	06:27	07:02		08:02 (LZ16)	06:39	07:19	07:43
	17:14	17:56	40 17:21 (LZ15)	18:30	20:08	20:40	20:56	20:39	19:54	18:58	4 08:06 (LZ16)	17:07		16:35	16:39	
29	07:31			06:58	06:06	05:33	05:30	05:54	06:28	07:04	07:58 (LZ16)	06:40		07:20	07:43	
	17:15			19:32	20:09	20:41	20:56	20:38	19:52	18:56	13 08:11 (LZ16)	17:06		16:35	16:39	
30	07:30			06:57	06:05	05:32	05:30	05:55	06:29	07:05	07:55 (LZ16)	06:42		07:21	07:43	
	17:16			19:33	20:10	20:42	20:56	20:36	19:50	18:54	18 08:13 (LZ16)	17:04		16:34	16:40	
31	07:29			06:55		05:31		05:56	06:31			06:43		07:43		
	17:18			19:34		20:43		20:35	19:49			17:03		16:41		
Potential sun hours	289	293	369		402	456	462	468	434	376		342		291	278	
Total, worst case		262		405						35		645				
Sun reduction		0.29		0.31						0.59		0.47				
Oper. time red.		1.00		1.00						1.00		1.00				
Wind dir. red.		0.59		0.61						0.61		0.60				
Total reduction		0.17		0.19						0.36		0.28				
Total, real		45		75						13		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)	Minutes with flicker	Last time (hh:mm) with flicker
			(WTG causing flicker last time)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: LoZ_01 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -111.8° Slope: 90.0° (54)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2.61 3.03 3.64 5.32 6.89 7.61 8.86 9.04 7.43 5.21 3.54 2.37

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
1,100 811 599 537 466 626 951 657 457 913 862 781 8,760

January			February			March			April			May			June		
1	07:44		08:48 (LZ66)	07:28		06:48		07:17 (LZ64)	06:53		06:03		05:31				
	16:42	5	08:53 (LZ66)	17:19		17:57	21	07:38 (LZ64)	19:35		20:11		20:44				
2	07:44			07:27		06:46		07:17 (LZ64)	06:51		06:02		05:31				
	16:43			17:21		17:58	21	07:38 (LZ64)	19:37		20:12		20:45				
3	07:44			07:25		06:45		07:17 (LZ64)	06:49		06:00		05:30				
	16:44			17:22		18:00	20	07:37 (LZ64)	19:38		20:14		20:46				
4	07:44			07:24		06:43		07:19 (LZ64)	06:48		05:59		05:30				
	16:45			17:23		18:01	17	07:36 (LZ64)	19:39		20:15		20:46				
5	07:44			07:23		06:41		07:19 (LZ64)	06:46		05:58		05:29				
	16:46			17:25		18:02	15	07:34 (LZ64)	19:40		20:16		20:47				
6	07:44			07:22		06:40		07:21 (LZ64)	06:44		05:56		05:29				
	16:47			17:26		18:03	21	07:42 (LZ65)	19:41		20:17		20:48				
7	07:44			07:21		06:38		07:24 (LZ65)	06:42		05:55		05:28				
	16:48			17:27		18:05	21	07:45 (LZ65)	19:43		20:18		20:48				
8	07:43			07:19		06:36		07:22 (LZ65)	06:41		05:54		05:28				
	16:49			17:29		18:06	25	07:47 (LZ65)	19:44		20:19		20:49				
9	07:43			07:18		06:34		07:20 (LZ65)	06:39		05:52		05:28				
	16:50			17:30		18:07	29	07:49 (LZ65)	19:45		20:21		20:50				
10	07:43			07:17		06:33		07:18 (LZ65)	06:37		05:51		05:28				
	16:51			17:32		18:08	32	07:50 (LZ65)	19:46		20:22		20:50				
11	07:43			07:16		06:31		07:16 (LZ65)	06:35		05:50		05:27				
	16:52			17:33		18:10	34	07:50 (LZ65)	19:47		20:23		20:51				
12	07:42			07:14		06:29		07:15 (LZ65)	06:34		05:49		05:27				
	16:53			17:34		18:11	37	07:52 (LZ65)	19:48		20:24		20:52				
13	07:42			07:13		06:27		07:14 (LZ65)	06:32		05:48		05:27				
	16:55			17:36		18:12	38	07:52 (LZ65)	19:50		20:25		20:52				
14	07:41			07:11		06:26		07:13 (LZ65)	06:30		05:46		05:27				
	16:56			17:37		18:13	39	07:52 (LZ65)	19:51		20:26		20:53				
15	07:41			07:10		06:24		07:12 (LZ65)	06:29		05:45		05:27				
	16:57			17:38		18:15	40	07:52 (LZ65)	19:52		20:27		20:53				
16	07:41			07:09		06:22		07:11 (LZ65)	06:27		05:44		05:27				
	16:58			17:40		18:16	41	07:52 (LZ65)	19:53		20:28		20:53				
17	07:40			07:07		06:20		07:12 (LZ65)	06:25		05:43		05:27				
	16:59			17:41		18:17	41	07:53 (LZ65)	19:54		20:29		20:54				
18	07:39			07:06		06:18		07:11 (LZ65)	06:24		05:42		05:27				
	17:01			17:42		18:18	41	07:52 (LZ65)	19:56		20:30		20:54				
19	07:39			07:04		06:17		07:10 (LZ65)	06:22		05:41		05:27				
	17:02			17:44		18:20	42	07:52 (LZ65)	19:57		20:32		20:54				
20	07:38			07:03		06:15		07:10 (LZ65)	06:20		05:40		05:27				
	17:03			17:45		18:21	41	07:51 (LZ65)	19:58		20:33		20:55				
21	07:37			07:01		06:13		07:10 (LZ65)	06:19		05:39		05:27				
	17:05			17:46		18:22	40	07:50 (LZ65)	19:59		20:34		20:55				
22	07:37			06:59		07:24 (LZ64)	06:11	07:10 (LZ65)	06:17		05:38		05:28				
	17:06			17:48	9	07:33 (LZ64)	18:23	07:49 (LZ65)	20:00		20:35		20:55				
23	07:36			06:58		07:22 (LZ64)	06:09	07:11 (LZ65)	06:15		05:37		05:28				
	17:07			17:49	14	07:36 (LZ64)	18:24	07:49 (LZ65)	20:02		20:36		20:55				
24	07:35			06:56		07:20 (LZ64)	06:08	07:11 (LZ65)	06:14		05:37		05:28				
	17:08			17:50	17	07:37 (LZ64)	18:26	07:48 (LZ65)	20:03		20:37		20:56				
25	07:34			06:55		07:20 (LZ64)	06:06	07:11 (LZ65)	06:12		05:36		05:28				
	17:10			17:52	18	07:38 (LZ64)	18:27	07:46 (LZ65)	20:04		20:38		20:56				
26	07:34			06:53		07:18 (LZ64)	06:04	07:12 (LZ65)	06:11		05:35		05:29				
	17:11			17:53	20	07:38 (LZ64)	18:28	07:45 (LZ65)	20:05		20:39		20:56				
27	07:33			06:51		07:18 (LZ64)	06:02	07:12 (LZ65)	06:09		05:34		05:29				
	17:12			17:54	20	07:38 (LZ64)	18:29	07:43 (LZ65)	20:06		20:40		20:56				
28	07:32			06:50		07:18 (LZ64)	06:00	07:14 (LZ65)	06:08		05:34		05:29				
	17:14			17:56	21	07:39 (LZ64)	18:30	07:42 (LZ65)	20:08		20:40		20:56				
29	07:31					06:58		08:16 (LZ65)	06:06		05:33		05:30				
	17:15					19:32	23	08:39 (LZ65)	20:09		20:41		20:56				
30	07:30					06:57		08:18 (LZ65)	06:05		05:32		05:30				
	17:16					19:33	18	08:36 (LZ65)	20:10		20:42		20:56				
31	07:29					06:55		08:21 (LZ65)			05:32						
	17:18					19:34	11	08:32 (LZ65)			20:43						
Potential sun hours	289			293		369		402			456		462				
Total, worst case	5			119		949											
Sun reduction	0.28			0.29		0.31											
Oper. time red.	1.00			1.00		1.00											
Wind dir. red.	0.66			0.62		0.61											
Total reduction	0.19			0.18		0.19											
Total, real	1			21		178											

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: LoZ_01 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -111.8° Slope: 90.0° (54)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:55	05:57 20:34	06:32 19:47	07:06 18:52	07:54 (LZ65) 18:31 (LZ65)	06:44 17:02
2	05:31 20:55	05:58 20:33	06:33 19:45	07:07 18:51	07:54 (LZ65) 08:29 (LZ65)	06:46 17:00
3	05:32 20:55	05:59 20:32	06:34 19:44	07:08 18:49	07:55 (LZ65) 08:28 (LZ65)	06:47 16:59
4	05:33 20:55	06:00 20:30	06:35 19:42	07:09 18:47	07:57 (LZ65) 08:27 (LZ65)	06:48 16:58
5	05:33 20:55	06:02 20:29	06:36 19:40	07:11 18:45	07:58 (LZ65) 08:25 (LZ65)	06:50 16:56
6	05:34 20:54	06:03 20:28	06:38 19:38	07:12 18:43	07:59 (LZ65) 08:23 (LZ65)	06:51 16:55
7	05:34 20:54	06:04 20:26	06:39 19:36	07:13 18:42	07:58 (LZ64) 08:19 (LZ65)	06:52 16:54
8	05:35 20:54	06:05 20:25	06:40 19:35	07:14 18:40	07:55 (LZ64) 08:14 (LZ65)	06:54 16:53
9	05:36 20:53	06:06 20:24	06:41 19:33	07:15 18:38	07:54 (LZ64) 08:10 (LZ64)	06:55 16:51
10	05:37 20:53	06:07 20:22	06:42 19:31	07:17 18:36	07:53 (LZ64) 08:11 (LZ64)	06:56 16:50
11	05:37 20:52	06:08 20:21	06:43 19:29	07:18 18:35	07:51 (LZ64) 08:11 (LZ64)	06:57 16:49
12	05:38 20:52	06:09 20:19	06:44 19:27	08:14 (LZ65) 08:23 (LZ65)	07:19 18:33	06:59 16:48
13	05:39 20:51	06:10 20:18	06:45 19:25	08:09 (LZ65) 08:27 (LZ65)	07:20 18:31	07:00 16:47
14	05:40 20:51	06:12 20:17	06:47 19:24	08:06 (LZ65) 08:29 (LZ65)	07:21 18:30	07:01 16:46
15	05:41 20:50	06:13 20:15	06:48 19:22	08:04 (LZ65) 08:31 (LZ65)	07:23 18:28	07:03 16:45
16	05:41 20:49	06:14 20:14	06:49 19:20	08:02 (LZ65) 08:32 (LZ65)	07:24 18:26	07:04 16:44
17	05:42 20:49	06:15 20:12	06:50 19:18	08:00 (LZ65) 08:33 (LZ65)	07:25 18:25	07:05 16:43
18	05:43 20:48	06:16 20:10	06:51 19:16	07:59 (LZ65) 08:34 (LZ65)	07:26 18:23	07:07 16:42
19	05:44 20:47	06:17 20:09	06:52 19:14	07:57 (LZ65) 08:34 (LZ65)	07:28 18:21	07:08 16:41
20	05:45 20:46	06:18 20:07	06:53 19:13	07:57 (LZ65) 08:35 (LZ65)	07:29 18:20	07:09 16:41
21	05:46 20:45	06:19 20:06	06:54 19:11	07:56 (LZ65) 08:35 (LZ65)	07:30 18:18	07:10 16:40
22	05:47 20:44	06:21 20:04	06:56 19:09	07:55 (LZ65) 08:35 (LZ65)	07:31 18:16	07:12 16:39
23	05:48 20:44	06:22 20:02	06:57 19:07	07:55 (LZ65) 08:35 (LZ65)	07:33 18:15	07:13 16:38
24	05:49 20:43	06:23 20:01	06:58 19:05	07:54 (LZ65) 08:35 (LZ65)	07:34 18:13	07:14 16:38
25	05:50 20:42	06:24 19:59	06:59 19:03	07:53 (LZ65) 08:35 (LZ65)	06:35 17:12	07:15 16:37
26	05:51 20:41	06:25 19:57	07:00 19:02	07:53 (LZ65) 08:34 (LZ65)	06:37 17:10	07:17 16:36
27	05:52 20:40	06:26 19:56	07:01 19:00	07:53 (LZ65) 08:34 (LZ65)	06:38 17:09	07:18 16:36
28	05:53 20:39	06:27 19:54	07:02 18:58	07:54 (LZ65) 08:34 (LZ65)	06:39 17:07	07:19 16:35
29	05:54 20:37	06:29 19:52	07:04 18:56	07:53 (LZ65) 08:33 (LZ65)	06:40 17:06	07:20 16:35
30	05:55 20:36	06:30 19:51	07:05 18:54	07:54 (LZ65) 08:32 (LZ65)	06:42 17:04	07:21 16:34
31	05:56 20:35	06:31 19:49		06:43 17:03		07:43 16:41
Potential sun hours	468	433	376	342	291	279
Total, worst case			652	438		233
Sun reduction			0.59	0.47		0.26
Oper. time red.			1.00	1.00		1.00
Wind dir. red.			0.61	0.62		0.66
Total reduction			0.36	0.29		0.17
Total, real			237	127		41

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: LoZ_02 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -98.1° Slope: 90.0° (55)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

January			February			March			April			May			June		
1	07:44		08:20 (LZ66)	07:28	06:48				06:53			06:03		07:04 (LZ65)	05:31		
	16:42	22	08:42 (LZ66)	17:19	17:57				19:35			20:11	46	07:50 (LZ65)	20:44		
2	07:44		08:20 (LZ66)	07:27	06:46				06:51			06:02		07:04 (LZ65)	05:31		
	16:43	23	08:43 (LZ66)	17:21	17:58				19:36			20:12	46	07:50 (LZ65)	20:45		
3	07:44		08:20 (LZ66)	07:25	06:45				06:49			06:00		07:05 (LZ65)	05:30		
	16:44	24	08:44 (LZ66)	17:22	18:00				19:38			20:14	45	07:50 (LZ65)	20:46		
4	07:44		08:19 (LZ66)	07:24	06:43				06:48			05:59		07:04 (LZ65)	05:30		
	16:45	24	08:43 (LZ66)	17:23	18:01				19:39			20:15	45	07:49 (LZ65)	20:46		
5	07:44		08:20 (LZ66)	07:23	06:41				06:46			05:58		07:05 (LZ65)	05:29		
	16:46	24	08:44 (LZ66)	17:25	18:02				19:40			20:16	44	07:49 (LZ65)	20:47		
6	07:44		08:20 (LZ66)	07:22	06:40				06:44			05:56		07:05 (LZ65)	05:29		
	16:47	25	08:45 (LZ66)	17:26	18:03				19:41			20:17	43	07:48 (LZ65)	20:48		
7	07:44		08:20 (LZ66)	07:21	06:38				06:42			05:55		07:06 (LZ65)	05:28		
	16:48	26	08:46 (LZ66)	17:27	18:05				19:42			20:18	42	07:48 (LZ65)	20:48		
8	07:43		08:21 (LZ66)	07:19	06:36				06:41			05:54		07:06 (LZ65)	05:28		
	16:49	26	08:47 (LZ66)	17:29	18:06				19:44			20:19	40	07:46 (LZ65)	20:49		
9	07:43		08:20 (LZ66)	07:18	06:34				06:39			05:52		07:07 (LZ65)	05:28		
	16:50	27	08:47 (LZ66)	17:30	18:07				19:45			20:20	39	07:46 (LZ65)	20:50		
10	07:43		08:21 (LZ66)	07:17	06:33				06:37			05:51		07:07 (LZ65)	05:28		
	16:51	27	08:48 (LZ66)	17:32	18:08				19:46			20:22	38	07:45 (LZ65)	20:50		
11	07:43		08:22 (LZ66)	07:16	06:31			06:56 (LZ64)	06:35			05:50		07:08 (LZ65)	05:27		
	16:52	27	08:49 (LZ66)	17:33	18:10	8		07:04 (LZ64)	19:47			20:23	36	07:44 (LZ65)	20:51		
12	07:42		08:21 (LZ66)	07:14	06:29			06:54 (LZ64)	06:34			07:29 (LZ65)	05:49	07:09 (LZ65)	05:27		
	16:53	28	08:49 (LZ66)	17:34	18:11	14		07:08 (LZ64)	19:48	7		07:36 (LZ65)	20:24	07:43 (LZ65)	20:51		
13	07:42		08:22 (LZ66)	07:13	06:27			06:52 (LZ64)	06:32			07:23 (LZ65)	05:48	07:10 (LZ65)	05:27		
	16:55	28	08:50 (LZ66)	17:36	18:12	17		07:09 (LZ64)	19:50	18		07:41 (LZ65)	20:25	07:42 (LZ65)	20:52		
14	07:41		08:22 (LZ66)	07:11	06:26			06:50 (LZ64)	06:30			07:20 (LZ65)	05:46	07:11 (LZ65)	05:27		
	16:56	27	08:49 (LZ66)	17:37	18:13	20		07:10 (LZ64)	19:51	24		07:44 (LZ65)	20:26	07:41 (LZ65)	20:52		
15	07:41		08:23 (LZ66)	07:10	06:24			06:49 (LZ64)	06:29			07:17 (LZ65)	05:45	07:13 (LZ65)	05:27		
	16:57	27	08:50 (LZ66)	17:38	18:15	21		07:10 (LZ64)	19:52	28		07:45 (LZ65)	20:27	07:40 (LZ65)	20:53		
16	07:41		08:23 (LZ66)	07:08	06:22			06:48 (LZ64)	06:27			07:15 (LZ65)	05:44	07:14 (LZ65)	05:27		
	16:58	27	08:50 (LZ66)	17:40	18:16	22		07:10 (LZ64)	19:53	32		07:47 (LZ65)	20:28	07:39 (LZ65)	20:53		
17	07:40		08:23 (LZ66)	07:07	06:20			06:48 (LZ64)	06:25			07:14 (LZ65)	05:43	07:15 (LZ65)	05:27		
	16:59	27	08:50 (LZ66)	17:41	18:17	23		07:11 (LZ64)	19:54	34		07:48 (LZ65)	20:29	07:37 (LZ65)	20:54		
18	07:39		08:24 (LZ66)	07:06	06:18			06:48 (LZ64)	06:24			07:12 (LZ65)	05:42	07:17 (LZ65)	05:27		
	17:01	27	08:51 (LZ66)	17:42	18:18	22		07:10 (LZ64)	19:56	37		07:49 (LZ65)	20:30	07:35 (LZ65)	20:54		
19	07:39		08:24 (LZ66)	07:04	06:17			06:47 (LZ64)	06:22			07:10 (LZ65)	05:41	07:20 (LZ65)	05:27		
	17:02	27	08:51 (LZ66)	17:44	18:20	22		07:09 (LZ64)	19:57	39		07:49 (LZ65)	20:32	07:32 (LZ65)	20:54		
20	07:38		08:24 (LZ66)	07:03	06:15			06:47 (LZ64)	06:20			07:10 (LZ65)	05:40	07:25 (LZ65)	05:27		
	17:03	27	08:51 (LZ66)	17:45	18:21	22		07:09 (LZ64)	19:58	41		07:51 (LZ65)	20:33	07:27 (LZ65)	20:55		
21	07:37		08:26 (LZ66)	07:01	06:13			06:48 (LZ64)	06:19			07:08 (LZ65)	05:39		05:27		
	17:05	25	08:51 (LZ66)	17:46	18:22	19		07:07 (LZ64)	19:59	43		07:51 (LZ65)	20:34		20:55		
22	07:37		08:26 (LZ66)	06:59	06:11			06:48 (LZ64)	06:17			07:08 (LZ65)	05:38		05:28		
	17:06	25	08:51 (LZ66)	17:48	18:23	18		07:06 (LZ64)	20:00	44		07:52 (LZ65)	20:35		20:55		
23	07:36		08:27 (LZ66)	06:58	06:09			06:50 (LZ64)	06:15			07:07 (LZ65)	05:37		05:28		
	17:07	23	08:50 (LZ66)	17:49	18:24	15		07:05 (LZ64)	20:02	44		07:51 (LZ65)	20:36		20:55		
24	07:35		08:28 (LZ66)	06:56	06:08			06:52 (LZ64)	06:14			07:07 (LZ65)	05:37		05:28		
	17:08	22	08:50 (LZ66)	17:50	18:26	10		07:02 (LZ64)	20:03	45		07:52 (LZ65)	20:37		20:55		
25	07:34		08:29 (LZ66)	06:55	06:06				06:12			07:06 (LZ65)	05:36		05:28		
	17:10	20	08:49 (LZ66)	17:52	18:27				20:04	46		07:52 (LZ65)	20:38		20:56		
26	07:34		08:30 (LZ66)	06:53	06:04				06:11			07:06 (LZ65)	05:35		05:29		
	17:11	18	08:48 (LZ66)	17:53	18:28				20:05	46		07:52 (LZ65)	20:39		20:56		
27	07:33		08:32 (LZ66)	06:51	06:02				06:09			07:05 (LZ65)	05:34		05:29		
	17:12	15	08:47 (LZ66)	17:54	18:29				20:06	46		07:51 (LZ65)	20:39		20:56		
28	07:32		08:34 (LZ66)	06:50	06:00				06:08			07:05 (LZ65)	05:34		05:30		
	17:14	11	08:45 (LZ66)	17:56	18:30				20:08	47		07:52 (LZ65)	20:40		20:56		
29	07:31		08:38 (LZ66)		06:58				06:06			07:04 (LZ65)	05:33		05:30		
	17:15	3	08:41 (LZ66)		19:32				20:09	47		07:51 (LZ65)	20:41		20:56		
30	07:30				06:57				06:05			07:05 (LZ65)	05:32		05:30		
	17:16				19:33				20:10	46		07:51 (LZ65)	20:42		20:56		
31	07:29				06:55							05:32					
	17:18				19:34							20:43					
Potential sun hours	289			293	369			402				456			462		
Total, worst case		682			253			714				666					
Sun reduction		0.28			0.31			0.40				0.47					
Oper. time red.		1.00			1.00			1.00				1.00					
Wind dir. red.		0.67			0.62			0.59				0.59					
Total reduction		0.19			0.19			0.24				0.28					
Total, real		127			48			168				185					

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: LoZ_02 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -98.1° Slope: 90.0° (55)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

July		August		September		October		November		December	
1	05:31	05:57	07:19 (LZ65)	06:32		07:06	07:32 (LZ64)	06:44		07:22	08:04 (LZ66)
	20:55	20:34	07:54 (LZ65)	19:47		18:52	07:47 (LZ64)	17:02		16:34	08:31 (LZ66)
2	05:31	05:58	07:19 (LZ65)	06:33		07:07	07:34 (LZ64)	06:46		07:24	08:04 (LZ66)
	20:55	20:33	07:55 (LZ65)	19:45		18:51	07:44 (LZ64)	17:00		16:34	08:31 (LZ66)
3	05:32	05:59	07:18 (LZ65)	06:34		07:08		06:47		07:25	08:04 (LZ66)
	20:55	20:32	07:56 (LZ65)	19:44		18:49		16:59		16:33	08:31 (LZ66)
4	05:33	06:00	07:17 (LZ65)	06:35		07:09		06:48		07:26	08:05 (LZ66)
	20:55	20:30	07:57 (LZ65)	19:42		18:47		16:58		16:33	08:31 (LZ66)
5	05:33	06:02	07:16 (LZ65)	06:36		07:11		06:50		07:27	08:05 (LZ66)
	20:55	20:29	07:57 (LZ65)	19:40		18:45		16:56		16:33	08:31 (LZ66)
6	05:34	06:03	07:16 (LZ65)	06:38		07:12		06:51		07:28	08:06 (LZ66)
	20:54	20:28	07:58 (LZ65)	19:38		18:43		16:55		16:33	08:31 (LZ66)
7	05:34	06:04	07:15 (LZ65)	06:39		07:13		06:52		07:29	08:07 (LZ66)
	20:54	20:26	07:58 (LZ65)	19:36		18:42		16:54		16:32	08:31 (LZ66)
8	05:35	06:05	07:14 (LZ65)	06:40		07:14		06:54		07:30	08:07 (LZ66)
	20:54	20:25	07:58 (LZ65)	19:35		18:40		16:53		16:32	08:31 (LZ66)
9	05:36	06:06	07:14 (LZ65)	06:41		07:15		06:55		07:31	08:08 (LZ66)
	20:53	20:24	07:59 (LZ65)	19:33		18:38		16:51		16:32	08:32 (LZ66)
10	05:37	06:07	07:13 (LZ65)	06:42		07:17		06:56		07:32	08:09 (LZ66)
	20:53	20:22	07:59 (LZ65)	19:31		18:36		16:50		16:32	08:32 (LZ66)
11	05:37	06:08	07:13 (LZ65)	06:43		07:18		06:57		07:33	08:10 (LZ66)
	20:52	20:21	07:59 (LZ65)	19:29		18:35		16:49		16:32	08:32 (LZ66)
12	05:38	06:09	07:13 (LZ65)	06:44		07:19		06:59		07:33	08:10 (LZ66)
	20:52	20:19	07:59 (LZ65)	19:27		18:33		16:48		16:32	08:33 (LZ66)
13	05:39	06:10	07:12 (LZ65)	06:45		07:20		07:00		07:34	08:11 (LZ66)
	20:51	20:18	07:59 (LZ65)	19:25		18:31		16:47	4	08:14 (LZ66)	16:32
14	05:40	06:12	07:12 (LZ65)	06:47		07:21		07:01		08:06 (LZ66)	16:35
	20:51	20:17	07:59 (LZ65)	19:24		18:30		16:46	11	08:17 (LZ66)	16:33
15	05:41	06:13	07:12 (LZ65)	06:48		07:23		07:03		08:05 (LZ66)	16:36
	20:50	20:15	07:58 (LZ65)	19:22		18:28		16:45	15	08:20 (LZ66)	16:33
16	05:41	06:14	07:13 (LZ65)	06:49		07:24		07:04		08:03 (LZ66)	16:37
	20:49	20:13	07:59 (LZ65)	19:20		18:26		16:44	18	08:21 (LZ66)	16:33
17	05:42	06:15	07:13 (LZ65)	06:50		07:25		07:05		08:03 (LZ66)	16:37
	20:49	20:12	07:59 (LZ65)	19:18		18:25		16:43	20	08:23 (LZ66)	16:33
18	05:43	06:16	07:13 (LZ65)	06:51		07:26		07:07		08:02 (LZ66)	16:38
	20:48	20:10	07:58 (LZ65)	19:16		18:23		16:42	22	08:24 (LZ66)	16:34
19	05:44	06:17	07:13 (LZ65)	06:52		07:28		07:08		08:01 (LZ66)	16:39
	20:47	20:09	07:58 (LZ65)	19:14	9	07:48 (LZ64)	18:21	16:41	23	08:24 (LZ66)	16:34
20	05:45	06:18	07:13 (LZ65)	06:53		07:37 (LZ64)	07:29	07:09		08:01 (LZ66)	16:39
	20:46	20:07	07:57 (LZ65)	19:13	14	07:51 (LZ64)	18:20	16:41	25	08:26 (LZ66)	16:34
21	05:46	06:19	07:13 (LZ65)	06:54		07:35 (LZ64)	07:30	07:10		08:01 (LZ66)	16:40
	20:45	20:06	07:56 (LZ65)	19:11	17	07:52 (LZ64)	18:18	16:40	25	08:26 (LZ66)	16:35
22	05:47	06:21	07:13 (LZ65)	06:56		07:33 (LZ64)	07:31	07:12		08:00 (LZ66)	16:40
	20:44	20:04	07:55 (LZ65)	19:09	19	07:52 (LZ64)	18:16	16:39	27	08:27 (LZ66)	16:35
23	05:48	06:22	07:14 (LZ65)	06:57		07:32 (LZ64)	07:33	07:13		08:01 (LZ66)	16:41
	20:44	20:02	07:54 (LZ65)	19:07	21	07:53 (LZ64)	18:15	16:38	27	08:28 (LZ66)	16:36
24	05:49	07:32 (LZ65)	06:23	06:58		07:31 (LZ64)	07:34	07:14		08:01 (LZ66)	16:41
	20:43	9	07:41 (LZ65)	20:01	39	07:53 (LZ64)	18:13	16:38	27	08:28 (LZ66)	16:36
25	05:50	07:29 (LZ65)	06:24	06:59		07:30 (LZ64)	06:35	07:15		08:01 (LZ66)	16:42
	20:42	15	07:44 (LZ65)	19:59	37	07:52 (LZ65)	17:12	16:37	27	08:28 (LZ66)	16:37
26	05:51	07:27 (LZ65)	06:25	07:00		07:30 (LZ64)	06:37	07:17		08:02 (LZ66)	16:42
	20:41	19	07:46 (LZ65)	19:57	34	07:50 (LZ65)	17:10	16:36	27	08:29 (LZ66)	16:38
27	05:52	07:25 (LZ65)	06:26	07:01		07:29 (LZ64)	06:38	07:18		08:02 (LZ66)	16:42
	20:40	23	07:48 (LZ65)	19:56	31	07:48 (LZ65)	17:09	16:36	27	08:29 (LZ66)	16:38
28	05:53	07:24 (LZ65)	06:27	07:02		07:30 (LZ64)	06:39	07:19		08:02 (LZ66)	16:43
	20:39	26	07:50 (LZ65)	19:54	28	07:46 (LZ65)	18:58	16:35	27	08:29 (LZ66)	16:39
29	05:54	07:23 (LZ65)	06:29	07:04		07:31 (LZ64)	06:40	07:20		08:02 (LZ66)	16:43
	20:37	28	07:51 (LZ65)	19:52	24	07:45 (LZ65)	18:56	16:35	28	08:30 (LZ66)	16:40
30	05:55	07:21 (LZ65)	06:30	07:05		07:31 (LZ64)	06:42	07:21		08:02 (LZ66)	16:43
	20:36	31	07:52 (LZ65)	19:51	17	07:41 (LZ65)	18:54	16:34	28	08:30 (LZ66)	16:40
31	05:56	07:20 (LZ65)	06:31	07:06		07:31 (LZ64)	06:43			07:43	08:19 (LZ66)
	20:35	33	07:53 (LZ65)	19:49	6	07:35 (LZ65)	17:03			16:41	08:41 (LZ66)
Potential sun hours	468		433		376		342		291		279
Total, worst case	184		1209		228		25		408		682
Sun reduction	0.59		0.65		0.59		0.47		0.36		0.26
Oper. time red.	1.00		1.00		1.00		1.00		1.00		1.00
Wind dir. red.	0.59		0.59		0.62		0.62		0.67		0.67
Total reduction	0.35		0.38		0.36		0.29		0.24		0.18
Total, real	64		464		83		7		99		120

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: LoZ_03 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -99.0° Slope: 90.0° (56)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March	April	May	June
1	07:44	07:28	08:08 (LZ66)	06:48	07:33 (LZ67)	06:53
16:42	17:19	33	08:41 (LZ66)	17:57	7	07:40 (LZ67)
2	07:44	07:27	08:08 (LZ66)	06:46	19:35	21
16:43	17:21	33	08:41 (LZ66)	17:58	06:51	07:17 (LZ64)
3	07:44	07:25	08:08 (LZ66)	06:45	19:36	23
16:44	17:22	33	08:41 (LZ66)	18:00	06:49	07:17 (LZ64)
4	07:44	07:24	08:08 (LZ66)	06:43	19:38	24
16:45	17:23	33	08:41 (LZ66)	18:01	06:48	07:41 (LZ64)
5	07:44	07:23	08:08 (LZ66)	06:41	19:39	24
16:46	17:25	33	08:41 (LZ66)	18:02	06:46	07:40 (LZ64)
6	07:44	07:22	08:09 (LZ66)	06:40	19:40	25
16:47	17:26	32	08:41 (LZ66)	18:03	06:44	07:15 (LZ64)
7	07:43	07:21	08:09 (LZ66)	06:38	19:41	24
16:48	17:27	32	08:41 (LZ66)	18:05	06:42	07:39 (LZ64)
8	07:43	07:19	08:09 (LZ66)	06:36	19:42	24
16:49	17:29	31	08:40 (LZ66)	18:06	06:41	07:15 (LZ64)
9	07:43	07:18	08:10 (LZ66)	06:34	19:44	23
16:50	17:30	30	08:40 (LZ66)	18:07	06:39	07:15 (LZ64)
10	07:43	07:17	08:10 (LZ66)	06:33	19:45	22
16:51	17:32	29	08:39 (LZ66)	18:08	06:37	07:37 (LZ64)
11	07:43	07:15	08:12 (LZ66)	06:31	19:46	20
16:52	17:33	27	08:39 (LZ66)	18:10	06:35	07:36 (LZ64)
12	07:42	07:14	08:13 (LZ66)	06:29	19:47	17
16:53	17:34	25	08:38 (LZ66)	18:11	06:34	07:35 (LZ64)
13	07:42	07:13	08:14 (LZ66)	06:27	19:48	13
16:55	17:36	22	08:36 (LZ66)	18:12	06:32	07:32 (LZ64)
14	07:41	07:11	08:16 (LZ66)	06:26	19:50	7
16:56	17:37	19	08:35 (LZ66)	18:13	06:32	07:21 (LZ64)
15	07:41	07:10	07:33 (LZ67)	06:24	19:51	7
16:57	17:38	24	08:32 (LZ66)	18:15	06:30	07:28 (LZ64)
16	07:41	07:08	07:31 (LZ67)	06:22	19:52	
16:58	17:40	17	08:27 (LZ66)	18:16	19:52	
17	07:40	07:07	07:29 (LZ67)	06:20	19:52	
16:59	17:41	17	07:46 (LZ67)	18:17	19:52	
18	07:39	07:06	07:29 (LZ67)	06:18	19:52	
17:01	17:42	19	07:48 (LZ67)	18:18	19:52	
19	07:39	07:04	07:27 (LZ67)	06:17	19:52	
17:02	17:44	21	07:48 (LZ67)	18:20	19:52	
20	07:38	08:18 (LZ66)	07:03	07:27 (LZ67)	06:15	
17:03	7	08:25 (LZ66)	17:45	22	07:49 (LZ67)	18:21
21	07:37	08:16 (LZ66)	07:01	07:27 (LZ67)	06:13	
17:05	13	08:29 (LZ66)	17:46	22	07:49 (LZ67)	18:22
22	07:37	08:14 (LZ66)	06:59	07:26 (LZ67)	06:11	
17:06	17	08:31 (LZ66)	17:48	22	07:48 (LZ67)	18:23
23	07:36	08:13 (LZ66)	06:58	07:27 (LZ67)	06:09	
17:07	19	08:32 (LZ66)	17:49	22	07:49 (LZ67)	18:24
24	07:35	08:12 (LZ66)	06:56	07:27 (LZ67)	06:08	
17:08	22	08:34 (LZ66)	17:50	21	07:48 (LZ67)	18:26
25	07:34	08:11 (LZ66)	06:55	07:28 (LZ67)	06:06	
17:10	24	08:35 (LZ66)	17:52	20	07:48 (LZ67)	18:27
26	07:33	08:10 (LZ66)	06:53	07:28 (LZ67)	06:04	
17:11	26	08:36 (LZ66)	17:53	19	07:47 (LZ67)	18:28
27	07:33	08:09 (LZ66)	06:51	07:29 (LZ67)	06:02	
17:12	28	08:37 (LZ66)	17:54	16	07:45 (LZ67)	18:29
28	07:32	08:09 (LZ66)	06:50	07:31 (LZ67)	06:00	
17:14	29	08:38 (LZ66)	17:56	13	07:44 (LZ67)	18:30
29	07:31	08:09 (LZ66)		06:58	07:24 (LZ64)	
17:15	30	08:39 (LZ66)		19:32	12	07:36 (LZ64)
30	07:30	08:08 (LZ66)		06:57	07:22 (LZ64)	
17:16	31	08:39 (LZ66)		19:33	16	07:38 (LZ64)
31	07:29	08:08 (LZ66)		06:55	07:20 (LZ64)	
17:18	32	08:40 (LZ66)		19:34	19	07:39 (LZ64)
Potential sun hours	289	293	369	402	456	462
Total, worst case	278	687	54	267		
Sun reduction	0.28	0.29	0.31	0.40		
Oper. time red.	1.00	1.00	1.00	1.00		
Wind dir. red.	0.66	0.65	0.61	0.61		
Total reduction	0.19	0.19	0.19	0.24		
Total, real	52	130	10	64		

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		





SHADOW - Calendar

Calculation: Real Case Shadow receptor: LoZ_03 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -99.0° Slope: 90.0° (56)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:55	05:57 20:34	06:32 19:47	07:17 (LZ64) 18:52	06:44 17:02	07:40 (LZ66) 16:34
2	05:31 20:55	05:58 20:33	06:33 19:45	07:15 (LZ64) 18:51	06:46 17:00	07:40 (LZ66) 16:34
3	05:32 20:55	05:59 20:32	06:34 19:44	07:13 (LZ64) 18:49	06:47 16:59	07:39 (LZ66) 16:33
4	05:33 20:55	06:00 20:30	06:35 19:42	07:12 (LZ64) 18:47	06:48 16:58	07:38 (LZ66) 16:33
5	05:33 20:55	06:02 20:29	06:36 19:40	07:11 (LZ64) 18:45	06:50 16:56	07:39 (LZ66) 16:33
6	05:34 20:54	06:03 20:28	06:38 19:38	07:11 (LZ64) 18:43	06:51 16:55	07:38 (LZ66) 16:33
7	05:34 20:54	06:04 20:26	06:39 19:36	07:10 (LZ64) 18:42	06:52 16:54	07:39 (LZ66) 16:32
8	05:35 20:54	06:05 20:25	06:40 19:35	07:10 (LZ64) 18:40	06:53 16:53	07:39 (LZ66) 16:32
9	05:36 20:53	06:06 20:24	06:41 19:33	07:10 (LZ64) 18:38	06:55 16:51	07:38 (LZ66) 16:32
10	05:37 20:53	06:07 20:22	06:42 19:31	07:11 (LZ64) 18:36	06:56 16:50	07:39 (LZ66) 16:32
11	05:37 20:52	06:08 20:21	06:43 19:29	07:11 (LZ64) 18:35	06:57 16:49	07:39 (LZ66) 16:32
12	05:38 20:52	06:09 20:19	06:44 19:27	07:12 (LZ64) 18:33	06:59 16:48	07:40 (LZ66) 16:32
13	05:39 20:51	06:10 20:18	06:45 19:25	07:13 (LZ64) 18:31	07:00 16:47	07:41 (LZ66) 16:32
14	05:40 20:51	06:12 20:17	06:47 19:24	07:14 (LZ64) 18:30	07:01 16:46	07:41 (LZ66) 16:33
15	05:41 20:50	06:13 20:15	06:48 19:22	07:18 (LZ64) 18:28	07:03 16:45	07:42 (LZ66) 16:33
16	05:41 20:49	06:14 20:13	06:49 19:20	07:22 (LZ64) 18:26	18 08:18 (LZ67) 16:44	08:10 (LZ66) 16:33
17	05:42 20:49	06:15 20:12	06:50 19:18	07:25 18:25	07:05 16:43	07:45 (LZ66) 16:33
18	05:43 20:48	06:16 20:10	06:51 19:16	07:26 18:23	07:07 16:42	07:46 (LZ66) 16:34
19	05:44 20:47	06:17 20:09	06:52 19:14	07:28 18:21	07:08 16:41	07:47 (LZ66) 16:34
20	05:45 20:46	06:18 20:07	06:53 19:13	07:29 18:20	07:09 16:41	07:49 (LZ66) 16:34
21	05:46 20:45	06:19 20:06	06:54 19:11	07:30 18:18	07:10 16:40	07:51 (LZ66) 16:35
22	05:47 20:44	06:21 20:04	06:56 19:09	07:31 18:16	07:12 16:39	07:54 (LZ66) 16:35
23	05:48 20:44	06:22 20:02	06:57 19:07	07:33 18:15	07:13 16:38	08:01 (LZ66) 16:36
24	05:49 20:43	06:23 20:01	06:58 19:05	07:34 18:13	07:14 16:38	16:36
25	05:50 20:42	06:24 19:59	06:59 19:03	07:35 17:12	06:59 (LZ67) 16:37	16:37
26	05:51 20:41	06:25 19:57	07:00 19:02	06:37 17:10	07:01 (LZ67) 16:36	16:38
27	05:52 20:40	06:26 19:56	07:01 19:00	06:38 17:09	07:04 (LZ67) 16:36	16:38
28	05:53 20:39	06:27 19:54	07:02 18:58	06:39 17:07	07:45 (LZ66) 16:35	16:39
29	05:54 20:37	06:29 19:52	07:04 18:56	06:40 17:06	07:43 (LZ66) 16:35	16:40
30	05:55 20:36	06:30 19:51	07:22 (LZ64) 07:30 (LZ64)	06:42 17:04	07:42 (LZ66) 16:34	16:40
31	05:56 20:35	06:31 19:49	07:19 (LZ64) 07:32 (LZ64)	06:43 17:03	08:07 (LZ66) 16:34	16:41
Potential sun hours	468	433	376	342	291	279
Total, worst case		21	302	387	596	
Sun reduction		0.65	0.59	0.47	0.36	
Oper. time red.		1.00	1.00	1.00	1.00	
Wind dir. red.		0.61	0.61	0.64	0.66	
Total reduction		0.39	0.36	0.30	0.24	
Total, real		8	108	117	144	

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: LoZ_04 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -100.3° Slope: 90.0° (57)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

January		February		March		April		May		June		
1	07:44		07:28	08:09 (LZ73)	06:48		07:34 (LZ66)	06:53		06:03	06:38 (LZ64)	05:31
	16:42		17:19	08:26 (LZ73)	17:57	37	08:11 (LZ66)	19:35		20:11	07:03 (LZ64)	20:44
2	07:44		07:27	08:11 (LZ73)	06:46		07:33 (LZ66)	06:51		06:02	06:39 (LZ64)	05:31
	16:43		17:21	08:25 (LZ73)	17:58	37	08:10 (LZ66)	19:36		20:12	07:03 (LZ64)	20:45
3	07:44		07:25	08:12 (LZ73)	06:45		07:32 (LZ66)	06:49		06:00	06:40 (LZ64)	05:30
	16:44		17:22	08:22 (LZ73)	18:00	38	08:10 (LZ66)	19:38		20:13	07:03 (LZ64)	20:45
4	07:44		07:24		06:43		07:33 (LZ66)	06:48		05:59	06:40 (LZ64)	05:30
	16:45		17:23		18:01	37	08:10 (LZ66)	19:39		20:15	07:01 (LZ64)	20:46
5	07:44		07:23		06:41		07:07 (LZ67)	06:46		05:58	06:41 (LZ64)	05:29
	16:46		17:25		18:02	46	08:09 (LZ66)	19:40		20:16	07:01 (LZ64)	20:47
6	07:44		07:22		06:40		07:04 (LZ67)	06:44		05:56	06:42 (LZ64)	05:29
	16:47		17:26		18:03	50	08:08 (LZ66)	19:41		20:17	07:00 (LZ64)	20:48
7	07:43		07:21		06:38		07:02 (LZ67)	06:42		05:55	06:43 (LZ64)	05:28
	16:48		17:27		18:05	52	08:07 (LZ66)	19:42		20:18	06:59 (LZ64)	20:48
8	07:43		07:19		06:36		07:01 (LZ67)	06:41		05:54	06:44 (LZ64)	05:28
	16:49		17:29		18:06	53	08:07 (LZ66)	19:44		20:19	06:56 (LZ64)	20:49
9	07:43		07:18		06:34		07:00 (LZ67)	06:39		05:52	06:47 (LZ64)	05:28
	16:50		17:30		18:07	54	08:06 (LZ66)	19:45		20:20	06:53 (LZ64)	20:50
10	07:43		07:17		06:33		06:59 (LZ67)	06:37		05:51		05:28
	16:51		17:32		18:08	52	08:04 (LZ66)	19:46		20:22		20:50
11	07:43		07:15		06:31		06:58 (LZ67)	06:35		05:50		05:27
	16:52		17:33		18:10	50	08:02 (LZ66)	19:47		20:23		20:51
12	07:42		07:14		06:29		06:58 (LZ67)	06:34		05:49		05:27
	16:53	3	08:13 (LZ73)	17:34	18:11	47	08:01 (LZ66)	19:48		20:24		20:51
13	07:42		08:08 (LZ73)	07:13	06:27		06:58 (LZ67)	06:32		05:48		05:27
	16:55	9	08:17 (LZ73)	17:36	18:12	42	07:58 (LZ66)	19:50		20:25		20:52
14	07:41		08:07 (LZ73)	07:11	06:26		06:58 (LZ67)	06:30		05:46		05:27
	16:56	11	08:18 (LZ73)	17:37	18:13	35	07:54 (LZ66)	19:51		20:26		20:52
15	07:41		08:06 (LZ73)	07:10	06:24		06:58 (LZ67)	06:29		05:45		05:27
	16:57	14	08:20 (LZ73)	17:38	18:15	22	07:20 (LZ67)	19:52		20:27		20:53
16	07:41		08:05 (LZ73)	07:08	06:22		06:58 (LZ67)	06:27		05:44		05:27
	16:58	16	08:21 (LZ73)	17:40	18:16	20	07:18 (LZ67)	19:53		20:28		20:53
17	07:40		08:05 (LZ73)	07:07	06:20		07:00 (LZ67)	06:25		05:43		05:27
	16:59	17	08:22 (LZ73)	17:41	18:17	18	07:18 (LZ67)	19:54		20:29		20:54
18	07:39		08:05 (LZ73)	07:06	06:18		07:01 (LZ67)	06:24		05:42		05:27
	17:01	18	08:23 (LZ73)	17:42	18:18	15	07:16 (LZ67)	19:56		20:30		20:54
19	07:39		08:04 (LZ73)	07:04	06:17		07:04 (LZ67)	06:22		05:41		05:27
	17:02	20	08:24 (LZ73)	17:44	18:20	8	07:12 (LZ67)	19:57		20:32		20:54
20	07:38		08:04 (LZ73)	07:03	06:15			06:20		05:40		05:27
	17:03	21	08:25 (LZ73)	17:45	18:21			19:58	11	06:59 (LZ64)	05:33	20:55
21	07:37		08:05 (LZ73)	07:01	06:13			06:19		06:45 (LZ64)	05:39	20:52
	17:05	21	08:26 (LZ73)	17:46	18:22			19:59	16	07:01 (LZ64)	05:34	20:55
22	07:37		08:04 (LZ73)	06:59	06:11			06:17		06:44 (LZ64)	05:38	20:52
	17:06	22	08:26 (LZ73)	17:48	18:23			20:00	19	07:03 (LZ64)	05:35	20:55
23	07:36		08:04 (LZ73)	06:58	06:09			06:15		06:42 (LZ64)	05:37	20:52
	17:07	23	08:27 (LZ73)	17:49	18:24			20:02	21	07:03 (LZ64)	05:36	20:55
24	07:35		08:04 (LZ73)	06:56	06:08			06:14		06:42 (LZ64)	05:37	20:52
	17:08	23	08:27 (LZ73)	17:50	18:26			20:03	22	07:04 (LZ64)	05:37	20:55
25	07:34		08:04 (LZ73)	06:55	06:06			06:12		06:40 (LZ64)	05:36	20:52
	17:10	23	08:27 (LZ73)	17:52	18:27			20:04	24	07:04 (LZ64)	05:38	20:56
26	07:33		08:05 (LZ73)	06:53	06:04			06:11		06:40 (LZ64)	05:35	20:52
	17:11	22	08:27 (LZ73)	17:53	18:28			20:05	25	07:05 (LZ64)	05:39	20:56
27	07:33		08:05 (LZ73)	06:51	06:02			06:09		06:39 (LZ64)	05:34	20:52
	17:12	23	08:28 (LZ73)	17:54	18:29			20:06	26	07:05 (LZ64)	05:39	20:56
28	07:32		08:06 (LZ73)	06:50	06:00			06:08		06:39 (LZ64)	05:34	20:53
	17:14	21	08:27 (LZ73)	17:56	18:30			20:08	26	07:05 (LZ64)	05:40	20:56
29	07:31		08:06 (LZ73)		06:58			06:06		06:39 (LZ64)	05:33	20:53
	17:15	21	08:27 (LZ73)		19:32			20:09	25	07:04 (LZ64)	05:41	20:56
30	07:30		08:07 (LZ73)		06:57			06:05		06:39 (LZ64)	05:32	20:53
	17:16	20	08:27 (LZ73)		19:33			20:10	25	07:04 (LZ64)	05:42	20:56
31	07:29		08:08 (LZ73)		06:55					05:32		
	17:18	19	08:27 (LZ73)		19:34					20:43		
Potential sun hours	289		293		369		402		456		462	
Total, worst case	367		326		713		240		165			
Sun reduction	0.28		0.29		0.31		0.40		0.47			
Oper. time red.	1.00		1.00		1.00		1.00		1.00			
Wind dir. red.	0.66		0.64		0.63		0.57		0.57			
Total reduction	0.19		0.18		0.19		0.23		0.27			
Total, real	68		60		137		54		44			

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: LoZ_04 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -100.3° Slope: 90.0° (57)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:55	05:57 20:34	06:32 19:47	07:06 18:52	07:37 (LZ67) 08:39 (LZ66)	06:44 17:02
2	05:31 20:55	05:58 20:33	06:33 19:45	07:07 18:51	07:37 (LZ67) 08:40 (LZ66)	06:46 17:00
3	05:32 20:55	05:59 20:32	06:34 19:44	07:08 18:49	07:36 (LZ67) 08:41 (LZ66)	06:47 16:59
4	05:33 20:55	06:00 20:30	06:35 19:42	07:09 18:47	07:37 (LZ67) 08:43 (LZ66)	06:48 16:58
5	05:33 20:55	06:02 20:29	06:36 19:40	07:11 18:45	07:37 (LZ67) 08:43 (LZ66)	06:50 16:56
6	05:34 20:54	06:03 20:28	06:38 19:38	07:12 18:43	07:38 (LZ67) 08:44 (LZ66)	06:51 16:55
7	05:34 20:54	06:04 20:26	06:39 19:36	07:13 18:42	07:39 (LZ67) 08:44 (LZ66)	06:52 16:54
8	05:35 20:54	06:05 20:25	06:40 19:35	07:14 18:40	07:40 (LZ67) 08:44 (LZ66)	06:53 16:53
9	05:36 20:53	06:06 20:24	06:41 19:33	07:15 18:38	07:44 (LZ67) 08:45 (LZ66)	06:55 16:51
10	05:37 20:53	06:07 20:22	06:42 19:31	07:17 18:36	07:47 (LZ73) 08:44 (LZ66)	07:29 16:50
11	05:37 20:52	06:08 20:21	06:43 19:29	07:18 18:35	07:49 (LZ73) 08:07 (LZ66)	07:30 16:49
12	05:38 20:52	06:09 20:19	06:44 19:27	07:19 18:33	07:53 (LZ73) 08:06 (LZ66)	07:31 16:48
13	05:39 20:51	06:10 20:18	06:45 19:25	07:20 18:31	07:59 (LZ73) 08:07 (LZ66)	07:32 16:47
14	05:40 20:51	06:12 20:16	06:47 19:24	07:21 18:30	07:59 (LZ73) 08:07 (LZ66)	07:33 16:46
15	05:41 20:50	06:13 20:15	06:48 19:22	07:23 18:28	07:39 (LZ73) 08:07 (LZ66)	07:36 16:45
16	05:41 20:49	06:14 20:13	06:49 19:20	07:24 18:26	08:00 (LZ73) 08:41 (LZ66)	16:33
17	05:42 20:49	06:15 20:12	06:50 19:18	07:25 18:25	07:04 08:08 (LZ66)	16:32
18	05:43 20:48	06:16 20:10	06:51 19:16	07:26 18:23	07:05 08:41 (LZ66)	16:31
19	05:44 20:47	06:17 20:09	06:52 19:14	07:28 18:21	07:07 08:09 (LZ66)	16:30
20	05:45 20:46	06:18 20:07	06:53 19:13	07:29 18:20	07:08 08:37 (LZ66)	16:29
21	05:46 20:45	06:19 20:06	06:54 19:11	07:30 18:18	07:09 08:13 (LZ66)	16:28
22	05:47 20:44	06:21 20:04	06:56 19:09	07:31 18:16	07:10 08:35 (LZ66)	16:27
23	05:48 20:44	06:22 20:02	06:57 19:07	07:33 18:15	07:12 08:14 (LZ66)	16:26
24	05:49 20:43	06:23 20:01	06:58 19:05	07:34 18:13	07:13 08:32 (LZ66)	16:25
25	05:50 20:42	06:24 19:59	06:59 19:03	07:35 18:12	07:14 08:19 (LZ66)	16:24
26	05:51 20:41	06:25 19:57	07:00 19:02	07:36 18:10	07:15 08:29 (LZ66)	16:23
27	05:52 20:40	06:26 19:56	07:01 19:00	07:37 18:08	07:16 08:13 (LZ66)	16:22
28	05:53 20:39	06:27 19:54	07:02 18:58	07:38 18:06	07:17 08:37 (LZ66)	16:21
29	05:54 20:37	06:29 19:52	07:04 18:56	07:39 18:04	07:18 08:14 (LZ66)	16:20
30	05:55 20:36	06:30 19:51	07:05 18:54	07:40 18:02	07:19 08:32 (LZ66)	16:19
31	05:56 20:35	06:31 19:49	07:06 18:53	07:41 18:01	07:20 08:19 (LZ66)	16:18
Potential sun hours	468	433	376	342	291	279
Total, worst case		412	145	872	411	
Sun reduction		0.65	0.59	0.47	0.36	
Oper. time red.		1.00	1.00	1.00	1.00	
Wind dir. red.		0.57	0.62	0.63	0.66	
Total reduction		0.37	0.37	0.30	0.24	
Total, real		152	53	259	99	

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: LoZ_05 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -94.1° Slope: 90.0° (58)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

January			February			March			April			May			June		
1	07:44		08:29 (LZ74)	07:28		06:48			06:53		07:19 (LZ67)	06:03			05:31		06:01 (LZ64)
	16:42	31	09:00 (LZ74)	17:19		17:57			19:35	25	07:51 (LZ66)	20:11			20:44	20	06:21 (LZ64)
2	07:44		08:29 (LZ74)	07:27		06:46			06:51		07:17 (LZ67)	06:02			05:31		06:00 (LZ64)
	16:43	32	09:01 (LZ74)	17:21		17:58			19:36	37	07:55 (LZ66)	20:12			20:45	21	06:21 (LZ64)
3	07:44		08:30 (LZ74)	07:25		06:45			06:49		07:16 (LZ67)	06:00			05:30		06:00 (LZ64)
	16:44	31	09:01 (LZ74)	17:22		18:00			19:38	42	07:58 (LZ66)	20:13			20:45	22	06:22 (LZ64)
4	07:44		08:29 (LZ74)	07:24		06:43			06:48		07:15 (LZ67)	05:59			05:30		06:01 (LZ64)
	16:45	32	09:01 (LZ74)	17:23		18:01			19:39	45	08:00 (LZ66)	20:15			20:46	22	06:23 (LZ64)
5	07:44		08:30 (LZ74)	07:23		06:41			06:46		07:14 (LZ67)	05:58			05:29		06:00 (LZ64)
	16:46	32	09:02 (LZ74)	17:25		18:02			19:40	47	08:01 (LZ66)	20:16			20:47	22	06:22 (LZ64)
6	07:44		08:30 (LZ74)	07:22		06:40			06:44		07:13 (LZ67)	05:56			05:29		06:00 (LZ64)
	16:47	32	09:02 (LZ74)	17:26		18:03			19:41	49	08:02 (LZ66)	20:17			20:48	23	06:23 (LZ64)
7	07:43		08:31 (LZ74)	07:21		06:38			06:42		07:13 (LZ67)	05:55			05:28		06:00 (LZ64)
	16:48	32	09:03 (LZ74)	17:27		18:05			19:42	50	08:03 (LZ66)	20:18			20:48	24	06:24 (LZ64)
8	07:43		08:32 (LZ74)	07:19		06:36			06:41		07:12 (LZ67)	05:54			05:28		06:00 (LZ64)
	16:49	32	09:04 (LZ74)	17:29		18:06			19:44	52	08:04 (LZ66)	20:19			20:49	23	06:23 (LZ64)
9	07:43		08:31 (LZ74)	07:18		06:34			06:39		07:12 (LZ67)	05:52			05:28		06:00 (LZ64)
	16:50	32	09:03 (LZ74)	17:30		18:07			19:45	52	08:04 (LZ66)	20:20			20:50	24	06:24 (LZ64)
10	07:43		08:32 (LZ74)	07:17		06:33			06:37		07:12 (LZ67)	05:51			05:28		06:00 (LZ64)
	16:51	32	09:04 (LZ74)	17:32		18:08			19:46	52	08:04 (LZ66)	20:22			20:50	24	06:24 (LZ64)
11	07:43		08:33 (LZ74)	07:15	07:43 (LZ73)	06:31			06:35		07:13 (LZ67)	05:50			05:27		06:00 (LZ64)
	16:52	32	09:05 (LZ74)	17:33	10	18:10			19:47	51	08:04 (LZ66)	20:23			20:51	25	06:25 (LZ64)
12	07:42		08:33 (LZ74)	07:14	07:41 (LZ73)	06:29			06:34		07:13 (LZ67)	05:49			05:27		06:00 (LZ64)
	16:54	32	09:05 (LZ74)	17:34	15	18:11			19:48	51	08:04 (LZ66)	20:24			20:51	25	06:25 (LZ64)
13	07:42		08:34 (LZ74)	07:13	07:39 (LZ73)	06:27			06:32		07:14 (LZ67)	05:48			05:27		06:01 (LZ64)
	16:55	31	09:05 (LZ74)	17:36	18	18:12			19:50	50	08:04 (LZ66)	20:25			20:52	25	06:26 (LZ64)
14	07:41		08:34 (LZ74)	07:11	07:38 (LZ73)	06:26			06:30		07:16 (LZ67)	05:46			05:27		06:01 (LZ64)
	16:56	31	09:05 (LZ74)	17:37	20	18:13			19:51	48	08:04 (LZ66)	20:26			20:52	25	06:26 (LZ64)
15	07:41		08:35 (LZ74)	07:10	07:37 (LZ73)	06:24			06:29		07:18 (LZ67)	05:45			05:27		06:01 (LZ64)
	16:57	31	09:06 (LZ74)	17:38	22	18:15			19:52	46	08:04 (LZ66)	20:27			20:53	25	06:26 (LZ64)
16	07:40		08:35 (LZ74)	07:08	07:36 (LZ73)	06:22			06:27		07:21 (LZ66)	05:44			05:27		06:01 (LZ64)
	16:58	30	09:05 (LZ74)	17:40	24	18:16			19:53	42	08:03 (LZ66)	20:28			20:53	25	06:26 (LZ64)
17	07:40		08:36 (LZ74)	07:07	07:35 (LZ73)	06:20			06:25		07:21 (LZ66)	05:43			05:27		06:01 (LZ64)
	16:59	29	09:05 (LZ74)	17:41	25	18:17			19:54	42	08:03 (LZ66)	20:29			20:54	26	06:27 (LZ64)
18	07:39		08:37 (LZ74)	07:06	07:36 (LZ73)	06:18			06:24		07:21 (LZ66)	05:42			05:27		06:01 (LZ64)
	17:01	29	09:06 (LZ74)	17:42	25	18:18			19:56	41	08:02 (LZ66)	20:30			20:54	26	06:27 (LZ64)
19	07:39		08:37 (LZ74)	07:04	07:35 (LZ73)	06:17			06:22		07:21 (LZ66)	05:41			05:27		06:01 (LZ64)
	17:02	28	09:05 (LZ74)	17:44	25	18:20			19:57	40	08:01 (LZ66)	20:31			20:54	26	06:27 (LZ64)
20	07:38		08:38 (LZ74)	07:02	07:35 (LZ73)	06:15			06:20		07:22 (LZ66)	05:40			05:27		06:01 (LZ64)
	17:03	27	09:05 (LZ74)	17:45	26	18:21			19:58	39	08:01 (LZ66)	20:33			20:55	26	06:27 (LZ64)
21	07:37		08:39 (LZ74)	07:01	07:35 (LZ73)	06:13			06:19		07:21 (LZ66)	05:39			05:27		06:01 (LZ64)
	17:05	25	09:04 (LZ74)	17:46	25	18:22			19:59	38	07:59 (LZ66)	20:34			20:55	26	06:27 (LZ64)
22	07:37		08:41 (LZ74)	06:59	07:35 (LZ73)	06:11			06:17		07:22 (LZ66)	05:38			05:28		06:02 (LZ64)
	17:06	23	09:04 (LZ74)	17:48	24	18:23			20:00	37	07:59 (LZ66)	20:35			20:55	26	06:28 (LZ64)
23	07:36		08:42 (LZ74)	06:58	07:36 (LZ73)	06:09			06:15		07:23 (LZ66)	05:38			05:28		06:02 (LZ64)
	17:07	21	09:03 (LZ74)	17:49	23	18:24			20:02	34	07:57 (LZ66)	20:36			20:55	26	06:28 (LZ64)
24	07:35		08:43 (LZ74)	06:56	07:36 (LZ73)	06:08			06:14		07:24 (LZ66)	05:37			05:28		06:02 (LZ64)
	17:08	19	09:02 (LZ74)	17:50	22	18:26			20:03	33	07:57 (LZ66)	20:37			20:55	26	06:28 (LZ64)
25	07:34		08:45 (LZ74)	06:55	07:38 (LZ73)	06:06			06:12		07:24 (LZ66)	05:36			05:28		06:02 (LZ64)
	17:10	16	09:01 (LZ74)	17:52	19	18:27			20:04	31	07:55 (LZ66)	20:38			20:56	26	06:28 (LZ64)
26	07:33		08:47 (LZ74)	06:53	07:39 (LZ73)	06:04			06:11		07:26 (LZ66)	05:35		06:07 (LZ64)	05:29		06:03 (LZ64)
	17:11	12	08:59 (LZ74)	17:53	16	18:28			20:05	28	07:54 (LZ66)	20:39	6	06:13 (LZ64)	20:56	26	06:29 (LZ64)
27	07:33			06:51	07:41 (LZ73)	06:02			06:09		07:27 (LZ66)	05:34		06:05 (LZ64)	05:29		06:03 (LZ64)
	17:12			17:54	11	18:29			20:06	24	07:51 (LZ66)	20:39	11	06:16 (LZ64)	20:56	25	06:28 (LZ64)
28	07:32			06:50		06:00			06:08		07:29 (LZ66)	05:34		06:04 (LZ64)	05:30		06:04 (LZ64)
	17:14			17:56		18:30			20:08	21	07:50 (LZ66)	20:40	13	06:17 (LZ64)	20:56	25	06:29 (LZ64)
29	07:31					06:58			06:06		07:31 (LZ66)	05:33		06:02 (LZ64)	05:30		06:04 (LZ64)
	17:15					19:32			20:09	15	07:46 (LZ66)	20:41	15	06:17 (LZ64)	20:56	25	06:29 (LZ64)
30	07:30					06:57	07:27 (LZ67)		06:05		07:35 (LZ66)	05:32		06:02 (LZ64)	05:30		06:04 (LZ64)
	17:16					19:33	2	07:29 (LZ67)	20:10	7	07:42 (LZ66)	20:42	17	06:19 (LZ64)	20:56	24	06:28 (LZ64)
31	07:29					06:55	07:21 (LZ67)					05:32		06:01 (LZ64)			
	17:18					19:34	13	07:34 (LZ67)				20:43	18	06:19 (LZ64)			
Potential sun hours	289		293			369			402			456			462		
Total, worst case	734		350			15			1169			80			734		
Sun reduction	0.28		0.29			0.31			0.40			0.47			0.49		
Oper. time red.	1.00		1.00			1.00			1.00			1.00			1.00		
Wind dir. red.	0.66		0.64			0.60			0.61			0.60			0.60		
Total reduction	0.19		0.19			0.18			0.24			0.28			0.30		
Total, real	136		65			3			281			22			218		

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: LoZ_05 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -94.1° Slope: 90.0° (58)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:55 25	06:04 (LZ64) 06:29 (LZ64) 20:34	05:57 20:34	06:32 19:47 51	07:12 (LZ67) 08:03 (LZ66) 18:52	07:06 17:02 16:34 32
2	05:31 20:55 25	06:05 (LZ64) 06:30 (LZ64) 20:33	05:58 20:33	06:33 19:45 52	07:11 (LZ67) 08:03 (LZ66) 18:51	07:07 17:00 16:34 32
3	05:32 20:55 24	06:05 (LZ64) 06:29 (LZ64) 20:32	05:59 20:32	06:34 19:44 52	07:10 (LZ67) 08:02 (LZ66) 18:49	07:08 16:59 16:33 33
4	05:33 20:55 24	06:06 (LZ64) 06:30 (LZ64) 20:30	06:00 20:30	06:35 19:42 52	07:09 (LZ67) 08:01 (LZ66) 18:47	07:09 16:58 16:33 32
5	05:33 20:55 24	06:06 (LZ64) 06:29 (LZ64) 20:29	06:02 20:29	06:36 19:40 50	07:09 (LZ67) 07:59 (LZ66) 18:45	07:11 16:56 16:33 32
6	05:34 20:54 23	06:06 (LZ64) 06:29 (LZ64) 20:28	06:03 20:28	06:38 19:38 49	07:09 (LZ67) 07:58 (LZ66) 18:43	07:12 16:55 16:33 32
7	05:34 20:54 23	06:07 (LZ64) 06:30 (LZ64) 20:26	06:04 20:26	06:39 19:36 47	07:09 (LZ67) 07:56 (LZ66) 18:42	07:13 16:54 16:32 32
8	05:35 20:54 22	06:07 (LZ64) 06:29 (LZ64) 20:25	06:05 20:25	06:40 19:35 45	07:09 (LZ67) 07:54 (LZ66) 18:40	07:14 16:53 16:32 32
9	05:36 20:53 21	06:08 (LZ64) 06:29 (LZ64) 20:24	06:06 20:24	06:41 19:33 43	07:09 (LZ67) 07:52 (LZ66) 18:38	07:15 16:51 16:32 32
10	05:37 20:53 21	06:08 (LZ64) 06:29 (LZ64) 20:22	06:07 20:22	06:42 19:31 38	07:11 (LZ67) 07:50 (LZ66) 18:36	07:17 16:50 16:32 32
11	05:37 20:52 20	06:08 (LZ64) 06:28 (LZ64) 20:21	06:08 20:21	06:43 19:29 28	07:11 (LZ67) 07:45 (LZ66) 18:35	07:18 16:49 16:32 31
12	05:38 20:52 19	06:09 (LZ64) 06:28 (LZ64) 20:19	06:09 20:19	06:44 19:27 13	07:13 (LZ67) 07:26 (LZ67) 18:33	07:19 16:48 16:32 31
13	05:39 20:51 18	06:10 (LZ64) 06:28 (LZ64) 20:18	06:10 20:18	06:45 19:25 6	07:16 (LZ67) 07:22 (LZ67) 18:31	07:20 16:47 16:32 31
14	05:40 20:51 16	06:11 (LZ64) 06:27 (LZ64) 20:16	06:12 20:16	06:47 19:24 17	07:21 18:30 5	07:01 16:46 16:33 31
15	05:41 20:50 15	06:12 (LZ64) 06:27 (LZ64) 20:15	06:13 20:15	06:48 19:22 22	07:23 18:28 13	07:03 16:45 2
16	05:41 20:49 12	06:13 (LZ64) 06:25 (LZ64) 20:13	06:14 20:13	06:49 19:20 26	07:24 18:26 17	07:04 16:44 12
17	05:42 20:48 8	06:15 (LZ64) 06:23 (LZ64) 20:12	06:15 20:12	06:50 19:18 29	07:25 18:25 20	07:05 16:43 16
18	05:43 20:48 7	06:16 (LZ64) 06:23 (LZ64) 20:11	06:16 20:11	06:51 19:16 31	07:26 18:23 21	07:06 16:42 19
19	05:44 20:47 6	06:17 (LZ64) 06:22 (LZ64) 20:10	06:17 20:10	06:52 19:14 34	07:27 18:21 24	07:07 16:41 21
20	05:45 20:46 5	06:18 (LZ64) 06:21 (LZ64) 20:09	06:18 20:09	06:53 19:13 35	07:28 18:20 25	07:08 16:41 23
21	05:46 20:45 4	06:19 (LZ64) 06:20 (LZ64) 20:08	06:19 20:08	06:54 19:11 37	07:29 18:18 25	07:09 16:40 25
22	05:47 20:44 3	06:21 (LZ64) 06:22 (LZ64) 20:07	06:21 20:07	06:56 19:09 38	07:31 18:16 25	07:12 16:39 27
23	05:48 20:44 2	06:22 (LZ64) 06:23 (LZ64) 20:06	06:22 20:06	06:57 19:07 40	07:33 18:15 26	07:13 16:38 28
24	05:49 20:43 1	06:23 (LZ64) 06:24 (LZ64) 20:05	06:23 20:05	06:58 19:05 41	07:34 18:13 25	07:14 16:38 29
25	05:50 20:42 0	06:24 (LZ64) 06:25 (LZ64) 20:04	06:24 20:04	06:59 19:03 42	07:35 18:12 24	07:15 16:37 29
26	05:51 20:41 0	06:25 (LZ64) 06:26 (LZ64) 20:03	06:25 20:03	07:00 19:02 43	07:36 18:10 23	07:16 16:36 30
27	05:52 20:40 0	06:26 (LZ64) 06:27 (LZ64) 20:02	06:26 20:02	07:01 19:00 44	07:37 18:09 22	07:17 16:35 31
28	05:53 20:39 0	06:27 (LZ64) 06:28 (LZ64) 20:01	06:27 20:01	07:02 18:58 45	07:38 18:08 20	07:18 16:34 31
29	05:54 20:37 0	06:29 (LZ64) 06:29 (LZ64) 20:00	06:29 20:00	07:04 18:56 46	07:39 18:07 17	07:19 16:33 31
30	05:55 20:36 0	06:30 (LZ64) 06:31 (LZ64) 20:00	06:30 20:00	07:05 18:54 47	07:40 18:06 14	07:20 16:32 32
31	05:56 20:35 0	06:31 (LZ64) 06:32 (LZ64) 20:00	06:31 20:00	07:06 18:53 48	07:41 18:05 8	07:21 16:31 291
Potential sun hours	468	433	376	342	291	279
Total, worst case	340	680	526	354	386	968
Sun reduction	0.59	0.65	0.59	0.47	0.36	0.26
Oper. time red.	1.00	1.00	1.00	1.00	1.00	1.00
Wind dir. red.	0.60	0.61	0.60	0.64	0.66	0.66
Total reduction	0.35	0.39	0.36	0.30	0.24	0.18
Total, real	120	266	188	107	93	170

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: LoZ_06 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -90.4° Slope: 90.0° (59)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

January		February		March		April		May		June	
1	07:44	07:28	08:12 (LZ74)	06:48	07:18 (LZ73)	06:53	06:03	06:43 (LZ67)	05:31	06:36 (LZ66)	
16:42		17:19	08:45 (LZ74)	17:57	10	07:28 (LZ73)	19:35	20:11	07:05 (LZ67)	20:44	42
2	07:44	07:27	08:12 (LZ74)	06:46	07:15 (LZ73)	06:51	06:02	06:44 (LZ67)	05:31	06:36 (LZ66)	
16:43		17:21	08:45 (LZ74)	17:58	15	07:30 (LZ73)	19:36	20:12	07:05 (LZ67)	20:45	41
3	07:44	07:25	08:11 (LZ74)	06:45	07:12 (LZ73)	06:49	06:00	06:45 (LZ67)	05:30	06:37 (LZ66)	
16:44		17:22	08:45 (LZ74)	18:00	19	07:31 (LZ73)	19:38	20:13	07:04 (LZ67)	20:45	41
4	07:44	07:24	08:11 (LZ74)	06:43	07:12 (LZ73)	06:48	05:59	06:45 (LZ67)	05:30	06:37 (LZ66)	
16:45		17:23	08:46 (LZ74)	18:01	21	07:33 (LZ73)	19:39	20:15	07:02 (LZ67)	20:46	41
5	07:44	07:23	08:11 (LZ74)	06:41	07:10 (LZ73)	06:46	05:58	06:47 (LZ67)	05:29	06:37 (LZ66)	
16:46		17:25	08:46 (LZ74)	18:02	24	07:34 (LZ73)	19:40	20:16	07:06 (LZ66)	20:47	40
6	07:44	07:22	08:12 (LZ74)	06:40	07:09 (LZ73)	06:44	05:56	06:45 (LZ66)	05:29	06:38 (LZ66)	
16:47		17:26	08:47 (LZ74)	18:03	25	07:34 (LZ73)	19:41	20:17	07:08 (LZ66)	20:48	40
7	07:43	07:21	08:11 (LZ74)	06:38	07:08 (LZ73)	06:42	05:55	06:44 (LZ66)	05:29	06:38 (LZ66)	
16:48		17:27	08:46 (LZ74)	18:05	26	07:34 (LZ73)	19:42	20:18	07:10 (LZ66)	20:48	40
8	07:43	07:19	08:12 (LZ74)	06:36	07:08 (LZ73)	06:41	05:54	06:41 (LZ66)	05:28	06:38 (LZ66)	
16:49		17:29	08:46 (LZ74)	18:06	26	07:34 (LZ73)	19:44	20:19	07:10 (LZ66)	20:49	39
9	07:43	07:18	08:12 (LZ74)	06:34	07:08 (LZ73)	06:39	05:52	06:40 (LZ66)	05:28	06:39 (LZ66)	
16:50		17:30	08:46 (LZ74)	18:07	26	07:34 (LZ73)	19:45	20:20	07:12 (LZ66)	20:50	38
10	07:43	07:17	08:12 (LZ74)	06:33	07:07 (LZ73)	06:37	05:51	06:39 (LZ66)	05:28	06:39 (LZ66)	
16:51		17:32	08:45 (LZ74)	18:08	26	07:33 (LZ73)	19:46	20:22	07:13 (LZ66)	20:50	39
11	07:43	07:15	08:13 (LZ74)	06:31	07:07 (LZ73)	06:35	05:50	06:39 (LZ66)	05:27	06:40 (LZ66)	
16:52		17:33	08:45 (LZ74)	18:10	26	07:33 (LZ73)	19:47	20:23	07:14 (LZ66)	20:51	38
12	07:42	07:14	08:14 (LZ74)	06:29	07:08 (LZ73)	06:34	05:49	06:38 (LZ66)	05:27	06:40 (LZ66)	
16:54		17:34	08:45 (LZ74)	18:11	25	07:33 (LZ73)	19:48	20:24	07:14 (LZ66)	20:51	38
13	07:42	07:13	08:14 (LZ74)	06:27	07:09 (LZ73)	06:32	05:48	06:37 (LZ66)	05:27	06:40 (LZ66)	
16:55		17:36	08:44 (LZ74)	18:12	22	07:31 (LZ73)	19:50	20:25	07:15 (LZ66)	20:52	38
14	07:41	07:11	08:15 (LZ74)	06:26	07:09 (LZ73)	06:30	05:46	06:37 (LZ66)	05:27	06:41 (LZ66)	
16:56		17:37	08:43 (LZ74)	18:13	21	07:30 (LZ73)	19:51	20:26	07:16 (LZ66)	20:52	37
15	07:41	07:10	08:16 (LZ74)	06:24	07:10 (LZ73)	06:29	05:45	06:36 (LZ66)	05:27	06:41 (LZ66)	
16:57		17:38	08:41 (LZ74)	18:15	18	07:28 (LZ73)	19:52	20:27	07:16 (LZ66)	20:53	37
16	07:40	07:08	08:18 (LZ74)	06:22	07:12 (LZ73)	06:27	05:44	06:36 (LZ66)	05:27	06:41 (LZ66)	
16:58		17:40	08:40 (LZ74)	18:16	13	07:25 (LZ73)	19:53	20:28	07:17 (LZ66)	20:53	37
17	07:40	07:07	08:19 (LZ74)	06:20	07:16 (LZ73)	06:25	05:43	06:36 (LZ66)	05:27	06:42 (LZ66)	
16:59		17:41	08:38 (LZ74)	18:17	6	07:22 (LZ73)	19:54	20:29	07:17 (LZ66)	20:54	36
18	07:39	07:06	08:23 (LZ74)	06:18		06:24	05:42	06:35 (LZ66)	05:27	06:42 (LZ66)	
17:01		17:42	08:35 (LZ74)	18:18		19:56	10	07:02 (LZ67)	20:30	20:54	36
19	07:39	07:04		06:17		06:22		06:49 (LZ67)	05:41	06:35 (LZ66)	05:27
17:02		17:44		18:20		19:57	15	07:04 (LZ67)	20:31	20:54	36
20	07:38	07:02		06:15		06:20		06:48 (LZ67)	05:40	06:35 (LZ66)	05:27
17:03		17:45		18:21		19:58	18	07:06 (LZ67)	20:33	20:55	36
21	07:37	07:01		06:13		06:19		06:46 (LZ67)	05:39	06:35 (LZ66)	05:27
17:05		17:46		18:22		19:59	21	07:07 (LZ67)	20:34	20:55	36
22	07:37		08:24 (LZ74)	06:59		06:17		06:45 (LZ67)	05:38	06:34 (LZ66)	05:28
17:06	5	08:29 (LZ74)	17:48	18:23		20:00	23	07:08 (LZ67)	20:35	20:55	36
23	07:36		08:20 (LZ74)	06:58		06:15		06:44 (LZ67)	05:38	06:34 (LZ66)	05:28
17:07	13	08:33 (LZ74)	17:49	18:24		20:02	24	07:08 (LZ67)	20:36	20:55	36
24	07:35		08:18 (LZ74)	06:56		06:14		06:44 (LZ67)	05:37	06:35 (LZ66)	05:28
17:08	17	08:35 (LZ74)	17:50	18:26		20:03	24	07:08 (LZ67)	20:37	20:55	36
25	07:34		08:17 (LZ74)	06:55		06:12		06:43 (LZ67)	05:36	06:35 (LZ66)	05:28
17:10	20	08:37 (LZ74)	17:52	18:27		20:04	25	07:08 (LZ67)	20:38	20:56	36
26	07:33		08:15 (LZ74)	06:53		06:11		06:43 (LZ67)	05:35	06:35 (LZ66)	05:29
17:11	23	08:38 (LZ74)	17:53	18:28		20:05	25	07:08 (LZ67)	20:39	20:56	37
27	07:33		08:15 (LZ74)	06:51		06:09		06:42 (LZ67)	05:34	06:35 (LZ66)	05:29
17:12	25	08:40 (LZ74)	17:54	18:29		20:06	26	07:08 (LZ67)	20:39	20:56	37
28	07:32		08:14 (LZ74)	06:50		06:08		06:43 (LZ67)	05:34	06:35 (LZ66)	05:30
17:14	27	08:41 (LZ74)	17:56	18:30		20:08	25	07:08 (LZ67)	20:40	20:56	37
29	07:31		08:13 (LZ74)	06:58		06:06		06:42 (LZ67)	05:33	06:35 (LZ66)	05:30
17:15	29	08:42 (LZ74)		19:32		20:09	25	07:07 (LZ67)	20:41	20:56	37
30	07:30		08:13 (LZ74)	06:57		06:05		06:43 (LZ67)	05:32	06:36 (LZ66)	05:30
17:17	30	08:43 (LZ74)		19:33		20:10	24	07:07 (LZ67)	20:42	20:56	38
31	07:29		08:12 (LZ74)	06:55				05:32	06:35 (LZ66)		
17:18	32	08:44 (LZ74)		19:34				20:43	42	07:17 (LZ66)	
Potential sun hours	289		293		369		402		456		462
Total, worst case	221		540		349		285		1106		1136
Sun reduction	0.28		0.29		0.31		0.40		0.47		0.49
Oper. time red.	1.00		1.00		1.00		1.00		1.00		1.00
Wind dir. red.	0.66		0.66		0.61		0.58		0.57		0.57
Total reduction	0.19		0.19		0.19		0.23		0.27		0.28
Total, real	41		104		65		65		297		322

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: LoZ_06 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -90.4° Slope: 90.0° (59)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

July		August		September		October		November		December	
1	05:31	06:44 (LZ66)	05:57	06:49 (LZ66)	06:32	07:06	07:47 (LZ73)	06:44	07:42 (LZ74)	07:22	
	20:55	38 07:22 (LZ66)	20:34	36 07:25 (LZ66)	19:47	18:52	24 08:11 (LZ73)	17:02	33 08:15 (LZ74)	16:34	
2	05:31	06:44 (LZ66)	05:58	06:50 (LZ66)	06:33	07:07	07:46 (LZ73)	06:46	07:41 (LZ74)	07:24	
	20:55	39 07:23 (LZ66)	20:33	34 07:24 (LZ66)	19:45	18:51	25 08:11 (LZ73)	17:00	34 08:15 (LZ74)	16:34	
3	05:32	06:44 (LZ66)	05:59	06:50 (LZ66)	06:34	07:08	07:45 (LZ73)	06:47	07:41 (LZ74)	07:25	
	20:55	38 07:22 (LZ66)	20:32	33 07:23 (LZ66)	19:44	18:49	26 08:11 (LZ73)	16:59	35 08:16 (LZ74)	16:33	
4	05:33	06:44 (LZ66)	06:00	06:51 (LZ66)	06:35	07:09	07:46 (LZ73)	06:48	07:41 (LZ74)	07:26	
	20:55	39 07:23 (LZ66)	20:30	31 07:22 (LZ66)	19:42	18:47	26 08:12 (LZ73)	16:58	35 08:16 (LZ74)	16:33	
5	05:33	06:44 (LZ66)	06:02	06:52 (LZ66)	06:36	07:11	07:45 (LZ73)	06:50	07:41 (LZ74)	07:27	
	20:55	39 07:23 (LZ66)	20:29	28 07:20 (LZ66)	19:40	18:45	26 08:11 (LZ73)	16:56	35 08:16 (LZ74)	16:33	
6	05:34	06:44 (LZ66)	06:03	06:54 (LZ66)	06:38	07:12	07:45 (LZ73)	06:51	07:41 (LZ74)	07:28	
	20:54	40 07:24 (LZ66)	20:28	25 07:19 (LZ66)	19:38	18:43	26 08:11 (LZ73)	16:55	35 08:16 (LZ74)	16:33	
7	05:34	06:44 (LZ66)	06:04	06:55 (LZ66)	06:39	07:13	07:44 (LZ73)	06:52	07:42 (LZ74)	07:29	
	20:54	40 07:24 (LZ66)	20:26	22 07:17 (LZ66)	19:36	18:42	26 08:10 (LZ73)	16:54	34 08:16 (LZ74)	16:32	
8	05:35	06:44 (LZ66)	06:05	06:56 (LZ67)	06:40	07:14	07:45 (LZ73)	06:53	07:42 (LZ74)	07:30	
	20:54	40 07:24 (LZ66)	20:25	18 07:14 (LZ66)	19:35	18:40	24 08:09 (LZ73)	16:53	34 08:16 (LZ74)	16:32	
9	05:36	06:44 (LZ66)	06:06	06:55 (LZ67)	06:41	07:15	07:46 (LZ73)	06:55	07:42 (LZ74)	07:31	
	20:53	41 07:25 (LZ66)	20:24	17 07:12 (LZ67)	19:33	18:38	22 08:08 (LZ73)	16:51	33 08:15 (LZ74)	16:32	
10	05:37	06:44 (LZ66)	06:07	06:53 (LZ67)	06:42	07:17	07:46 (LZ73)	06:56	07:43 (LZ74)	07:32	
	20:53	41 07:25 (LZ66)	20:22	20 07:13 (LZ67)	19:31	18:36	21 08:07 (LZ73)	16:50	33 08:16 (LZ74)	16:32	
11	05:37	06:44 (LZ66)	06:08	06:52 (LZ67)	06:43	07:18	07:47 (LZ73)	06:57	07:43 (LZ74)	07:33	
	20:52	41 07:25 (LZ66)	20:21	22 07:14 (LZ67)	19:29	18:35	18 08:05 (LZ73)	16:49	32 08:15 (LZ74)	16:32	
12	05:38	06:44 (LZ66)	06:09	06:51 (LZ67)	06:44	07:19	07:49 (LZ73)	06:59	07:45 (LZ74)	07:33	
	20:52	42 07:26 (LZ66)	20:19	23 07:14 (LZ67)	19:27	18:33	13 08:02 (LZ73)	16:48	30 08:15 (LZ74)	16:32	
13	05:39	06:44 (LZ66)	06:10	06:51 (LZ67)	06:45	07:20	07:53 (LZ73)	07:00	07:45 (LZ74)	07:34	
	20:51	42 07:26 (LZ66)	20:18	23 07:14 (LZ67)	19:25	18:31	6 07:59 (LZ73)	16:47	29 08:14 (LZ74)	16:32	
14	05:40	06:44 (LZ66)	06:12	06:50 (LZ67)	06:47	07:21		07:01	07:46 (LZ74)	07:35	
	20:50	43 07:27 (LZ66)	20:16	25 07:15 (LZ67)	19:24	18:30		16:46	27 08:13 (LZ74)	16:33	
15	05:41	06:45 (LZ66)	06:13	06:49 (LZ67)	06:48	07:23		07:03	07:48 (LZ74)	07:36	
	20:50	42 07:27 (LZ66)	20:15	26 07:15 (LZ67)	19:22	18:28		16:45	25 08:13 (LZ74)	16:33	
16	05:41	06:44 (LZ66)	06:14	06:50 (LZ67)	06:49	07:24		07:04	07:48 (LZ74)	07:37	
	20:49	42 07:26 (LZ66)	20:13	25 07:15 (LZ67)	19:20	18:26		16:44	23 08:11 (LZ74)	16:33	
17	05:42	06:44 (LZ66)	06:15	06:50 (LZ67)	06:50	07:25		07:05	07:51 (LZ74)	07:37	
	20:48	43 07:27 (LZ66)	20:12	25 07:15 (LZ67)	19:18	18:25		16:43	20 08:11 (LZ74)	16:33	
18	05:43	06:44 (LZ66)	06:16	06:50 (LZ67)	06:51	07:26		07:07	07:52 (LZ74)	07:38	
	20:48	43 07:27 (LZ66)	20:10	25 07:15 (LZ67)	19:16	18:23		16:42	17 08:09 (LZ74)	16:34	
19	05:44	06:44 (LZ66)	06:17	06:50 (LZ67)	06:52	07:28		07:08	07:54 (LZ74)	07:39	
	20:47	43 07:27 (LZ66)	20:09	24 07:14 (LZ67)	19:14	18:21		16:41	13 08:07 (LZ74)	16:34	
20	05:45	06:45 (LZ66)	06:18	06:50 (LZ67)	06:53	07:29		07:09	07:59 (LZ74)	07:39	
	20:46	42 07:27 (LZ66)	20:07	23 07:13 (LZ67)	19:13	18:20		16:41	5 08:04 (LZ74)	16:34	
21	05:46	06:45 (LZ66)	06:19	06:50 (LZ67)	06:54	07:30		07:10		07:40	
	20:45	43 07:28 (LZ66)	20:06	22 07:12 (LZ67)	19:11	18:18		16:40		16:35	
22	05:47	06:45 (LZ66)	06:21	06:51 (LZ67)	06:56	07:31		07:12		07:40	
	20:44	43 07:28 (LZ66)	20:04	20 07:11 (LZ67)	19:09	18:16		16:39		16:35	
23	05:48	06:45 (LZ66)	06:22	06:52 (LZ67)	06:57	07:33	08:56 (LZ74)	07:13		07:41	
	20:44	43 07:28 (LZ66)	20:02	18 07:10 (LZ67)	19:07	18:15	5 09:01 (LZ74)	16:38		16:36	
24	05:49	06:45 (LZ66)	06:23	06:53 (LZ67)	06:58	07:34	08:51 (LZ74)	07:14		07:41	
	20:43	43 07:28 (LZ66)	20:01	15 07:08 (LZ67)	19:05	18:13	15 09:06 (LZ74)	16:38		16:36	
25	05:50	06:46 (LZ66)	06:24	06:55 (LZ67)	06:59	06:35	07:48 (LZ74)	07:15		07:42	
	20:42	42 07:28 (LZ66)	19:59	10 07:05 (LZ67)	19:03	17:12	20 08:08 (LZ74)	16:37		16:37	
26	05:51	06:46 (LZ66)	06:25		07:00	06:36	07:47 (LZ74)	07:17		07:42	
	20:41	41 07:27 (LZ66)	19:57		19:02	17:10	23 08:10 (LZ74)	16:36		16:38	
27	05:52	06:46 (LZ66)	06:26		07:01	07:54 (LZ73)	06:38	07:45 (LZ74)	07:18	07:42	
	20:40	41 07:27 (LZ66)	19:56		19:00	12 08:06 (LZ73)	17:09	26 08:11 (LZ74)	16:36	16:38	
28	05:53	06:47 (LZ66)	06:27		07:02	07:52 (LZ73)	06:39	07:45 (LZ74)	07:19	07:43	
	20:39	40 07:27 (LZ66)	19:54		18:58	17 08:09 (LZ73)	17:07	28 08:13 (LZ74)	16:35	16:39	
29	05:54	06:47 (LZ66)	06:29		07:04	07:50 (LZ73)	06:40	07:44 (LZ74)	07:20	07:43	
	20:37	40 07:27 (LZ66)	19:52		18:56	20 08:10 (LZ73)	17:06	29 08:13 (LZ74)	16:35	16:40	
30	05:55	06:48 (LZ66)	06:30		07:05	07:49 (LZ73)	06:42	07:42 (LZ74)	07:21	07:43	
	20:36	38 07:26 (LZ66)	19:51		18:54	22 08:11 (LZ73)	17:04	32 08:14 (LZ74)	16:34	16:40	
31	05:56	06:48 (LZ66)	06:31			06:43	07:42 (LZ74)			07:43	
	20:35	37 07:25 (LZ66)	19:49			17:03	33 08:15 (LZ74)			16:41	
Potential sun hours	468		433		376	342		291		279	
Total, worst case	1269		590		71	494		562			
Sun reduction	0.59		0.65		0.59	0.47		0.36			
Oper. time red.	1.00		1.00		1.00	1.00		1.00			
Wind dir. red.	0.57		0.58		0.61	0.63		0.66			
Total reduction	0.34		0.37		0.36	0.30		0.24			
Total, real	427		219		26	148		136			

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: SeV_01 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -92.7° Slope: 90.0° (44)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March	April	May	June
1	07:44 16:42	07:28 17:19	06:48 17:57	07:20 (LZ26) 17:57	06:53 19:35	07:18 (LZ25) 20:11
2	07:44 16:43	07:27 17:21	06:47 17:58	07:19 (LZ26) 17:58	06:51 19:37	07:18 (LZ25) 20:13
3	07:44 16:44	07:26 17:22	06:45 18:00	07:19 (LZ26) 17:59	06:50 19:38	07:17 (LZ25) 20:14
4	07:44 16:45	07:24 17:23	06:43 18:01	07:18 (LZ26) 18:01	06:48 19:39	07:16 (LZ25) 20:15
5	07:44 16:46	07:23 17:25	06:41 18:02	07:17 (LZ26) 18:02	06:46 19:40	07:16 (LZ25) 20:16
6	07:44 16:47	07:22 17:26	06:40 18:03	07:17 (LZ26) 18:03	06:44 19:41	07:15 (LZ25) 20:17
7	07:44 16:48	07:21 17:28	06:38 18:05	07:17 (LZ26) 18:05	06:42 19:43	07:16 (LZ25) 20:18
8	07:44 16:49	07:20 17:29	06:36 18:06	07:17 (LZ26) 18:06	06:41 19:44	07:16 (LZ25) 20:20
9	07:43 16:50	07:18 17:30	06:35 18:07	07:17 (LZ26) 18:07	06:39 19:45	07:16 (LZ25) 20:21
10	07:43 16:51	07:17 17:32	06:33 18:09	07:17 (LZ26) 18:09	06:37 19:46	07:16 (LZ25) 20:22
11	07:43 16:52	07:16 17:33	06:31 18:10	07:18 (LZ26) 18:10	06:35 19:47	07:18 (LZ25) 20:23
12	07:42 16:53	07:14 17:34	06:29 18:11	07:18 (LZ26) 18:11	06:34 19:49	07:19 (LZ25) 20:24
13	07:42 16:55	07:13 17:36	06:27 18:12	07:19 (LZ26) 18:12	06:32 19:50	07:21 (LZ25) 20:25
14	07:42 16:56	07:12 17:37	06:26 18:14	07:20 (LZ26) 18:14	06:30 19:51	07:30 (LZ25) 20:26
15	07:41 16:57	07:10 17:38	06:24 18:15	07:22 (LZ26) 18:15	06:29 19:52	05:46 20:27
16	07:41 16:58	07:09 17:40	06:22 18:16	07:39 (LZ26) 18:16	19:52 19:53	20:27 20:29
17	07:40 16:59	07:07 17:41	06:20 18:17	07:24 (LZ26) 18:17	06:27 19:55	05:44 20:30
18	07:40 17:01	07:06 17:43	06:19 18:18	07:35 (LZ26) 18:18	06:25 19:56	05:43 20:31
19	07:39 17:02	07:04 17:44	06:17 18:20	06:24 19:57	06:24 19:57	05:42 20:32
20	07:38 17:03	07:03 17:45	06:15 18:21	06:22 19:58	06:22 19:58	05:41 20:33
21	07:38 17:05	07:01 17:47	06:13 18:22	06:20 19:59	06:20 19:59	05:40 20:34
22	07:37 17:06	07:00 17:48	06:11 18:23	06:19 20:01	06:19 20:01	05:39 20:35
23	07:36 17:07	06:58 17:49	06:09 18:25	06:17 20:02	06:17 20:02	05:38 20:36
24	07:35 17:08	06:56 17:51	06:08 18:26	06:15 20:03	06:15 20:03	05:37 20:37
25	07:35 17:10	06:55 17:52	06:06 18:27	06:14 20:04	06:14 20:04	05:36 20:38
26	07:34 17:11	06:53 17:53	06:04 18:28	06:12 20:05	06:12 20:05	05:36 20:39
27	07:33 17:12	06:52 17:54	06:02 18:29	06:11 20:06	06:11 20:06	05:35 20:40
28	07:32 17:14	06:50 17:56	06:00 18:31	06:09 20:07	06:09 20:07	06:01 (LZ13) 20:41
29	07:31 17:15	06:48 17:57	05:59 18:32	06:08 20:08	06:08 20:08	05:59 (LZ13) 20:42
30	07:30 17:17	06:46 17:59	05:57 18:33	06:06 20:09	06:06 20:09	05:57 (LZ13) 20:43
31	07:29 17:18	06:44 18:00	05:55 18:34	06:05 20:10	06:05 20:10	05:55 (LZ13) 20:44
Potential sun hours	289	293	369	402	456	462
Total, worst case		85	496	284	60	698
Sun reduction		0.29	0.31	0.40	0.47	0.49
Oper. time red.		1.00	1.00	1.00	1.00	1.00
Wind dir. red.		0.62	0.62	0.61	0.60	0.60
Total reduction		0.18	0.19	0.24	0.28	0.30
Total, real		15	93	68	17	208

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: SeV_01 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -92.7° Slope: 90.0° (44)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

July			August			September			October			November			December		
1	05:31		05:59 (LZ13)	05:57		06:32		07:17 (LZ25)	07:06		07:57 (LZ26)	06:44		07:23			
	20:56	23	06:22 (LZ13)	20:34		19:47	18	07:35 (LZ25)	18:53		08:23 (LZ26)	17:02		16:34			
2	05:31		05:58 (LZ13)	05:58		06:33		07:15 (LZ25)	07:07		07:56 (LZ26)	06:46		07:24			
	20:56	24	06:22 (LZ13)	20:33		19:45	21	07:36 (LZ25)	18:51	28	08:24 (LZ26)	17:00		16:34			
3	05:32		05:59 (LZ13)	05:59		06:34		07:14 (LZ25)	07:08		07:56 (LZ26)	06:47		07:25			
	20:55	23	06:22 (LZ13)	20:32		19:44	23	07:37 (LZ25)	18:49	29	08:25 (LZ26)	16:59		16:33			
4	05:33		06:00 (LZ13)	06:00		06:35		07:13 (LZ25)	07:10		07:55 (LZ26)	06:48		07:26			
	20:55	23	06:23 (LZ13)	20:31		19:42	24	07:37 (LZ25)	18:47	30	08:25 (LZ26)	16:58		16:33			
5	05:33		06:00 (LZ13)	06:02		06:36		07:12 (LZ25)	07:11		07:54 (LZ26)	06:50		07:27			
	20:55	22	06:22 (LZ13)	20:29		19:40	25	07:37 (LZ25)	18:45	31	08:25 (LZ26)	16:56		16:33			
6	05:34		06:00 (LZ13)	06:03		06:38		07:11 (LZ25)	07:12		07:53 (LZ26)	06:51		07:28			
	20:55	23	06:23 (LZ13)	20:28		19:38	26	07:37 (LZ25)	18:44	32	08:25 (LZ26)	16:55		16:33			
7	05:34		06:01 (LZ13)	06:04		06:39		07:11 (LZ25)	07:13		07:52 (LZ26)	06:52		07:29			
	20:54	22	06:23 (LZ13)	20:27		19:37	25	07:36 (LZ25)	18:42	33	08:25 (LZ26)	16:54		16:32			
8	05:35		06:01 (LZ13)	06:05		06:40		07:10 (LZ25)	07:14		07:53 (LZ26)	06:54		07:30			
	20:54	21	06:22 (LZ13)	20:25		19:35	26	07:36 (LZ25)	18:40	32	08:25 (LZ26)	16:53		16:32			
9	05:36		06:02 (LZ13)	06:06		06:41		07:11 (LZ25)	07:16		07:53 (LZ26)	06:55		07:31			
	20:53	20	06:22 (LZ13)	20:24		19:33	25	07:36 (LZ25)	18:38	31	08:24 (LZ26)	16:52		16:32			
10	05:37		06:03 (LZ13)	06:07		06:42		07:11 (LZ25)	07:17		07:53 (LZ26)	06:56		07:32			
	20:53	19	06:22 (LZ13)	20:23		19:31	24	07:35 (LZ25)	18:37	31	08:24 (LZ26)	16:50		16:32			
11	05:37		06:03 (LZ13)	06:08		06:43		07:11 (LZ25)	07:18		07:53 (LZ26)	06:58		07:33			
	20:52	18	06:21 (LZ13)	20:21		19:29	23	07:34 (LZ25)	18:35	29	08:22 (LZ26)	16:49		16:32			
12	05:38		06:04 (LZ13)	06:09		06:44		07:12 (LZ25)	07:19		07:54 (LZ26)	06:59		07:34			
	20:52	17	06:21 (LZ13)	20:20		19:27	21	07:33 (LZ25)	18:33	28	08:22 (LZ26)	16:48		16:32			
13	05:39		06:05 (LZ13)	06:10		06:46		07:13 (LZ25)	07:20		07:54 (LZ26)	07:00		07:35			
	20:51	15	06:20 (LZ13)	20:18		19:26	18	07:31 (LZ25)	18:31	27	08:21 (LZ26)	16:47		16:32			
14	05:40		06:06 (LZ13)	06:12		06:47		07:14 (LZ25)	07:22		07:55 (LZ26)	07:02		07:35			
	20:51	14	06:20 (LZ13)	20:17		19:24	15	07:29 (LZ25)	18:30	24	08:19 (LZ26)	16:46		16:33			
15	05:41		06:07 (LZ13)	06:13		06:48		07:17 (LZ25)	07:23		07:56 (LZ26)	07:03		07:36			
	20:50	12	06:19 (LZ13)	20:15		19:22	8	07:25 (LZ25)	18:28	21	08:17 (LZ26)	16:45		16:33			
16	05:41		06:08 (LZ13)	06:14		06:49			07:24		07:58 (LZ26)	07:04		07:37			
	20:49	9	06:17 (LZ13)	20:14		19:20			18:26	18	08:16 (LZ26)	16:44		16:33			
17	05:42		06:12 (LZ13)	06:15		06:50			07:25		08:01 (LZ26)	07:06		07:38			
	20:49	2	06:14 (LZ13)	20:12		19:18			18:25	11	08:12 (LZ26)	16:43		16:33			
18	05:43			06:16		06:51			07:27			07:07		07:38			
	20:48			20:11		19:16			18:23			16:42		16:34			
19	05:44			06:17		06:52			07:28			07:08		07:39			
	20:47			20:09		19:15			18:21			16:41		16:34			
20	05:45			06:18		06:53			07:29			07:09		07:39			
	20:46			20:07		19:13			18:20			16:41		16:34			
21	05:46			06:20		06:55			07:30			07:11		07:40			
	20:46			20:06		19:11			18:18			16:40		16:35			
22	05:47			06:21		06:56			07:32			07:12		07:41			
	20:45			20:04		19:09			18:16			16:39		16:35			
23	05:48			06:22		06:57			07:33			07:13		07:41			
	20:44			20:03		19:07			18:15			16:38		16:36			
24	05:49			06:23		06:58			07:34			07:14		07:42			
	20:43			20:01		19:05			18:13			16:38		16:36			
25	05:50			06:24		06:59			06:35			07:16		07:42			
	20:42			19:59		19:04			17:12			16:37		16:37			
26	05:51			06:25		07:00			06:37			07:17		07:42			
	20:41			19:58		19:02			17:10			16:36		16:38			
27	05:52			06:26		07:01		08:09 (LZ26)	06:38			07:18		07:43			
	20:40			19:56		19:00	7	08:16 (LZ26)	17:09			16:36		16:38			
28	05:53			06:27		07:03		08:04 (LZ26)	06:39			07:19		07:43			
	20:39			19:54		18:58	15	08:19 (LZ26)	17:07			16:35		16:39			
29	05:54			06:29		07:04		08:01 (LZ26)	06:41			07:20		07:43			
	20:38			19:52		18:56	20	08:21 (LZ26)	17:06			16:35		16:40			
30	05:55			06:30		07:22 (LZ25)		07:59 (LZ26)	06:42			07:22		07:43			
	20:37			19:51	9	07:31 (LZ25)	18:54	24	08:23 (LZ26)			16:34		16:40			
31	05:56			06:31		07:19 (LZ25)			06:43					07:44			
	20:35			19:49	15	07:34 (LZ25)			17:03					16:41			
Potential sun hours	468			433		376			342			291		279			
Total, worst case		307			24		388		461								
Sun reduction		0.59			0.65		0.59		0.47								
Oper. time red.		1.00			1.00		1.00		1.00								
Wind dir. red.		0.60			0.61		0.61		0.62								
Total reduction		0.35			0.39		0.36		0.29								
Total, real		108			9		140		134								

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: SeV_02 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -92.0° Slope: 90.0° (45)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:44 16:42	07:28 17:19	06:48 17:57	06:53 19:35	06:03 20:11	05:31 20:44	05:31 20:56	05:57 20:34	06:32 19:47	07:04 (LZ25) 18:53	07:06 18:53	07:46 (LZ26) 17:02	07:23 16:34
2	07:44 16:43	07:27 17:21	06:47 17:58	06:51 19:37	06:02 20:13	05:31 20:45	05:31 20:56	05:58 20:33	06:33 19:45	07:04 (LZ25) 18:51	07:07 18:51	07:46 (LZ26) 17:00	07:24 16:34
3	07:44 16:44	07:26 17:22	06:45 18:00	06:50 19:38	06:00 20:14	05:30 20:46	05:33 20:55	05:59 20:32	06:34 19:44	07:04 (LZ25) 18:50	07:08 18:49	07:47 (LZ26) 16:59	07:25 16:33
4	07:44 16:45	07:24 17:23	06:43 18:01	06:48 19:39	06:00 20:15	05:30 20:47	05:33 20:55	06:00 20:31	06:35 19:42	07:05 (LZ25) 18:47	07:10 18:47	07:47 (LZ26) 16:58	07:26 16:33
5	07:44 16:46	07:23 17:25	06:41 18:02	06:46 19:40	06:00 20:16	05:29 20:47	05:33 20:55	06:02 20:29	06:36 19:40	07:05 (LZ25) 18:45	07:11 18:45	07:48 (LZ26) 16:56	07:27 16:33
6	07:44 16:47	07:22 17:26	06:40 18:03	06:40 19:41	06:00 20:17	05:28 20:48	05:34 20:55	06:03 20:28	06:38 19:38	07:07 (LZ25) 18:44	07:12 18:44	07:48 (LZ26) 16:55	07:28 16:33
7	07:44 16:48	07:21 17:28	06:38 18:05	06:42 19:42	06:00 20:18	05:28 20:49	05:34 20:54	06:04 20:27	06:39 19:37	07:09 (LZ25) 18:42	07:13 18:42	07:49 (LZ26) 16:54	07:29 16:32
8	07:44 16:49	07:20 17:29	06:36 18:06	06:40 19:43	06:00 20:19	05:27 20:49	05:35 20:54	06:05 20:25	06:40 19:35	07:10 (LZ25) 18:40	07:14 18:39	07:51 (LZ26) 16:53	07:30 16:32
9	07:43 16:50	07:18 17:30	06:35 18:07	06:39 19:45	06:00 20:20	05:28 20:50	06:06 20:53	06:06 20:24	06:41 19:33	07:16 18:38	07:16 18:38	07:53 (LZ26) 16:52	07:31 16:32
10	07:43 16:51	07:17 17:32	06:33 18:09	06:37 19:46	06:00 20:21	05:28 20:51	06:07 20:53	06:07 20:23	06:42 19:31	07:17 18:37	07:17 18:37	07:56 (LZ26) 16:50	07:32 16:32
11	07:43 16:52	07:16 17:33	06:31 18:10	06:35 19:47	06:00 20:22	05:27 20:51	06:08 20:52	06:08 20:21	06:43 19:29	07:18 18:35	07:18 18:35	08:07 (LZ26) 16:49	07:33 16:32
12	07:42 16:53	07:14 17:34	06:29 18:11	06:34 19:49	06:00 20:23	05:27 20:52	06:09 20:53	06:09 20:20	06:44 19:27	07:19 18:33	07:19 18:33	08:07 (LZ26) 16:48	07:34 16:32
13	07:42 16:55	07:13 17:36	06:27 18:12	06:32 19:50	06:00 20:24	05:27 20:53	06:10 20:51	06:06 20:18	06:46 19:26	07:20 (LZ25) 18:31	07:20 18:31	08:08 (LZ26) 16:47	07:35 16:32
14	07:42 16:56	07:12 17:37	06:26 18:14	06:30 19:51	06:00 20:25	05:27 20:54	06:12 20:51	06:12 20:17	06:47 19:24	07:22 (LZ25) 18:30	07:22 18:30	08:09 (LZ26) 16:46	07:36 16:33
15	07:41 16:57	07:10 17:38	06:24 18:15	06:29 19:52	06:00 20:26	05:27 20:55	06:13 20:50	06:13 20:15	06:48 19:22	07:23 (LZ25) 18:28	07:23 18:28	08:10 (LZ26) 16:45	07:37 16:33
16	07:41 16:58	07:09 17:40	06:22 18:16	06:27 19:53	06:00 20:27	05:27 20:56	06:14 20:49	06:14 20:15	06:49 19:20	07:24 (LZ25) 18:26	07:24 18:26	08:11 (LZ26) 16:44	07:37 16:33
17	07:40 16:59	07:07 17:41	06:20 18:17	06:25 19:55	06:00 20:28	05:27 20:57	06:15 20:49	06:15 20:12	06:50 19:18	07:25 (LZ25) 18:25	07:25 18:25	08:12 (LZ26) 16:43	07:38 16:33
18	07:40 17:01	07:06 17:43	06:18 18:18	06:24 19:56	06:00 20:29	05:27 20:58	06:16 20:48	06:16 20:11	06:51 19:16	07:26 (LZ25) 18:23	07:27 18:23	08:13 (LZ26) 16:42	07:39 16:34
19	07:39 17:02	07:04 17:44	06:17 18:20	06:22 19:57	06:00 20:30	05:27 20:59	06:17 20:47	06:17 20:09	06:52 19:15	07:27 (LZ25) 18:21	07:28 18:21	08:14 (LZ26) 16:41	07:40 16:34
20	07:38 17:03	07:03 17:45	06:15 18:21	06:20 19:58	06:00 20:31	05:27 20:60	06:18 20:46	06:18 20:07	06:53 19:13	07:28 (LZ25) 18:20	07:29 18:20	08:15 (LZ26) 16:41	07:41 16:34
21	07:38 17:05	07:01 17:47	06:13 18:22	06:19 19:59	06:00 20:32	05:27 20:61	06:19 20:46	06:19 20:06	06:55 19:11	07:29 (LZ25) 18:18	07:30 18:18	08:16 (LZ26) 16:40	07:42 16:35
22	07:37 17:06	07:00 17:48	06:11 18:23	06:17 20:01	06:00 20:33	05:27 20:62	06:21 20:45	06:21 20:04	06:56 19:09	07:30 (LZ25) 18:16	07:32 18:16	08:17 (LZ26) 16:39	07:43 16:35
23	07:36 17:07	06:58 17:49	06:09 18:25	06:15 20:02	06:00 20:34	05:27 20:63	06:22 20:46	06:22 20:03	06:57 19:07	07:31 (LZ25) 18:15	07:33 18:15	08:18 (LZ26) 16:38	07:44 16:36
24	07:35 17:08	06:56 17:51	06:08 18:26	06:14 20:03	06:00 20:35	05:27 20:64	06:23 20:47	06:23 20:04	06:58 19:05	07:32 (LZ25) 18:13	07:34 18:13	08:19 (LZ26) 16:37	07:45 16:36
25	07:35 17:10	06:55 17:52	06:06 18:27	06:12 20:04	06:00 20:36	05:28 20:65	06:24 20:48	06:24 20:05	06:59 19:04	07:33 (LZ25) 18:12	07:35 18:12	08:20 (LZ26) 16:36	07:46 16:37
26	07:34 17:11	06:53 17:53	06:04 18:28	06:11 20:05	06:00 20:37	05:29 20:66	06:25 20:49	06:25 20:06	07:00 19:03	07:34 (LZ25) 18:11	07:36 18:11	08:21 (LZ26) 16:35	07:47 16:38
27	07:33 17:12	06:52 17:54	06:02 18:29	06:09 20:07	06:00 20:38	05:29 20:67	06:26 20:50	06:26 20:07	07:01 19:00	07:35 (LZ25) 18:10	07:37 18:10	08:22 (LZ26) 16:34	07:48 16:39
28	07:32 17:14	06:50 17:56	06:00 18:31	06:08 20:08	06:00 20:39	05:29 20:68	06:27 20:51	06:27 20:08	07:01 19:01	07:36 (LZ25) 18:09	07:38 18:09	08:23 (LZ26) 16:33	07:49 16:40
29	07:31 17:15	06:49 17:59	06:59 19:32	06:06 20:09	06:00 20:40	05:30 20:69	06:29 20:52	06:29 20:10	07:02 19:02	07:37 (LZ25) 18:08	07:40 18:08	08:24 (LZ26) 16:32	07:50 16:41
30	07:30 17:17	06:47 18:00	06:57 19:33	06:05 20:10	06:00 20:41	05:30 20:70	06:30 20:53	06:30 20:11	07:03 19:03	07:38 (LZ25) 18:07	07:42 18:07	08:25 (LZ26) 16:31	07:51 16:42
31	07:29 17:18	06:46 18:01	06:55 19:34	06:05 20:11	06:00 20:42	05:30 20:71	06:31 20:54	06:31 20:12	07:04 19:04	07:39 (LZ25) 18:06	07:43 18:06	08:26 (LZ26) 16:30	07:52 16:43
Potential sun hours	289	293	369	402	456	462	468	433	376	342	291	279	
Total, worst case			616							503	269		
Sun reduction			0.31		403				264	0.59	0.47		
Oper. time red.			1.00		0.40				0.65	1.00	1.00		
Wind dir. red.			0.61		0.60				0.60	0.61	0.61		
Total reduction			0.19		0.24				0.39	0.36	0.29		
Total, real			0.16		95				102	181	78		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: SeV_03 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -92.6° Slope: 90.0° (46)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

January		February		March		April		May		June	
1	07:44 16:42	07:28 17:19	08:03 (LZ35) 08:24 (LZ35)	06:48 17:57		06:53 19:35	07:53 (LZ26) 08:26 (LZ26)	06:03 20:11	06:49 (LZ25) 07:15 (LZ25)	05:31 20:44	
2	07:44 16:43	07:27 17:21	08:04 (LZ35) 08:24 (LZ35)	06:47 17:58		06:51 19:37	07:55 (LZ26) 08:25 (LZ26)	06:02 20:13	06:49 (LZ25) 07:13 (LZ25)	05:31 20:45	
3	07:44 16:44	07:26 17:22	08:05 (LZ35) 08:24 (LZ35)	06:45 18:00		06:50 19:38	07:55 (LZ26) 08:23 (LZ26)	06:00 20:14	06:50 (LZ25) 07:12 (LZ25)	05:30 20:46	
4	07:44 16:45	07:24 17:23	08:05 (LZ35) 08:22 (LZ35)	06:43 18:01		06:48 19:39	07:57 (LZ26) 08:21 (LZ26)	05:59 20:15	06:51 (LZ25) 07:10 (LZ25)	05:30 20:47	
5	07:44 16:46	07:23 17:25	08:06 (LZ35) 08:21 (LZ35)	06:41 18:02		06:46 19:40	07:58 (LZ26) 08:18 (LZ26)	05:58 20:16	06:53 (LZ25) 07:09 (LZ25)	05:29 20:47	
6	07:44 16:47	07:22 17:26	08:09 (LZ35) 08:20 (LZ35)	06:40 18:03		06:44 19:41	08:01 (LZ26) 08:14 (LZ26)	05:56 20:17	06:55 (LZ25) 07:07 (LZ25)	05:29 20:48	
7	07:44 16:48	07:21 17:27	08:12 (LZ35) 08:17 (LZ35)	06:38 18:05		06:42 19:43		05:55 20:18	07:00 (LZ25) 07:02 (LZ25)	05:28 20:49	
8	07:44 16:49	07:20 17:29		06:36 18:06		06:41 19:44		05:54 20:20		05:28 20:49	
9	07:43 16:50	07:18 17:30		06:35 18:07		06:39 19:45		05:52 20:21		05:28 20:50	
10	07:43 16:51	07:17 17:32		06:33 18:09		06:37 19:46		05:51 20:22		05:28 20:51	
11	07:43 16:52	07:16 17:33		06:31 18:10		06:35 19:47		05:50 20:23		05:27 20:51	
12	07:42 16:53	07:14 17:34		06:29 18:11		06:34 19:49		05:49 20:24		05:27 20:52	
13	07:42 16:55	07:13 17:36		06:27 18:12	07:10 (LZ26)	06:32 19:50		05:48 20:25		05:27 20:52	
14	07:42 16:56	07:12 17:37		06:26 18:14	07:06 (LZ26)	06:30 19:51		05:46 20:26		05:27 20:53	
15	07:41 16:57	07:10 17:38		06:24 18:15	07:03 (LZ26)	06:29 19:52	07:00 (LZ25)	05:45 20:27		05:27 20:53	
16	07:41 16:58	07:09 17:40		06:22 18:16	07:01 (LZ26)	06:27 19:53	07:09 (LZ25)	05:44 20:29		05:27 20:54	
17	07:40 16:59	07:07 17:41		06:20 18:17	07:29 (LZ26)	06:25 19:55	06:56 (LZ25)	05:43 20:30		05:27 20:54	
18	07:40 17:01	07:06 17:43		06:18 18:18	07:00 (LZ26)	06:24 19:56	06:55 (LZ25)	05:42 20:31		05:27 20:54	
19	07:39 17:02	08:06 (LZ35) 08:14 (LZ35)	07:04 17:44	06:17 18:20	06:58 (LZ26) 07:32 (LZ26)	06:22 19:57	06:53 (LZ25) 07:15 (LZ25)	05:41 20:32		05:27 20:55	
20	07:38 17:03	08:05 (LZ35) 08:17 (LZ35)	07:03 17:45	06:15 18:21	06:57 (LZ26) 07:32 (LZ26)	06:22 19:58	06:51 (LZ25) 07:17 (LZ25)	05:41 20:33		05:27 20:55	
21	07:38 17:05	08:04 (LZ35) 08:18 (LZ35)	07:01 17:47	06:13 18:22	06:55 (LZ26) 07:32 (LZ26)	06:20 19:59	06:51 (LZ25) 07:17 (LZ25)	05:40 20:34		05:27 20:55	
22	07:37 17:06	08:03 (LZ35) 08:19 (LZ35)	07:00 17:48	06:11 18:23	06:54 (LZ26) 07:33 (LZ26)	06:17 20:01	06:49 (LZ25) 07:18 (LZ25)	05:38 20:35		05:28 20:55	
23	07:36 17:07	08:02 (LZ35) 08:20 (LZ35)	06:58 17:49	06:09 18:25	06:54 (LZ26) 07:33 (LZ26)	06:15 20:02	06:48 (LZ25) 07:17 (LZ25)	05:37 20:36		05:28 20:56	
24	07:35 17:08	08:02 (LZ35) 08:21 (LZ35)	06:56 17:51	06:08 18:26	06:53 (LZ26) 07:33 (LZ26)	06:14 20:03	06:48 (LZ25) 07:18 (LZ25)	05:37 20:37		05:28 20:56	
25	07:35 17:10	08:22 (LZ35) 08:02 (LZ35)	06:55 17:52	06:06 18:27	06:52 (LZ26) 07:32 (LZ26)	06:12 20:04	06:47 (LZ25) 07:17 (LZ25)	05:36 20:38		05:28 20:56	
26	07:34 17:11	08:01 (LZ35) 08:22 (LZ35)	06:53 17:53	06:04 18:28	06:52 (LZ26) 07:31 (LZ26)	06:11 20:05	06:48 (LZ25) 07:17 (LZ25)	05:35 20:39		05:29 20:56	
27	07:33 17:12	08:01 (LZ35) 08:23 (LZ35)	06:52 17:54	06:02 18:29	06:52 (LZ26) 07:31 (LZ26)	06:09 20:07	06:47 (LZ25) 07:16 (LZ25)	05:34 20:40		05:29 20:56	
28	07:32 17:14	08:01 (LZ35) 08:23 (LZ35)	06:50 17:56	06:00 18:31	06:52 (LZ26) 07:31 (LZ26)	06:08 20:08	06:48 (LZ25) 07:16 (LZ25)	05:34 20:41		05:29 20:56	
29	07:31 17:15	08:01 (LZ35) 08:24 (LZ35)		06:59 19:32	07:52 (LZ26) 08:30 (LZ26)	06:06 20:09	06:47 (LZ25) 07:15 (LZ25)	05:33 20:42		05:30 20:56	
30	07:30 17:17	08:02 (LZ35) 08:24 (LZ35)		06:57 19:33	07:52 (LZ26) 08:29 (LZ26)	06:05 20:10	06:48 (LZ25) 07:15 (LZ25)	05:32 20:42		05:30 20:56	
31	07:29 17:18	08:02 (LZ35) 08:24 (LZ35)		06:55 19:34	07:53 (LZ26) 08:27 (LZ26)			05:32 20:43			
Potential sun hours	289	293		369	402			456		462	
Total, worst case	239	108		645	552			121			
Sun reduction	0.28	0.29		0.31	0.40			0.47			
Oper. time red.	1.00	1.00		1.00	1.00			1.00			
Wind dir. red.	0.66	0.66		0.62	0.59			0.58			
Total reduction	0.19	0.19		0.19	0.23			0.27			
Total, real	44	21		121	129			33			

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: SeV_03 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -92.6° Slope: 90.0° (46)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:56	05:57 20:34	06:32 19:47	07:06 18:53	07:52 (LZ26) 07:58 (LZ26)	06:44 17:02
2	05:31 20:56	05:58 20:33	06:33 19:45	07:07 18:51		06:46 17:00
3	05:32 20:55	05:59 20:32	06:34 19:44	07:08 18:49		06:47 16:59
4	05:33 20:55	06:00 20:31	06:35 19:42	07:10 18:47		06:48 16:58
5	05:33 20:55	06:02 20:29	06:36 19:40	07:11 18:45		06:50 16:56
6	05:34 20:55	06:03 20:28	07:07 (LZ25) 07:14 (LZ25)	07:57 (LZ26) 08:10 (LZ26)	12 15	07:50 (LZ35) 07:36 (LZ35)
7	05:34 20:54	06:04 20:27	06:39 19:37	07:13 18:42		06:51 16:54
8	05:35 20:54	06:05 20:25	07:02 (LZ25) 07:19 (LZ25)	07:14 18:40		06:52 16:53
9	05:36 20:53	06:06 20:24	07:00 (LZ25) 07:20 (LZ25)	07:16 18:38		06:53 16:52
10	05:37 20:53	06:07 20:23	06:59 (LZ25) 07:21 (LZ25)	07:17 18:37		06:54 16:51
11	05:37 20:52	06:08 20:21	06:58 (LZ25) 07:22 (LZ25)	07:18 18:35		06:55 16:49
12	05:38 20:52	06:09 20:20	06:57 (LZ25) 07:22 (LZ25)	07:19 18:33		06:56 16:48
13	05:39 20:51	06:10 20:18	06:56 (LZ25) 07:23 (LZ25)	07:20 18:31		06:57 16:47
14	05:40 20:51	06:12 20:17	06:55 (LZ25) 07:23 (LZ25)	07:22 18:30		07:00 16:46
15	05:41 20:50	06:13 20:15	06:55 (LZ25) 07:24 (LZ25)	07:23 18:28		07:02 16:45
16	05:41 20:49	06:14 20:14	06:55 (LZ25) 07:24 (LZ25)	07:24 18:26		07:03 16:44
17	05:42 20:49	06:15 20:12	06:55 (LZ25) 07:24 (LZ25)	07:25 18:25		07:04 16:43
18	05:43 20:48	06:16 20:11	06:54 (LZ25) 07:24 (LZ25)	07:27 18:23		07:05 16:42
19	05:44 20:47	06:17 20:09	06:54 (LZ25) 07:24 (LZ25)	07:28 18:21		07:06 16:41
20	05:45 20:46	06:18 20:07	06:53 (LZ25) 07:23 (LZ25)	07:29 18:20		07:07 16:41
21	05:46 20:46	06:20 20:06	06:54 (LZ25) 07:22 (LZ25)	07:30 18:18		07:08 16:40
22	05:47 20:45	06:21 20:04	06:54 (LZ25) 07:22 (LZ25)	07:32 18:16		07:12 16:39
23	05:48 20:44	06:22 20:03	06:55 (LZ25) 07:21 (LZ25)	07:33 18:15		07:13 16:38
24	05:49 20:43	06:23 20:01	06:55 (LZ25) 07:19 (LZ25)	07:34 18:13		07:14 16:38
25	05:50 20:42	06:24 19:59	06:56 (LZ25) 07:18 (LZ25)	07:35 18:12		07:16 16:37
26	05:51 20:41	06:25 19:58	06:57 (LZ25) 07:16 (LZ25)	07:37 18:10		07:17 16:36
27	05:52 20:40	06:26 19:56	06:59 (LZ25) 07:14 (LZ25)	07:38 18:09		07:18 16:36
28	05:53 20:39	06:27 19:54	07:02 (LZ25) 07:11 (LZ25)	07:39 18:07		07:19 16:35
29	05:54 20:38	06:29 19:52	07:04 18:56	07:45 (LZ26) 08:07 (LZ26)		07:20 16:35
30	05:55 20:37	06:30 19:51	07:05 18:54	07:48 (LZ26) 08:04 (LZ26)		07:22 16:34
31	05:56 20:35	06:31 19:49		06:43 17:03		07:23 16:41
Potential sun hours	468	433	376	342	291	279
Total, worst case		530	797	6	350	
Sun reduction		0.65	0.59	0.47	0.36	
Oper. time red.		1.00	1.00	1.00	1.00	
Wind dir. red.		0.58	0.62	0.62	0.66	
Total reduction		0.38	0.36	0.29	0.24	
Total, real		199	291	2	84	

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: SeV_04 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -91.0° Slope: 90.0° (47)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January			February			March			April			May			June		
	1	07:44 16:42		07:28 17:19	20	07:56 (LZ35) 08:16 (LZ35)	06:48 17:57		06:53 19:35	37	07:35 (LZ26) 08:12 (LZ26)	06:03 20:11	27	06:36 (LZ25) 07:03 (LZ25)	05:31 20:44			
	2	07:44 16:43		07:27 17:21	22	07:55 (LZ35) 08:17 (LZ35)	06:47 17:58		06:51 19:37	38	07:35 (LZ26) 08:13 (LZ26)	06:02 20:13	28	06:35 (LZ25) 07:03 (LZ25)	05:31 20:45			
	3	07:44 16:44		07:26 17:22	22	07:55 (LZ35) 08:17 (LZ35)	06:45 18:00		06:50 19:38	39	07:34 (LZ26) 08:13 (LZ26)	06:00 20:14	29	06:34 (LZ25) 07:03 (LZ25)	05:30 20:46			
	4	07:44 16:45		07:24 17:23	23	07:54 (LZ35) 08:17 (LZ35)	06:43 18:01		06:48 19:39	40	07:33 (LZ26) 08:13 (LZ26)	05:59 20:15	30	06:33 (LZ25) 07:03 (LZ25)	05:30 20:47			
	5	07:44 16:46		07:23 17:25	22	07:55 (LZ35) 08:17 (LZ35)	06:41 18:02		06:46 19:40	41	07:32 (LZ26) 08:13 (LZ26)	05:58 20:16	30	06:33 (LZ25) 07:03 (LZ25)	05:29 20:47			
	6	07:44 16:47		07:22 17:26	23	07:55 (LZ35) 08:18 (LZ35)	06:40 18:03		06:44 19:41	41	07:31 (LZ26) 08:12 (LZ26)	05:56 20:17	30	06:33 (LZ25) 07:03 (LZ25)	05:29 20:48			
	7	07:44 16:48		07:21 17:27	22	07:56 (LZ35) 08:18 (LZ35)	06:38 18:05		06:42 19:43	41	07:32 (LZ26) 08:13 (LZ26)	05:55 20:18	29	06:34 (LZ25) 07:03 (LZ25)	05:28 20:49			
	8	07:44 16:49		07:20 17:29	22	07:55 (LZ35) 08:17 (LZ35)	06:36 18:06		06:41 19:44	41	07:31 (LZ26) 08:12 (LZ26)	05:54 20:20	29	06:33 (LZ25) 07:02 (LZ25)	05:28 20:49			
	9	07:43 16:50		07:18 17:30	21	07:56 (LZ35) 08:17 (LZ35)	06:35 18:07		06:39 19:45	40	07:31 (LZ26) 08:11 (LZ26)	05:52 20:21	29	06:33 (LZ25) 07:02 (LZ25)	05:28 20:50			
	10	07:43 16:51		07:17 17:32	19	07:57 (LZ35) 08:16 (LZ35)	06:33 18:09		06:37 19:46	39	07:31 (LZ26) 08:10 (LZ26)	05:51 20:22	28	06:34 (LZ25) 07:02 (LZ25)	05:28 20:51			
	11	07:43 16:52		07:16 17:33	17	07:58 (LZ35) 08:15 (LZ35)	06:31 18:10		06:35 19:47	38	07:32 (LZ26) 08:10 (LZ26)	05:50 20:23	28	06:34 (LZ25) 07:02 (LZ25)	05:27 20:51			
	12	07:42 16:53		07:14 17:34	14	08:00 (LZ35) 08:14 (LZ35)	06:29 18:11		06:34 19:49	37	07:32 (LZ26) 08:09 (LZ26)	05:49 20:24	26	06:35 (LZ25) 07:01 (LZ25)	05:27 20:52			
	13	07:42 16:55		07:13 17:36	10	08:01 (LZ35) 08:11 (LZ35)	06:27 18:12		06:32 19:50	35	07:32 (LZ26) 08:07 (LZ26)	05:48 20:25	26	06:35 (LZ25) 07:01 (LZ25)	05:27 20:52			
	14	07:42 16:56		07:12 17:37			06:26 18:14		06:30 19:51	34	07:33 (LZ26) 08:07 (LZ26)	05:46 20:26	24	06:36 (LZ25) 07:00 (LZ25)	05:27 20:53			
	15	07:41 16:57		07:10 17:38			06:24 18:15		06:29 19:52	32	07:33 (LZ26) 08:05 (LZ26)	05:45 20:27	23	06:37 (LZ25) 07:00 (LZ25)	05:27 20:53			
	16	07:41 16:58		07:09 17:40			06:22 18:16		06:27 19:53	29	07:34 (LZ26) 08:03 (LZ26)	05:44 20:29	22	06:37 (LZ25) 06:59 (LZ25)	05:27 20:54			
	17	07:40 16:59		07:07 17:41			06:20 18:17		06:25 19:55	26	07:36 (LZ26) 08:02 (LZ26)	05:43 20:30	20	06:38 (LZ25) 06:58 (LZ25)	05:27 20:54			
	18	07:40 17:01		07:06 17:43			06:18 18:18		06:24 19:56	23	07:37 (LZ26) 08:00 (LZ26)	05:42 20:31	16	06:40 (LZ25) 06:56 (LZ25)	05:27 20:54			
	19	07:39 17:02		07:04 17:44			06:17 18:20		06:22 19:57	19	07:38 (LZ26) 07:57 (LZ26)	05:41 20:32	14	06:41 (LZ25) 06:55 (LZ25)	05:27 20:55			
	20	07:38 17:03		07:03 17:45			06:15 18:21		06:20 19:58	12	07:42 (LZ26) 07:54 (LZ26)	05:40 20:33	10	06:43 (LZ25) 06:53 (LZ25)	05:27 20:55			
	21	07:38 17:05		07:01 17:47			06:13 18:22		06:19 19:59			05:39 20:34			05:27 20:55			
	22	07:37 17:06		07:00 17:48			06:11 18:23		06:17 20:01			05:38 20:35			05:28 20:55			
	23	07:36 17:07		06:58 17:49			06:09 18:25		06:15 20:02			05:37 20:36			05:28 20:56			
	24	07:35 17:08		06:56 17:51			06:08 18:26		06:14 20:03			05:37 20:37			05:28 20:56			
	25	07:35 17:10		06:55 17:52			06:06 18:27	11	06:12 20:04		06:45 (LZ25) 06:54 (LZ25)	05:36 20:38			05:28 20:56			
	26	07:34 17:11		06:53 17:53			06:04 18:28	19	06:11 20:05	15	06:46 (LZ26) 07:05 (LZ26)	05:35 20:39			05:29 20:56			
	27	07:33 17:12	6	06:52 17:54		08:01 (LZ35) 08:07 (LZ35)	06:02 17:54	24	06:09 20:07	19	06:43 (LZ26) 07:07 (LZ26)	05:34 20:40			05:29 20:56			
	28	07:32 17:14	11	06:50 17:56		07:59 (LZ35) 08:10 (LZ35)	06:00 18:31	28	06:08 20:08	21	06:39 (LZ25) 07:10 (LZ26)	05:34 20:41			05:29 20:56			
	29	07:31 17:15	14	06:59 18:12		07:58 (LZ35) 08:12 (LZ35)	06:59 19:32	31	06:06 20:09	24	06:37 (LZ25) 07:01 (LZ25)	05:33 20:42			05:30 20:56			
	30	07:30 17:17	16	06:57 18:13		07:57 (LZ35) 08:13 (LZ35)	06:57 19:33	33	06:05 20:10	26	06:36 (LZ25) 07:02 (LZ25)	05:32 20:42			05:30 20:56			
	31	07:29 17:18	19	06:56 18:15		07:56 (LZ35) 08:15 (LZ35)	06:55 19:34	36	06:05 20:12		07:36 (LZ26) 08:12 (LZ26)	05:32 20:43						
Potential sun hours		289		293			369		402			456			462			
Total, worst case		66		257			182		796			498						
Sun reduction		0.28		0.29			0.31		0.40			0.47						
Oper. time red.		1.00		1.00			1.00		1.00			1.00						
Wind dir. red.		0.66		0.66			0.61		0.61			0.57						
Total reduction		0.18		0.19			0.19		0.24			0.27						
Total, real		12		49			34		191			132						

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: SeV_04 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -91.0° Slope: 90.0° (47)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

July				August				September				October				November				December	
1	05:31			05:57		06:45 (LZ25)	06:32		07:31 (LZ26)	07:06				06:44		07:26 (LZ35)	07:23				
	20:56			20:34	27	07:12 (LZ25)	19:47	38	08:09 (LZ26)	18:53				17:02	19	07:45 (LZ35)	16:34				
2	05:31			05:58		06:44 (LZ25)	06:33		07:30 (LZ26)	07:07				06:46		07:26 (LZ35)	07:24				
	20:56			20:33	29	07:13 (LZ25)	19:45	39	08:09 (LZ26)	18:51				17:00	21	07:47 (LZ35)	16:34				
3	05:32			05:59		06:44 (LZ25)	06:34		07:29 (LZ26)	07:08				06:47		07:25 (LZ35)	07:25				
	20:55			20:32	29	07:13 (LZ25)	19:44	40	08:09 (LZ26)	18:49				16:59	22	07:47 (LZ35)	16:33				
4	05:33			06:00		06:44 (LZ25)	06:35		07:28 (LZ26)	07:10				06:48		07:25 (LZ35)	07:26				
	20:55			20:31	29	07:13 (LZ25)	19:42	41	08:09 (LZ26)	18:47				16:58	23	07:48 (LZ35)	16:33				
5	05:33			06:02		06:43 (LZ25)	06:36		07:28 (LZ26)	07:11				06:50		07:25 (LZ35)	07:27				
	20:55			20:29	30	07:13 (LZ25)	19:40	41	08:09 (LZ26)	18:45				16:56	23	07:48 (LZ35)	16:33				
6	05:34			06:03		06:43 (LZ25)	06:38		07:28 (LZ26)	07:12				06:51		07:24 (LZ35)	07:28				
	20:55			20:28	30	07:13 (LZ25)	19:38	40	08:08 (LZ26)	18:44				16:55	23	07:47 (LZ35)	16:33				
7	05:34			06:04		06:43 (LZ25)	06:39		07:27 (LZ26)	07:13				06:52		07:25 (LZ35)	07:29				
	20:54			20:27	30	07:13 (LZ25)	19:37	41	08:08 (LZ26)	18:42				16:54	23	07:48 (LZ35)	16:32				
8	05:35			06:05		06:43 (LZ25)	06:40		07:27 (LZ26)	07:14				06:54		07:25 (LZ35)	07:30				
	20:54			20:25	30	07:13 (LZ25)	19:35	40	08:07 (LZ26)	18:40				16:53	22	07:47 (LZ35)	16:32				
9	05:36			06:06		06:43 (LZ25)	06:41		07:28 (LZ26)	07:16				06:55		07:26 (LZ35)	07:31				
	20:53			20:24	29	07:12 (LZ25)	19:33	39	08:07 (LZ26)	18:38				16:52	21	07:47 (LZ35)	16:32				
10	05:37			06:07		06:43 (LZ25)	06:42		07:28 (LZ26)	07:17				06:56		07:27 (LZ35)	07:32				
	20:53			20:23	29	07:12 (LZ25)	19:31	38	08:06 (LZ26)	18:37				16:50	20	07:47 (LZ35)	16:32				
11	05:37			06:08		06:43 (LZ25)	06:43		07:28 (LZ26)	07:18				06:58		07:27 (LZ35)	07:33				
	20:52			20:21	28	07:11 (LZ25)	19:29	37	08:05 (LZ26)	18:35				16:49	19	07:46 (LZ35)	16:32				
12	05:38			06:09		06:44 (LZ25)	06:44		07:29 (LZ26)	07:19				06:59		07:29 (LZ35)	07:34				
	20:52			20:20	26	07:10 (LZ25)	19:27	35	08:04 (LZ26)	18:33				16:48	16	07:45 (LZ35)	16:32				
13	05:39			06:10		06:44 (LZ25)	06:45		07:29 (LZ26)	07:20				07:00		07:30 (LZ35)	07:35				
	20:51			20:18	25	07:09 (LZ25)	19:26	34	08:03 (LZ26)	18:31				16:47	14	07:44 (LZ35)	16:32				
14	05:40			06:12		06:45 (LZ25)	06:47		07:30 (LZ26)	07:22				07:02		07:32 (LZ35)	07:35				
	20:51			20:17	23	07:08 (LZ25)	19:24	31	08:01 (LZ26)	18:30				16:46	11	07:43 (LZ35)	16:33				
15	05:41			06:13		06:47 (LZ25)	06:48		07:31 (LZ26)	07:23				07:03		07:34 (LZ35)	07:36				
	20:50			20:15	21	07:08 (LZ25)	19:22	28	07:59 (LZ26)	18:28				16:45	6	07:40 (LZ35)	16:33				
16	05:41			06:14		06:48 (LZ25)	06:49		07:32 (LZ26)	07:24				07:04			07:37				
	20:49			20:14	18	07:06 (LZ25)	19:20	25	07:57 (LZ26)	18:26				16:44			16:33				
17	05:42			06:15		06:50 (LZ25)	06:50		07:34 (LZ26)	07:25				07:05			07:38				
	20:49			20:12	14	07:04 (LZ25)	19:18	20	07:54 (LZ26)	18:25				16:43			16:33				
18	05:43			06:16		06:53 (LZ25)	06:51		07:37 (LZ26)	07:27				07:07			07:38				
	20:48			20:11	7	07:00 (LZ25)	19:16	13	07:50 (LZ26)	18:23				16:42			16:34				
19	05:44			06:17			06:52			07:28				07:08			07:39				
	20:47			20:09			19:15			18:21				16:41			16:34				
20	05:45			06:18			06:53			07:29				07:09			07:39				
	20:46			20:07			19:13			18:20				16:41			16:34				
21	05:46			06:20			06:55			07:30				07:11			07:40				
	20:46			20:06			19:11			18:18				16:40			16:35				
22	05:47			06:21			06:56			07:32				07:12			07:41				
	20:45			20:04			19:09			18:16				16:39			16:35				
23	05:48		06:55 (LZ25)	06:22		07:45 (LZ26)	06:57			07:33				07:13			07:41				
	20:44	7	07:02 (LZ25)	20:03	13	07:58 (LZ26)	19:07			18:15				16:38			16:36				
24	05:49		06:52 (LZ25)	06:23		07:42 (LZ26)	06:58			07:34				07:14			07:42				
	20:43	12	07:04 (LZ25)	20:01	19	08:01 (LZ26)	19:05			18:13				16:38			16:36				
25	05:50		06:51 (LZ25)	06:24		07:39 (LZ26)	06:59			06:35				07:16			07:42				
	20:42	15	07:06 (LZ25)	19:59	24	08:03 (LZ26)	19:04			17:12				16:37			16:37				
26	05:51		06:50 (LZ25)	06:25		07:37 (LZ26)	07:00			06:37				07:17			07:42				
	20:41	18	07:08 (LZ25)	19:58	27	08:04 (LZ26)	19:02			17:10				16:36			16:38				
27	05:52		06:49 (LZ25)	06:26		07:36 (LZ26)	07:01			06:38				07:18			07:43				
	20:40	20	07:09 (LZ25)	19:56	29	08:05 (LZ26)	19:00			17:09				16:36			16:38				
28	05:53		06:48 (LZ25)	06:27		07:35 (LZ26)	07:03			06:39			07:35 (LZ35)	07:19			07:43				
	20:39	22	07:10 (LZ25)	19:54	32	08:07 (LZ26)	18:58			17:07		2	07:37 (LZ35)	16:35			16:39				
29	05:54		06:47 (LZ25)	06:29		07:34 (LZ26)	07:04			06:41			07:30 (LZ35)	07:20			07:43				
	20:38	24	07:11 (LZ25)	19:52	34	08:08 (LZ26)	18:56			17:06		11	07:41 (LZ35)	16:35			16:40				
30	05:55		06:46 (LZ25)	06:30		07:33 (LZ26)	07:05			06:42			07:29 (LZ35)	07:22			07:43				
	20:37	25	07:11 (LZ25)	19:51	35	08:08 (LZ26)	18:54			17:04		15	07:44 (LZ35)	16:34			16:40				
31	05:56		06:45 (LZ25)	06:31		07:31 (LZ26)				06:43			07:27 (LZ35)				07:44				
	20:35	27	07:12 (LZ25)	19:49	38	08:09 (LZ26)				17:03		18	07:45 (LZ35)				16:41				
Potential sun hours		468		433			376			342				291			279				
Total, worst case		170		705			620			46				283							
Sun reduction		0.59		0.65			0.59			0.47				0.36							
Oper. time red.		1.00		1.00			1.00			1.00				1.00							
Wind dir. red.		0.57		0.58			0.61			0.66				0.66							
Total reduction		0.33		0.38			0.36			0.31				0.24							
Total, real		57		266			225			14				68							

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: SvO_01 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 84.6° Slope: 90.0° (60)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:43 16:42	07:27 17:19	06:48 17:57	06:53 19:35	06:03 20:11	05:31 20:44	19:34 (LZ60) 20:55	05:31 19:44 (LZ60)	05:57 20:34	06:32 19:47	07:06 18:52	06:44 17:01
2	07:43 16:43	07:26 17:20	06:46 17:58	06:51 19:36	06:02 20:12	05:30 20:44	19:34 (LZ60) 20:55	05:31 19:43 (LZ60)	05:58 20:32	06:33 19:45	07:07 18:50	06:45 17:00
3	07:43 16:44	07:25 17:22	06:44 17:59	06:49 19:37	06:00 20:13	05:30 20:45	19:35 (LZ60) 20:55	05:32 19:44 (LZ60)	05:59 20:31	06:34 19:43	07:08 18:48	06:47 16:59
4	07:43 16:45	07:24 17:23	06:43 18:00	06:47 19:39	05:59 20:14	05:29 20:46	19:35 (LZ60) 20:55	05:32 19:43 (LZ60)	06:00 20:30	06:35 19:41	07:09 18:47	06:48 16:57
5	07:43 16:46	07:23 17:24	06:41 18:02	06:46 19:40	05:57 20:15	05:29 20:47	19:36 (LZ60) 20:54	05:33 19:43 (LZ60)	06:01 20:29	06:36 19:40	07:10 18:45	06:49 16:56
6	07:43 16:47	07:22 17:26	06:39 18:03	06:44 19:41	05:56 20:17	05:29 20:47	19:37 (LZ60) 20:54	05:33 19:43 (LZ60)	06:02 20:27	06:37 19:38	07:11 18:43	06:51 16:55
7	07:43 16:48	07:20 17:27	06:38 18:04	06:42 19:42	05:55 20:18	05:28 20:48	19:37 (LZ60) 20:54	05:34 19:42 (LZ60)	06:03 20:26	06:38 19:36	07:13 18:41	06:52 16:54
8	07:43 16:49	07:19 17:29	06:36 18:06	06:40 19:43	05:53 20:19	05:28 20:49	19:38 (LZ60) 20:53	05:35 19:43 (LZ60)	06:05 20:25	06:39 19:34	07:14 18:40	06:53 16:52
9	07:43 16:50	07:18 17:30	06:34 18:07	06:39 19:45	05:52 20:20	05:28 20:49	19:38 (LZ60) 20:53	05:36 19:43 (LZ60)	06:06 20:23	06:41 19:32	07:15 18:38	06:54 16:51
10	07:43 16:51	07:16 17:31	06:32 18:08	06:37 19:46	05:51 20:21	05:27 20:50	19:39 (LZ60) 20:52	05:36 19:42 (LZ60)	06:07 20:22	06:42 19:31	07:16 18:36	06:56 16:50
11	07:42 16:52	07:15 17:33	06:31 18:09	06:35 19:47	05:50 20:22	05:27 20:51	19:40 (LZ60) 20:52	05:37 19:42 (LZ60)	06:08 20:21	06:43 19:29	07:17 18:34	06:57 16:49
12	07:42 16:53	07:14 17:34	06:29 18:11	06:33 19:48	05:48 20:24	05:27 20:51	19:40 (LZ60) 20:51	05:38 19:42 (LZ60)	06:09 20:19	06:44 19:27	07:19 18:33	06:58 16:48
13	07:42 16:54	07:12 17:35	06:27 18:12	06:32 19:49	05:47 20:25	19:38 (LZ60) 20:52	19:40 (LZ60) 20:51	05:39 19:43 (LZ60)	06:10 20:18	06:45 19:25	07:20 18:31	07:00 16:47
14	07:41 16:55	07:11 17:37	06:25 18:13	06:30 19:51	05:46 20:26	19:36 (LZ60) 20:52	19:41 (LZ60) 20:50	05:39 20:49	06:11 20:16	06:46 19:23	07:21 18:29	07:01 16:46
15	07:41 16:57	07:10 17:38	06:23 18:14	06:28 19:52	05:45 20:27	19:35 (LZ60) 20:53	19:41 (LZ60) 20:50	05:40 20:48	06:12 20:15	06:47 19:21	07:22 18:28	07:02 16:45
16	07:40 16:58	07:08 17:39	06:22 18:16	06:27 19:53	05:44 20:28	19:34 (LZ60) 20:53	19:42 (LZ60) 20:49	05:41 20:47	06:14 20:13	06:48 19:20	07:24 18:26	07:04 16:44
17	07:40 16:59	07:07 17:41	06:20 18:17	06:25 19:54	05:43 20:29	19:33 (LZ60) 20:53	19:42 (LZ60) 20:48	05:42 20:43	06:15 20:12	06:50 19:18	07:25 18:24	07:05 16:43
18	07:39 17:00	07:05 17:42	06:18 18:18	06:23 19:55	05:42 20:30	19:33 (LZ60) 20:54	19:43 (LZ60) 20:47	05:43 20:44	06:16 20:10	06:51 19:16	07:26 18:23	07:06 16:42
19	07:38 17:02	07:04 17:43	06:16 18:19	06:22 19:56	05:41 20:31	19:32 (LZ60) 20:54	19:44 (LZ60) 20:47	05:44 20:43	06:17 20:08	06:52 19:14	07:27 18:21	07:07 16:41
20	07:38 17:03	07:02 17:45	06:14 18:20	06:20 19:58	05:40 20:32	19:33 (LZ60) 20:54	19:44 (LZ60) 20:46	05:45 20:42	06:18 20:07	06:53 19:12	07:29 18:19	07:09 16:40
21	07:37 17:04	07:01 17:46	06:13 18:22	06:18 19:59	05:39 20:33	19:32 (LZ60) 20:55	19:44 (LZ60) 20:45	05:46 20:44	06:19 20:05	06:54 19:10	07:30 18:18	07:10 16:39
22	07:36 17:05	06:59 17:47	06:11 18:23	06:17 20:00	05:38 20:34	19:32 (LZ60) 20:55	19:44 (LZ60) 20:44	05:47 20:43	06:20 20:04	06:55 19:09	07:31 18:16	07:11 16:39
23	07:36 17:07	06:57 17:49	06:09 18:24	06:15 20:01	05:37 20:35	19:32 (LZ60) 20:55	19:44 (LZ60) 20:43	05:48 20:43	06:21 20:02	06:56 19:07	07:32 18:15	07:13 16:38
24	07:35 17:08	06:56 17:50	06:07 18:25	06:13 20:02	05:36 20:36	19:32 (LZ60) 20:55	19:45 (LZ60) 20:42	05:49 20:42	06:23 20:00	06:58 19:05	07:34 18:13	07:14 16:37
25	07:34 17:09	06:54 17:51	06:05 18:27	06:12 20:04	05:36 20:37	19:32 (LZ60) 20:55	19:45 (LZ60) 20:41	05:50 20:39	06:24 19:59	06:59 19:03	06:35 17:11	07:15 16:37
26	07:33 17:11	06:53 17:53	06:04 18:28	06:10 20:05	05:35 20:38	19:32 (LZ60) 20:55	19:44 (LZ60) 20:40	05:51 20:38	06:25 19:57	07:00 19:01	06:36 17:10	07:16 16:36
27	07:32 17:12	06:51 17:54	06:02 18:29	06:09 20:06	05:34 20:39	19:32 (LZ60) 20:55	19:45 (LZ60) 20:39	05:52 20:37	06:26 19:55	07:01 18:59	06:37 17:08	07:17 16:36
28	07:31 17:13	06:49 17:55	06:00 18:30	06:07 20:07	05:33 20:40	19:33 (LZ60) 20:55	19:44 (LZ60) 20:38	05:53 20:35	06:27 19:54	07:02 18:58	06:39 17:07	07:19 16:35
29	07:30 17:15		06:58 19:31	06:06 20:08	05:33 20:41	19:33 (LZ60) 20:55	19:45 (LZ60) 20:37	05:54 20:35	06:28 19:52	07:03 18:56	06:40 17:06	07:20 16:35
30	07:29 17:16		06:56 19:33	06:04 20:10	05:32 20:42	19:34 (LZ60) 20:55	19:44 (LZ60) 20:36	05:55 20:33	06:29 19:50	07:04 18:54	06:41 17:04	07:21 16:34
31	07:28 17:18		06:55 19:34	06:03 20:43	05:31 20:43	19:34 (LZ60) 20:55	19:44 (LZ60) 20:35	05:56 20:35	06:30 19:48	06:43 17:03	06:43 17:03	07:43 16:41
Potential sun hours	289	293	369	402	456	462	468	433	376	342	291	279
Total, worst case					394	399	604					
Sun reduction					0.47	0.49	0.59					
Oper. time red.					1.00	1.00	1.00					
Wind dir. red.					0.64	0.64	0.64					
Total reduction					0.30	0.31	0.37					
Total, real					117	125	226					

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: SvO_02 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 85.2° Slope: 90.0° (61)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:43 16:42	07:27 17:19	06:48 17:57	06:53 19:35	06:03 20:11	05:31 20:44	05:31 20:55	20:05 (LZ60) 19:47	05:57 20:34	06:32 19:47	07:06 18:52	06:44 17:01
2	07:43 16:43	07:26 17:20	06:46 17:58	06:51 19:36	06:02 20:12	05:30 20:44	05:31 20:55	20:05 (LZ60) 19:45	05:58 20:32	06:33 19:45	07:07 18:50	06:45 17:00
3	07:43 16:44	07:25 17:22	06:44 17:59	06:49 19:37	06:00 20:13	05:30 20:45	05:32 20:55	20:06 (LZ60) 20:31	05:59 20:31	06:34 19:43	07:08 18:48	06:47 16:59
4	07:43 16:45	07:24 17:23	06:43 18:00	06:47 19:39	05:59 20:14	05:29 20:46	05:32 20:55	20:06 (LZ60) 20:30	06:00 19:41	06:35 19:41	07:09 18:47	06:48 16:57
5	07:43 16:46	07:23 17:24	06:41 18:02	06:46 19:40	05:57 20:15	05:29 20:47	20:05 (LZ60) 20:54	20:07 (LZ60) 20:29	06:01 19:40	06:36 19:40	07:10 18:45	06:49 16:56
6	07:43 16:47	07:22 17:26	06:39 18:03	06:44 19:41	05:56 20:17	05:29 20:47	20:03 (LZ60) 20:54	20:09 (LZ60) 20:27	06:02 19:38	06:37 19:38	07:11 18:43	06:51 16:55
7	07:43 16:48	07:20 17:27	06:38 18:04	06:42 19:42	05:55 20:18	05:28 20:48	20:02 (LZ60) 20:54	06:03 20:26	06:38 19:36	06:38 19:36	07:13 18:41	06:52 16:54
8	07:43 16:49	07:19 17:29	06:36 18:06	06:40 19:43	05:53 20:19	05:28 20:49	20:01 (LZ60) 20:53	06:05 20:25	06:39 19:34	06:39 19:34	07:14 18:40	06:53 16:52
9	07:43 16:50	07:18 17:30	06:34 18:07	06:39 19:45	05:52 20:20	05:28 20:49	20:01 (LZ60) 20:53	06:06 20:23	06:41 19:32	06:41 19:32	07:15 18:38	06:54 16:51
10	07:42 16:51	07:16 17:31	06:32 18:08	06:37 19:46	05:51 20:21	05:27 20:50	20:01 (LZ60) 20:52	06:07 20:22	06:42 19:31	06:42 19:31	07:16 18:36	06:56 16:50
11	07:42 16:52	07:15 17:33	06:31 18:09	06:35 19:47	05:50 20:22	05:27 20:51	20:01 (LZ60) 20:52	06:08 20:21	06:43 19:29	06:43 19:29	07:17 18:34	06:57 16:49
12	07:42 16:53	07:14 17:34	06:29 18:11	06:33 19:48	05:48 20:24	05:27 20:51	20:00 (LZ60) 20:51	06:09 20:19	06:44 19:27	06:44 19:27	07:19 18:33	06:58 16:48
13	07:42 16:54	07:12 17:35	06:27 18:12	06:32 19:49	05:47 20:25	05:27 20:52	20:00 (LZ60) 20:51	06:10 20:18	06:45 19:25	06:45 19:25	07:20 18:31	07:00 16:47
14	07:41 16:56	07:11 17:37	06:25 18:13	06:30 19:51	05:46 20:26	05:27 20:52	20:00 (LZ60) 20:50	06:11 20:16	06:46 19:23	06:46 19:23	07:21 18:29	07:01 16:46
15	07:41 16:57	07:10 17:38	06:23 18:14	06:28 19:52	05:45 20:27	05:27 20:53	20:00 (LZ60) 20:50	06:12 20:15	06:47 19:21	06:47 19:21	07:22 18:28	07:02 16:45
16	07:40 16:58	07:08 17:39	06:22 18:16	06:27 19:53	05:44 20:28	05:27 20:53	20:00 (LZ60) 20:49	06:14 20:13	06:48 19:20	06:48 19:20	07:24 18:26	07:04 16:44
17	07:40 16:59	07:07 17:41	06:20 18:17	06:25 19:54	05:43 20:29	05:27 20:53	20:00 (LZ60) 20:48	06:15 20:12	06:50 19:18	06:50 19:18	07:25 18:24	07:05 16:43
18	07:39 17:00	07:05 17:42	06:18 18:18	06:23 19:55	05:42 20:30	05:27 20:54	20:00 (LZ60) 20:47	06:16 20:10	06:51 19:16	06:51 19:16	07:26 18:23	07:06 16:42
19	07:38 17:02	07:04 17:43	06:16 18:19	06:22 19:56	05:41 20:31	05:27 20:54	20:01 (LZ60) 20:47	06:17 20:08	06:52 19:14	06:52 19:14	07:27 18:21	07:07 16:41
20	07:38 17:03	07:02 17:45	06:14 18:20	06:20 19:58	05:40 20:32	05:27 20:54	20:01 (LZ60) 20:46	06:18 20:07	06:53 19:12	06:53 19:12	07:29 18:19	07:09 16:40
21	07:37 17:04	07:01 17:46	06:13 18:22	06:18 19:59	05:39 20:33	05:27 20:55	20:01 (LZ60) 20:45	06:19 20:05	06:54 19:10	06:54 19:10	07:30 18:18	07:10 16:39
22	07:36 17:05	06:59 17:47	06:11 18:23	06:17 20:00	05:38 20:34	05:27 20:55	20:01 (LZ60) 20:44	06:20 20:04	06:55 19:09	06:55 19:09	07:31 18:16	07:11 16:39
23	07:36 17:07	06:57 17:49	06:09 18:24	06:15 20:01	05:37 20:35	05:28 20:55	20:01 (LZ60) 20:43	06:21 20:02	06:56 19:07	06:56 19:07	07:32 18:15	07:13 16:38
24	07:35 17:08	06:56 17:50	06:07 18:25	06:13 20:02	05:36 20:36	05:28 20:55	20:02 (LZ60) 20:42	06:23 20:00	06:58 19:05	06:58 19:05	07:34 18:13	07:14 16:37
25	07:34 17:09	06:54 17:51	06:05 18:27	06:12 20:04	05:36 20:37	05:28 20:55	20:02 (LZ60) 20:41	06:24 19:59	06:59 19:03	06:59 19:03	07:35 17:11	07:15 16:37
26	07:33 17:11	06:53 17:53	06:04 18:28	06:10 20:05	05:35 20:38	05:28 20:55	20:02 (LZ60) 20:40	06:25 19:57	07:00 19:01	07:00 19:01	07:36 17:10	07:16 16:36
27	07:32 17:12	06:51 17:54	06:02 18:29	06:09 20:06	05:34 20:39	05:29 20:55	20:03 (LZ60) 20:39	06:26 19:55	07:01 18:59	07:01 18:59	07:37 17:08	07:17 16:36
28	07:31 17:13	06:49 17:55	06:00 18:30	06:07 20:07	05:33 20:40	05:29 20:55	20:03 (LZ60) 20:38	06:27 19:54	07:02 18:58	07:02 18:58	07:39 17:07	07:19 16:35
29	07:30 17:15		06:58 19:31	06:06 20:08	05:33 20:41	05:30 20:55	20:04 (LZ60) 20:37	06:28 19:52	07:03 18:56	07:03 18:56	07:40 17:06	07:20 16:35
30	07:29 17:16		06:56 19:33	06:04 20:10	05:32 20:42	05:30 20:55	20:04 (LZ60) 20:36	06:29 19:50	07:04 18:54	07:04 18:54	07:41 17:04	07:21 16:40
31	07:28 17:18		06:55 19:34		05:31 20:43		05:56 20:35	06:30 19:48			06:43 17:03	07:43 16:41
Potential sun hours	289	293	369	402	456	462	468	433	376	342	291	279
Total, worst case						375						
Sun reduction						0.49						
Oper. time red.						1.00						
Wind dir. red.						0.65						
Total reduction						0.32						
Total, real						121						

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		





SHADOW - Calendar

Calculation: Real Case Shadow receptor: SvO_03 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 86.6° Slope: 90.0° (62)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2.61 3.03 3.64 5.32 6.89 7.61 8.86 9.04 7.43 5.21 3.54 2.37

Operational time
N NNE ENE E SSE S SSW WSW W WNW NNW Sum
1,100 811 599 537 466 626 951 657 457 913 862 781 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:43 16:42	07:27 17:19	06:48 17:57	06:53 19:35	06:03 20:11	05:31 20:44	05:31 20:55	05:57 20:34	06:32 19:47	07:06 18:52	06:44 17:01	07:22 16:34
2	07:43 16:43	07:26 17:20	06:46 17:58	06:51 19:36	06:02 20:12	05:30 20:44	05:31 20:55	05:58 20:32	06:33 19:45	07:07 18:50	06:45 17:00	07:23 16:33
3	07:43 16:44	07:25 17:22	06:44 17:59	06:49 19:37	06:00 20:13	05:30 20:45	05:32 20:55	05:59 20:31	06:34 19:43	07:08 18:49	06:47 16:59	07:24 16:33
4	07:43 16:45	07:24 17:23	06:43 18:01	06:47 19:39	05:59 20:14	05:29 20:46	05:32 20:55	06:00 20:30	06:35 19:41	07:09 18:47	06:48 16:57	07:25 16:33
5	07:43 16:46	07:23 17:24	06:41 18:02	06:46 19:40	05:57 20:15	05:29 20:47	05:33 20:54	06:01 20:29	06:36 19:40	07:10 18:45	06:49 16:56	07:26 16:33
6	07:43 16:47	07:22 17:26	06:39 18:03	06:44 19:41	05:56 20:17	05:29 20:47	05:33 20:54	06:02 20:27	06:37 19:38	07:11 18:43	06:51 16:55	07:27 16:32
7	07:43 16:48	07:20 17:27	06:38 18:04	06:42 19:42	05:55 20:18	05:28 20:48	05:34 20:54	06:03 20:26	06:38 19:36	07:13 18:41	06:52 16:54	07:28 16:32
8	07:43 16:49	07:19 17:29	06:36 18:06	06:40 19:43	05:53 20:19	05:28 20:49	05:35 20:53	06:05 20:25	06:39 19:34	07:14 18:40	06:53 16:52	07:29 16:32
9	07:43 16:50	07:18 17:30	06:34 18:07	06:39 19:45	05:52 20:20	05:28 20:49	05:36 20:53	06:06 20:23	06:41 19:32	07:15 18:38	06:54 16:51	07:30 16:32
10	07:43 16:51	07:16 17:31	06:32 18:08	06:37 19:46	05:51 20:21	05:27 20:50	05:36 20:52	06:07 20:22	06:42 19:31	07:16 18:36	06:56 16:50	07:31 16:32
11	07:42 16:52	07:15 17:33	06:31 18:09	06:35 19:47	05:50 20:22	05:27 20:51	05:37 20:52	06:08 20:21	06:43 19:29	07:17 18:34	06:57 16:49	07:32 16:32
12	07:42 16:53	07:14 17:34	06:29 18:11	06:33 19:48	05:48 20:24	05:27 20:51	05:38 20:51	06:09 20:19	06:44 19:27	07:19 18:33	06:58 16:48	07:33 16:32
13	07:42 16:54	07:12 17:35	06:27 18:12	06:32 19:49	05:47 20:25	05:27 20:52	05:39 20:51	06:10 20:18	06:45 19:25	07:20 18:31	07:00 16:47	07:34 16:32
14	07:41 16:56	07:11 17:37	06:25 18:13	06:30 19:51	05:46 20:26	05:27 20:52	05:39 20:50	06:11 20:16	06:46 19:23	07:21 18:29	07:01 16:46	07:35 16:32
15	07:41 16:57	07:10 17:38	06:23 18:14	06:28 19:52	05:45 20:27	05:27 20:53	05:40 20:50	06:12 20:15	06:47 19:21	07:22 18:28	07:02 16:45	07:35 16:32
16	07:40 16:58	07:08 17:39	06:22 18:16	06:27 19:53	05:44 20:28	05:27 20:53	05:41 20:49	06:14 20:13	06:48 19:20	07:24 18:26	07:04 16:44	07:36 16:33
17	07:40 16:59	07:07 17:41	06:20 18:17	06:25 19:54	05:43 20:29	05:27 20:53	05:42 20:48	06:15 20:12	06:50 19:18	07:25 18:24	07:05 16:43	07:37 16:33
18	07:39 17:00	07:05 17:42	06:18 18:18	06:23 19:55	05:42 20:30	05:27 20:54	05:43 20:47	06:16 20:10	06:51 19:16	07:26 18:23	07:06 16:42	07:38 16:33
19	07:38 17:02	07:04 17:43	06:16 18:19	06:22 19:57	05:41 20:31	05:27 20:54	05:44 20:47	06:17 20:08	06:52 19:14	07:27 18:21	07:07 16:41	07:38 16:34
20	07:38 17:03	07:02 17:45	06:14 18:20	06:20 19:58	05:40 20:32	05:27 20:54	05:45 20:46	06:18 20:07	06:53 19:12	07:29 18:19	07:09 16:40	07:39 16:34
21	07:37 17:04	07:01 17:46	06:13 18:22	06:18 19:59	05:39 20:33	05:27 20:55	05:46 20:45	06:19 20:05	06:54 19:10	07:30 18:18	07:10 16:39	07:39 16:34
22	07:36 17:06	06:59 17:47	06:11 18:23	06:17 20:00	05:38 20:34	05:27 20:55	05:47 20:44	06:20 20:04	06:55 19:09	07:31 18:16	07:11 16:39	07:40 16:35
23	07:36 17:07	06:57 17:49	06:09 18:24	06:15 20:01	05:37 20:35	05:28 20:55	05:48 20:43	06:21 20:02	06:56 19:07	07:32 18:15	07:13 16:38	07:40 16:35
24	07:35 17:08	06:56 17:50	06:07 18:25	06:14 20:02	05:36 20:36	05:28 20:55	05:49 20:42	06:23 20:00	06:58 19:05	07:34 18:13	07:14 16:37	07:41 16:36
25	07:34 17:09	06:54 17:51	06:05 18:27	06:12 20:04	05:36 20:37	05:28 20:55	05:50 20:41	06:24 19:59	06:59 19:03	06:35 17:11	07:15 16:37	07:41 16:37
26	07:33 17:11	06:53 17:53	06:04 18:28	06:10 20:05	05:35 20:38	05:28 20:55	05:51 20:40	06:25 19:57	07:00 19:01	06:36 17:10	07:16 16:36	07:42 16:37
27	07:32 17:12	06:51 17:54	06:02 18:29	06:09 20:06	05:34 20:39	05:29 20:55	05:52 20:39	06:26 19:55	07:01 18:59	06:37 17:08	07:17 16:36	07:42 16:38
28	07:31 17:13	06:49 17:55	06:00 18:30	06:07 20:07	05:33 20:40	05:29 20:55	05:53 20:38	06:27 19:54	07:02 18:58	06:39 17:07	07:19 16:35	07:42 16:39
29	07:30 17:15		06:58 19:31	06:06 20:08	05:33 20:41	05:30 20:55	05:54 20:37	06:28 19:52	07:03 18:56	06:40 17:06	07:20 16:35	07:43 16:39
30	07:29 17:16		06:56 19:33	06:04 20:10	05:32 20:42	05:30 20:55	05:55 20:36	06:29 19:50	07:04 18:54	06:41 17:04	07:21 16:34	07:43 16:40
31	07:28 17:18		06:55 19:34		05:31 20:43		05:56 20:35	06:30 19:48		06:43 17:03		07:43 16:41
Potential sun hours	289	293	369	402	456	462	468	433	376	342	291	279
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: SvO_04 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 82.7° Slope: 90.0° (63)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:43 16:42	07:27 17:19	06:48 17:57	06:53 19:35	06:03 20:11	05:31 20:44	05:31 20:55	05:57 20:34	06:32 19:47	07:06 18:52	06:44 17:01	07:22 16:34
2	07:43 16:43	07:26 17:20	06:46 17:58	06:51 19:36	06:02 20:12	05:30 20:44	05:31 20:55	05:58 20:32	06:33 19:45	07:07 18:50	06:45 17:00	07:23 16:33
3	07:43 16:44	07:25 17:22	06:44 17:59	06:49 19:37	06:00 20:13	05:30 20:45	05:32 20:55	05:59 20:31	06:34 19:43	07:08 18:49	06:47 16:59	07:24 16:33
4	07:43 16:45	07:24 17:23	06:43 18:01	06:47 19:39	05:59 20:14	05:29 20:46	05:32 20:54	06:00 20:30	06:35 19:41	07:09 18:47	06:48 16:57	07:25 16:33
5	07:43 16:46	07:23 17:24	06:41 18:02	06:46 19:40	05:57 20:15	05:29 20:47	05:33 20:54	06:01 20:29	06:36 19:40	07:10 18:45	06:49 16:56	07:26 16:33
6	07:43 16:47	07:22 17:26	06:39 18:03	06:44 19:41	05:56 20:17	05:29 20:47	05:34 20:54	06:02 20:27	06:37 19:38	07:11 18:43	06:50 16:55	07:27 16:32
7	07:43 16:48	07:20 17:27	06:38 18:04	06:42 19:42	05:55 20:18	05:28 20:48	05:34 20:54	06:03 20:26	06:38 19:36	07:13 18:41	06:52 16:54	07:28 16:32
8	07:43 16:49	07:19 17:29	06:36 18:06	06:40 19:43	05:53 20:19	05:28 20:49	05:35 20:53	06:05 20:25	06:39 19:34	07:14 18:40	06:53 16:52	07:29 16:32
9	07:43 16:50	07:18 17:30	06:34 18:07	06:39 19:45	05:52 20:20	05:28 20:49	05:36 20:53	06:06 20:23	06:41 19:32	07:15 18:38	06:54 16:51	07:30 16:32
10	07:42 16:51	07:16 17:31	06:32 18:08	06:37 19:46	05:51 20:21	05:27 20:50	05:36 20:52	06:07 20:22	06:42 19:31	07:16 18:36	06:56 16:50	07:31 16:32
11	07:42 16:52	07:15 17:33	06:31 18:09	06:35 19:47	05:50 20:22	05:27 20:51	05:37 20:52	06:08 20:21	06:43 19:29	07:17 18:34	06:57 16:49	07:32 16:32
12	07:42 16:53	07:14 17:34	06:29 18:11	06:33 19:48	05:48 20:24	05:27 20:51	05:38 20:51	06:09 20:19	06:44 19:27	07:19 18:33	06:58 16:48	07:33 16:32
13	07:41 16:54	07:12 17:35	06:27 18:12	06:32 19:49	05:47 20:25	05:27 20:52	05:39 20:51	06:10 20:18	06:45 19:25	07:20 18:31	07:00 16:47	07:34 16:32
14	07:41 16:56	07:11 17:37	06:25 18:13	06:30 19:51	05:46 20:26	05:27 20:52	05:39 20:50	06:11 20:16	06:46 19:23	07:21 18:29	07:01 16:46	07:35 16:32
15	07:41 16:57	07:10 17:38	06:23 18:14	06:28 19:52	05:45 20:27	05:27 20:53	05:40 20:50	06:12 20:15	06:47 19:21	07:22 18:28	07:02 16:45	07:35 16:32
16	07:40 16:58	07:08 17:39	06:22 18:16	06:27 19:53	05:44 20:28	05:27 20:53	05:41 20:49	06:14 20:13	06:48 19:20	07:24 18:26	07:04 16:44	07:36 16:33
17	07:40 16:59	07:07 17:41	06:20 18:17	06:25 19:54	05:43 20:29	05:27 20:53	05:42 20:48	06:15 20:12	06:50 19:18	07:25 18:24	07:05 16:43	07:37 16:33
18	07:39 17:00	07:05 17:42	06:18 18:18	06:23 19:55	05:42 20:30	05:27 20:54	05:43 20:47	06:16 20:10	06:51 19:16	07:26 18:23	07:06 16:42	07:38 16:33
19	07:38 17:02	07:04 17:43	06:16 18:19	06:22 19:56	05:41 20:31	05:27 20:54	05:44 20:47	06:17 20:08	06:52 19:14	07:27 18:21	07:07 16:41	07:38 16:34
20	07:38 17:03	07:02 17:45	06:14 18:20	06:20 19:58	05:40 20:32	05:27 20:54	05:45 20:46	06:18 20:07	06:53 19:12	07:29 18:19	07:09 16:40	07:39 16:34
21	07:37 17:04	07:01 17:46	06:13 18:22	06:18 19:59	05:39 20:33	05:27 20:55	05:46 20:45	06:19 20:05	06:54 19:10	07:30 18:18	07:10 16:39	07:39 16:34
22	07:36 17:06	06:59 17:47	06:11 18:23	06:17 20:00	05:38 20:34	05:27 20:55	05:47 20:44	06:20 20:04	06:55 19:09	07:31 18:16	07:11 16:39	07:40 16:35
23	07:36 17:07	06:57 17:49	06:09 18:24	06:15 20:01	05:37 20:35	05:28 20:55	05:48 20:43	06:21 20:02	06:56 19:07	07:32 18:15	07:13 16:38	07:40 16:35
24	07:35 17:08	06:56 17:50	06:07 18:25	06:14 20:02	05:36 20:36	05:28 20:55	05:49 20:42	06:23 20:00	06:58 19:05	07:34 18:13	07:14 16:37	07:41 16:36
25	07:34 17:09	06:54 17:51	06:05 18:27	06:12 20:04	05:36 20:37	05:28 20:55	05:50 20:41	06:24 19:59	06:59 19:03	06:35 17:11	07:15 16:37	07:41 16:37
26	07:33 17:11	06:53 17:53	06:04 18:28	06:10 20:05	05:35 20:38	05:28 20:55	05:51 20:40	06:25 19:57	07:00 19:01	06:36 17:10	07:16 16:36	07:42 16:37
27	07:32 17:12	06:51 17:54	06:02 18:29	06:09 20:06	05:34 20:39	05:29 20:55	05:52 20:39	06:26 19:55	07:01 18:59	06:37 17:08	07:17 16:36	07:42 16:38
28	07:31 17:13	06:49 17:55	06:00 18:30	06:07 20:07	05:33 20:40	05:29 20:55	05:53 20:38	06:27 19:54	07:02 18:58	06:39 17:07	07:19 16:35	07:42 16:39
29	07:30 17:15		06:58 19:31	06:06 20:08	05:33 20:41	05:30 20:55	05:54 20:37	06:28 19:52	07:03 18:56	06:40 17:06	07:20 16:35	07:43 16:39
30	07:29 17:16		06:56 19:33	06:04 20:10	05:32 20:42	05:30 20:55	05:55 20:36	06:29 19:50	07:04 18:54	06:41 17:04	07:21 16:34	07:43 16:40
31	07:28 17:18		06:55 19:34		05:31 20:43		05:56 20:35	06:30 19:48		06:43 17:03		07:43 16:41
Potential sun hours	289	293	369	402	456	462	468	433	376	342	291	279
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZaG_01 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -94.9° Slope: 90.0° (51)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

January			February			March			April			May			June		
1	07:43		08:28 (LZ56)	07:27		06:48			07:36 (LZ45)	06:53		07:22 (LZ40)	06:03		06:33 (LZ32)	05:31	
	16:42	24	08:52 (LZ56)	17:19		17:57	30	08:06 (LZ45)	19:35		28	07:50 (LZ40)	20:11	23	06:56 (LZ32)	20:44	
2	07:44		08:28 (LZ56)	07:26		06:46			07:36 (LZ45)	06:51		07:21 (LZ40)	06:02		06:33 (LZ32)	05:30	
	16:43	23	08:51 (LZ56)	17:20		17:58	29	08:05 (LZ45)	19:36	29	07:50 (LZ40)	20:12	23	06:56 (LZ32)	20:45		
3	07:44		08:29 (LZ56)	07:25		06:45			07:37 (LZ45)	06:49		07:20 (LZ40)	06:00		06:33 (LZ32)	05:30	
	16:44	22	08:51 (LZ56)	17:22		17:59	26	08:03 (LZ45)	19:37	29	07:49 (LZ40)	20:13	22	06:55 (LZ32)	20:45		
4	07:44		08:30 (LZ56)	07:24		06:43			07:39 (LZ45)	06:47		07:21 (LZ40)	05:59		06:34 (LZ32)	05:29	
	16:45	22	08:52 (LZ56)	17:23		18:01	23	08:02 (LZ45)	19:39	29	07:50 (LZ40)	20:15	21	06:55 (LZ32)	20:46		
5	07:44		08:30 (LZ56)	07:23		06:41			07:40 (LZ45)	06:46		07:20 (LZ40)	05:57		06:34 (LZ32)	05:29	
	16:46	22	08:52 (LZ56)	17:24		18:02	20	08:00 (LZ45)	19:40	29	07:49 (LZ40)	20:16	21	06:55 (LZ32)	20:47		
6	07:43		08:31 (LZ56)	07:22		06:39			07:43 (LZ45)	06:44		07:20 (LZ40)	05:56		06:35 (LZ32)	05:29	
	16:47	21	08:52 (LZ56)	17:26		18:03	13	07:56 (LZ45)	19:41	29	07:49 (LZ40)	20:17	19	06:54 (LZ32)	20:48		
7	07:43		08:32 (LZ56)	07:20		06:38				06:42		07:20 (LZ40)	05:55		06:36 (LZ32)	05:28	
	16:48	20	08:52 (LZ56)	17:27		18:04			19:42	28	07:48 (LZ40)	20:18	16	06:52 (LZ32)	20:48		
8	07:43		08:34 (LZ56)	07:19		06:36				06:40		07:20 (LZ40)	05:53		06:37 (LZ32)	05:28	
	16:49	19	08:53 (LZ56)	17:29		18:06			19:43	28	07:48 (LZ40)	20:19	14	06:51 (LZ32)	20:49		
9	07:43		08:34 (LZ56)	07:18		06:34				06:39		07:21 (LZ40)	05:52		06:39 (LZ32)	05:28	
	16:50	18	08:52 (LZ56)	17:30		18:07			19:45	25	07:46 (LZ40)	20:20	10	06:49 (LZ32)	20:50		
10	07:43		08:35 (LZ56)	07:17		06:32				06:37		07:21 (LZ40)	05:51			05:27	
	16:51	17	08:52 (LZ56)	17:31		18:08			19:46	24	07:45 (LZ40)	20:21				05:27	
11	07:42		08:36 (LZ56)	07:15		06:31				06:35		07:21 (LZ40)	05:50			05:27	
	16:52	15	08:51 (LZ56)	17:33	5	07:55 (LZ45)	18:09		19:47	22	07:43 (LZ40)	20:23				05:27	
12	07:42		08:38 (LZ56)	07:14		06:29				06:33		07:23 (LZ40)	05:49			05:27	
	16:53	12	08:50 (LZ56)	17:34	14	07:59 (LZ45)	18:11		19:48	19	07:42 (LZ40)	20:24				05:27	
13	07:42		08:40 (LZ56)	07:13		06:27				06:32		07:25 (LZ40)	05:47			05:27	
	16:54	10	08:50 (LZ56)	17:35	19	08:02 (LZ45)	18:12		19:49	14	07:39 (LZ40)	20:25				05:27	
14	07:41		08:42 (LZ56)	07:11		06:25				06:30		07:28 (LZ40)	05:46			05:27	
	16:56	5	08:47 (LZ56)	17:37	23	08:04 (LZ45)	18:13		19:51	7	07:35 (LZ40)	20:26				05:27	
15	07:41			07:10		06:24				06:28			05:45			05:27	
	16:57			17:38	26	08:05 (LZ45)	18:14		19:52			20:27				05:27	
16	07:40			07:08		06:22				06:27			05:44			05:27	
	16:58			17:39	29	08:07 (LZ45)	18:16		19:53			20:28				05:27	
17	07:40			07:07		06:20				06:25			05:43			05:27	
	16:59			17:41	30	08:07 (LZ45)	18:17		19:54			20:29				05:27	
18	07:39			07:05		06:18				06:23			05:42			05:27	
	17:00			17:42	32	08:09 (LZ45)	18:18		19:55			20:30				05:27	
19	07:39			07:04		06:16				06:22			05:41			05:27	
	17:02			17:44	33	08:09 (LZ45)	18:19		19:57			20:31				05:27	
20	07:38			07:02		06:15				06:20			05:40			05:27	
	17:03			17:45	34	08:09 (LZ45)	18:21		19:58			20:32				05:27	
21	07:37			07:01		06:13				06:18			05:39			05:27	
	17:04			17:46	35	08:10 (LZ45)	18:22		19:59			20:33				05:27	
22	07:37			06:59		06:11				06:17		06:41 (LZ32)	05:38			05:27	
	17:06			17:48	35	08:09 (LZ45)	18:23		20:00	10	06:51 (LZ32)	20:34				05:27	
23	07:36			06:58		06:09				06:15		06:39 (LZ32)	05:37			05:28	
	17:07			17:49	36	08:10 (LZ45)	18:24		20:01	14	06:53 (LZ32)	20:35				05:28	
24	07:35			06:56		06:07				06:14		06:37 (LZ32)	05:36			05:28	
	17:08			17:50	35	08:09 (LZ45)	18:25		20:03	17	06:54 (LZ32)	20:36				05:28	
25	07:34			06:54		06:05				06:12		06:36 (LZ32)	05:36			05:28	
	17:09			17:52	35	08:09 (LZ45)	18:27		20:04	20	06:56 (LZ32)	20:37				05:28	
26	07:33			06:53		06:04				06:10		06:35 (LZ32)	05:35			05:28	
	17:11			17:53	35	08:09 (LZ45)	18:28		20:05	21	06:56 (LZ32)	20:38				05:28	
27	07:32			06:51		06:02				06:09		06:35 (LZ32)	05:34			05:29	
	17:12			17:54	34	08:08 (LZ45)	18:29	13	06:44 (LZ40)	20:06	22	06:57 (LZ32)	20:39			05:29	
28	07:31			06:50		06:00				06:07		06:33 (LZ32)	05:33			05:29	
	17:13			17:55	33	08:07 (LZ45)	18:30	18	06:46 (LZ40)	20:07	23	06:56 (LZ32)	20:40			05:30	
29	07:31					06:58				07:26 (LZ40)	06:06		06:34 (LZ32)	05:33		05:30	
	17:15					19:31	21	07:47 (LZ40)	20:09	23	06:57 (LZ32)	20:41				05:30	
30	07:30					06:56				07:25 (LZ40)	06:04		06:34 (LZ32)	05:32		05:30	
	17:16					19:33	24	07:49 (LZ40)	20:10	23	06:57 (LZ32)	20:42				05:30	
31	07:29					06:55				07:24 (LZ40)			05:31			05:30	
	17:18					19:34	25	07:49 (LZ40)				20:43				05:30	
Potential sun hours	289			293		369			402			456			462		
Total, worst case	250			523		242			513			169					
Sun reduction	0.28			0.29		0.31			0.40			0.47					
Oper. time red.	1.00			1.00		1.00			1.00			1.00					
Wind dir. red.	0.66			0.64		0.63			0.59			0.57					
Total reduction	0.19			0.19		0.19			0.24			0.27					
Total, real	46			97		46			121			45					

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZaG_01 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -94.9° Slope: 90.0° (51)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:55	05:57 20:34	06:32 19:47	07:21 (LZ40) 18:52	06:44 17:01	07:22 16:34 15 08:18 (LZ56)
2	05:31 20:55	05:58 20:33	06:33 19:45	07:20 (LZ40) 18:50	06:45 17:00	07:23 16:33 17 08:18 (LZ56)
3	05:32 20:55	05:59 20:31	06:34 19:43	07:19 (LZ40) 18:49	06:47 16:59	07:24 16:33 18 08:18 (LZ56)
4	05:32 20:55	06:00 20:30	06:48 (LZ32) 19:42	07:17 (LZ40) 18:47	07:09 16:57	07:26 16:33 19 08:18 (LZ56)
5	05:33 20:54	06:01 20:29	06:47 (LZ32) 19:40	07:17 (LZ40) 18:45	07:10 16:56	07:27 16:33 20 08:17 (LZ56)
6	05:33 20:54	06:02 20:28	06:46 (LZ32) 19:38	07:16 (LZ40) 18:43	07:12 16:55	07:28 16:32 21 08:17 (LZ56)
7	05:34 20:54	06:03 20:26	06:45 (LZ32) 19:36	07:15 (LZ40) 18:41	06:52 16:54	07:29 16:32 22 08:17 (LZ56)
8	05:35 20:53	06:05 20:25	06:44 (LZ32) 19:34	07:15 (LZ40) 18:40	06:53 16:52	07:30 16:32 22 08:18 (LZ56)
9	05:36 20:53	06:06 20:24	06:43 (LZ32) 19:33	07:15 (LZ40) 18:38	06:55 16:51	07:31 16:32 22 08:18 (LZ56)
10	05:36 20:53	06:07 20:22	06:42 (LZ32) 19:31	07:14 (LZ40) 18:36	06:56 16:50	07:32 16:32 23 08:18 (LZ56)
11	05:37 20:52	06:08 20:21	06:42 (LZ32) 19:29	07:14 (LZ40) 18:34	06:57 16:49	07:32 16:32 24 08:18 (LZ56)
12	05:38 20:52	06:09 20:19	06:42 (LZ32) 19:27	07:15 (LZ40) 18:33	06:59 16:48	07:33 16:32 23 08:19 (LZ56)
13	05:39 20:51	06:10 20:18	06:41 (LZ32) 19:25	07:16 (LZ40) 18:31	07:00 16:47	07:34 16:32 24 08:18 (LZ56)
14	05:39 20:50	06:11 20:16	06:41 (LZ32) 19:23	07:17 (LZ40) 18:29	07:01 16:46	07:35 16:32 24 08:19 (LZ56)
15	05:40 20:50	06:12 20:15	06:41 (LZ32) 19:22	07:18 (LZ40) 18:28	07:03 16:45	07:36 16:32 24 08:20 (LZ56)
16	05:41 20:49	06:14 20:13	06:41 (LZ32) 19:20	07:20 (LZ40) 18:26	07:04 16:44	07:36 16:33 25 08:20 (LZ56)
17	05:42 20:48	06:15 20:12	06:42 (LZ32) 19:18	07:24 (LZ40) 18:24	07:05 16:43	07:37 16:33 24 08:20 (LZ56)
18	05:43 20:48	06:16 20:10	06:42 (LZ32) 19:16	07:26 (LZ40) 18:23	07:06 16:42	07:38 16:33 24 08:21 (LZ56)
19	05:44 20:47	06:17 20:09	06:44 (LZ32) 19:14	07:27 (LZ40) 18:21	07:08 16:41	07:38 16:34 24 08:22 (LZ56)
20	05:45 20:46	06:18 20:07	06:45 (LZ32) 19:12	07:29 (LZ40) 18:19	07:09 16:40	07:39 16:34 25 08:21 (LZ56)
21	05:46 20:45	06:19 20:05	06:48 (LZ32) 19:11	07:30 (LZ40) 18:18	07:10 16:40	07:40 16:34 25 08:22 (LZ56)
22	05:47 20:44	06:20 20:04	06:55 19:09	07:31 (LZ40) 18:16	07:11 16:39	07:40 16:35 25 08:22 (LZ56)
23	05:48 20:43	06:21 20:02	06:56 19:07	07:32 (LZ40) 18:15	07:13 16:38	07:41 16:35 25 08:23 (LZ56)
24	05:49 20:42	06:23 20:01	06:58 19:05	07:34 (LZ40) 18:13	07:14 16:37	07:41 16:36 24 08:24 (LZ56)
25	05:50 20:41	06:24 19:59	06:59 19:03	07:35 (LZ40) 17:12	07:15 16:37	07:42 16:37 24 08:24 (LZ56)
26	05:51 20:40	06:25 19:57	07:00 19:01	07:36 (LZ40) 17:10	07:16 16:36	07:42 16:37 24 08:25 (LZ56)
27	05:52 20:39	06:26 19:55	07:01 19:00	07:37 (LZ40) 17:09	07:18 16:36	07:42 16:38 25 08:25 (LZ56)
28	05:53 20:38	06:27 19:54	07:02 18:58	07:39 (LZ40) 17:07	07:19 16:35	07:43 16:39 25 08:25 (LZ56)
29	05:54 20:37	06:28 19:52	07:03 18:56	07:40 (LZ40) 17:06	07:20 16:35	07:43 16:40 24 08:26 (LZ56)
30	05:55 20:36	06:29 19:50	07:05 18:54	07:41 (LZ40) 17:04	07:21 16:34	07:43 16:40 24 08:26 (LZ56)
31	05:56 20:35	06:31 19:49	07:22 (LZ40) 19:41	06:43 17:03	07:22 16:41	07:43 16:41 23 08:27 (LZ56)
Potential sun hours	468	433	376	342	291	279
Total, worst case		391	411	672	26	708
Sun reduction		0.65	0.59	0.47	0.36	0.26
Oper. time red.		1.00	1.00	1.00	1.00	1.00
Wind dir. red.		0.57	0.61	0.64	0.66	0.66
Total reduction		0.37	0.36	0.30	0.24	0.18
Total, real		144	148	203	6	124

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		





SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZaG_02 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -83.7° Slope: 90.0° (52)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

January			February			March			April			May			June		
1	07:43		08:14 (LZ56)	07:27	06:48				06:53			06:03			05:31		
	16:42	14	08:28 (LZ56)	17:19	17:57				19:35			20:11			20:44		
2	07:44		08:14 (LZ56)	07:26	06:46			07:21 (LZ45)	06:51			06:02			05:30		
	16:43	15	08:29 (LZ56)	17:20	17:58		7	07:28 (LZ45)	19:36			20:12			20:45		
3	07:44		08:14 (LZ56)	07:25	06:45			07:16 (LZ45)	06:49			06:00			05:30		
	16:44	17	08:31 (LZ56)	17:22	17:59		16	07:32 (LZ45)	19:37			20:13			20:45		
4	07:44		08:14 (LZ56)	07:24	06:43			07:14 (LZ45)	06:47			05:59		06:25 (LZ32)	05:29		
	16:45	18	08:32 (LZ56)	17:23	18:01		21	07:35 (LZ45)	19:39			20:14	6	06:31 (LZ32)	20:46		
5	07:44		08:14 (LZ56)	07:23	06:41			07:12 (LZ45)	06:46			05:57		06:23 (LZ32)	05:29		
	16:46	19	08:33 (LZ56)	17:24	18:02		24	07:36 (LZ45)	19:40			20:16	11	06:34 (LZ32)	20:47		
6	07:43		08:14 (LZ56)	07:22	06:39			07:10 (LZ45)	06:44			05:56		06:21 (LZ32)	05:29		
	16:47	20	08:34 (LZ56)	17:26	18:03		27	07:37 (LZ45)	19:41			20:17	15	06:36 (LZ32)	20:48		
7	07:43		08:14 (LZ56)	07:20	06:38			07:08 (LZ45)	06:42			05:55		06:19 (LZ32)	05:28		
	16:48	21	08:35 (LZ56)	17:27	18:04		30	07:38 (LZ45)	19:42			20:18	17	06:36 (LZ32)	20:48		
8	07:43		08:15 (LZ56)	07:19	06:36			07:07 (LZ45)	06:40			05:53		06:18 (LZ32)	05:28		
	16:49	21	08:36 (LZ56)	17:29	18:06		31	07:38 (LZ45)	19:43			20:19	19	06:37 (LZ32)	20:49		
9	07:43		08:14 (LZ56)	07:18	06:34			07:06 (LZ45)	06:39			05:52		06:18 (LZ32)	05:28		
	16:50	22	08:36 (LZ56)	17:30	18:07		34	07:40 (LZ45)	19:45			20:20	20	06:38 (LZ32)	20:50		
10	07:43		08:14 (LZ56)	07:17	06:32			07:05 (LZ45)	06:37			05:51		06:17 (LZ32)	05:27		
	16:51	23	08:37 (LZ56)	17:31	18:08		35	07:40 (LZ45)	19:46	7	07:15 (LZ40)	20:21	22	06:39 (LZ32)	20:50		
11	07:42		08:14 (LZ56)	07:15	06:31			07:04 (LZ45)	06:35			05:50		06:17 (LZ32)	05:27		
	16:52	23	08:37 (LZ56)	17:33	18:09		36	07:40 (LZ45)	19:47	14	07:18 (LZ40)	20:23	22	06:39 (LZ32)	20:51		
12	07:42		08:14 (LZ56)	07:14	06:29			07:04 (LZ45)	06:33			07:02 (LZ40)	05:49	06:17 (LZ32)	05:27		
	16:53	24	08:38 (LZ56)	17:34	18:11		35	07:39 (LZ45)	19:48	19	07:21 (LZ40)	20:24	22	06:39 (LZ32)	20:51		
13	07:42		08:15 (LZ56)	07:13	06:27			07:04 (LZ45)	06:32			07:00 (LZ40)	05:47	06:16 (LZ32)	05:27		
	16:54	25	08:40 (LZ56)	17:35	18:12		36	07:40 (LZ45)	19:49	22	07:22 (LZ40)	20:25	23	06:39 (LZ32)	20:52		
14	07:41		08:14 (LZ56)	07:11	06:25			07:04 (LZ45)	06:30			06:58 (LZ40)	05:46	06:16 (LZ32)	05:27		
	16:56	26	08:40 (LZ56)	17:37	18:13		36	07:40 (LZ45)	19:51	24	07:22 (LZ40)	20:26	23	06:39 (LZ32)	20:52		
15	07:41		08:14 (LZ56)	07:10	06:24			07:03 (LZ45)	06:28			06:58 (LZ40)	05:45	06:16 (LZ32)	05:27		
	16:57	26	08:40 (LZ56)	17:38	18:14		36	07:39 (LZ45)	19:52	26	07:24 (LZ40)	20:27	23	06:39 (LZ32)	20:53		
16	07:40		08:15 (LZ56)	07:08	06:22			07:03 (LZ45)	06:27			06:57 (LZ40)	05:44	06:16 (LZ32)	05:27		
	16:58	26	08:41 (LZ56)	17:40	18:16		35	07:38 (LZ45)	19:53	27	07:24 (LZ40)	20:28	23	06:39 (LZ32)	20:53		
17	07:40		08:15 (LZ56)	07:07	06:20			07:03 (LZ45)	06:25			06:56 (LZ40)	05:43	06:16 (LZ32)	05:27		
	16:59	26	08:41 (LZ56)	17:41	18:17		34	07:37 (LZ45)	19:54	27	07:23 (LZ40)	20:29	22	06:38 (LZ32)	20:54		
18	07:39		08:16 (LZ56)	07:05	06:18			07:03 (LZ45)	06:23			06:56 (LZ40)	05:42	06:17 (LZ32)	05:27		
	17:00	26	08:42 (LZ56)	17:42	18:18		33	07:36 (LZ45)	19:55	28	07:24 (LZ40)	20:30	21	06:38 (LZ32)	20:54		
19	07:39		08:16 (LZ56)	07:04	06:16			07:05 (LZ45)	06:22			06:55 (LZ40)	05:41	06:18 (LZ32)	05:27		
	17:02	26	08:42 (LZ56)	17:44	18:19		31	07:36 (LZ45)	19:57	29	07:24 (LZ40)	20:31	21	06:39 (LZ32)	20:54		
20	07:38		08:16 (LZ56)	07:02	06:15			07:05 (LZ45)	06:20			06:55 (LZ40)	05:40	06:18 (LZ32)	05:27		
	17:03	26	08:42 (LZ56)	17:45	18:21		29	07:34 (LZ45)	19:58	29	07:24 (LZ40)	20:32	20	06:38 (LZ32)	20:55		
21	07:37		08:16 (LZ56)	07:01	06:13			07:06 (LZ45)	06:18			06:55 (LZ40)	05:39	06:19 (LZ32)	05:27		
	17:04	26	08:42 (LZ56)	17:46	18:22		26	07:32 (LZ45)	19:59	28	07:23 (LZ40)	20:33	18	06:37 (LZ32)	20:55		
22	07:37		08:17 (LZ56)	06:59	06:11			07:07 (LZ45)	06:17			06:54 (LZ40)	05:38	06:19 (LZ32)	05:27		
	17:06	26	08:43 (LZ56)	17:48	18:23		23	07:30 (LZ45)	20:00	28	07:22 (LZ40)	20:34	17	06:36 (LZ32)	20:55		
23	07:36		08:18 (LZ56)	06:58	06:09			07:09 (LZ45)	06:15			06:55 (LZ40)	05:37	06:20 (LZ32)	05:28		
	17:07	25	08:43 (LZ56)	17:49	18:24		18	07:27 (LZ45)	20:01	27	07:22 (LZ40)	20:35	16	06:36 (LZ32)	20:55		
24	07:35		08:18 (LZ56)	06:56	06:07			07:12 (LZ45)	06:14			06:55 (LZ40)	05:36	06:21 (LZ32)	05:28		
	17:08	24	08:42 (LZ56)	17:50	18:25		13	07:25 (LZ45)	20:03	26	07:21 (LZ40)	20:36	13	06:34 (LZ32)	20:55		
25	07:34		08:19 (LZ56)	06:54	06:05				06:12			06:56 (LZ40)	05:36	06:23 (LZ32)	05:28		
	17:09	23	08:42 (LZ56)	17:52	18:27				20:04	25	07:21 (LZ40)	20:37	11	06:34 (LZ32)	20:55		
26	07:33		08:20 (LZ56)	06:53	06:04				06:10			06:56 (LZ40)	05:35	06:24 (LZ32)	05:28		
	17:11	22	08:42 (LZ56)	17:53	18:28				20:05	23	07:19 (LZ40)	20:38	8	06:32 (LZ32)	20:56		
27	07:32		08:21 (LZ56)	06:51	06:02				06:09			06:57 (LZ40)	05:34	06:27 (LZ32)	05:29		
	17:12	20	08:41 (LZ56)	17:54	18:29				20:06	21	07:18 (LZ40)	20:39	2	06:29 (LZ32)	20:56		
28	07:31		08:22 (LZ56)	06:50	06:00				06:07			06:58 (LZ40)	05:33		05:29		
	17:14	18	08:40 (LZ56)	17:55	18:30				20:07	18	07:16 (LZ40)	20:40			20:56		
29	07:31		08:24 (LZ56)		06:58				06:06			07:00 (LZ40)	05:33		05:30		
	17:15	15	08:39 (LZ56)		19:31				20:09	14	07:14 (LZ40)	20:41			20:56		
30	07:30		08:26 (LZ56)		06:56				06:04			07:03 (LZ40)	05:32		05:30		
	17:16	11	08:37 (LZ56)		19:33				20:10	9	07:12 (LZ40)	20:42			20:55		
31	07:29		08:30 (LZ56)		06:55							05:31					
	17:18	4	08:34 (LZ56)		19:34							20:43					
Potential sun hours	289			293	369			402				456			462		
Total, worst case		658			646			471				415					
Sun reduction		0.28			0.31			0.40				0.47					
Oper. time red.		1.00			1.00			1.00				1.00					
Wind dir. red.		0.67			0.61			0.59				0.58					
Total reduction		0.19			0.19			0.23				0.27					
Total, real		122			121			110				113					

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		





SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZaG_02 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -83.7° Slope: 90.0° (52)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

July		August		September		October		November		December	
1	05:31	05:57	06:27 (LZ32)	06:32	07:04 (LZ40)	07:06	07:43 (LZ45)	06:44		07:22	07:56 (LZ56)
	20:55	20:34	06:49 (LZ32)	19:47	14	07:18 (LZ40)	18:52	08:19 (LZ45)	17:01	16:34	08:19 (LZ56)
2	05:31	05:58	06:27 (LZ32)	06:33		07:07 (LZ40)	07:07	07:43 (LZ45)	06:45	07:23	07:57 (LZ56)
	20:55	20:33	06:49 (LZ32)	19:45	7	07:14 (LZ40)	18:50	08:18 (LZ45)	17:00	16:33	08:20 (LZ56)
3	05:32	05:59	06:27 (LZ32)	06:34			07:08	07:43 (LZ45)	06:47	07:24	07:58 (LZ56)
	20:55	20:31	06:48 (LZ32)	19:43			18:49	08:18 (LZ45)	16:59	16:33	08:20 (LZ56)
4	05:32	06:00	06:28 (LZ32)	06:35			07:09	07:43 (LZ45)	06:48	07:26	07:59 (LZ56)
	20:55	20:30	06:47 (LZ32)	19:42			18:47	08:17 (LZ45)	16:57	16:33	08:20 (LZ56)
5	05:33	06:01	06:29 (LZ32)	06:36			07:10	07:44 (LZ45)	06:49	07:27	07:59 (LZ56)
	20:54	20:29	06:48 (LZ32)	19:40			18:45	08:17 (LZ45)	16:56	16:33	08:20 (LZ56)
6	05:33	06:02	06:30 (LZ32)	06:37			07:12	07:44 (LZ45)	06:51	07:28	08:00 (LZ56)
	20:54	20:28	06:46 (LZ32)	19:38			18:43	08:15 (LZ45)	16:55	16:32	08:20 (LZ56)
7	05:34	06:03	06:31 (LZ32)	06:38			07:13	07:45 (LZ45)	06:52	07:29	08:01 (LZ56)
	20:54	20:26	06:45 (LZ32)	19:36			18:41	08:14 (LZ45)	16:54	16:32	08:20 (LZ56)
8	05:35	06:05	06:33 (LZ32)	06:40			07:14	07:46 (LZ45)	06:53	07:30	08:02 (LZ56)
	20:53	20:25	06:43 (LZ32)	19:34			18:40	08:12 (LZ45)	16:52	16:32	08:20 (LZ56)
9	05:36	06:06		06:41			07:15	07:47 (LZ45)	06:55	07:31	08:03 (LZ56)
	20:53	20:24		19:33			18:38	08:10 (LZ45)	16:51	16:32	08:20 (LZ56)
10	05:36	06:07		06:42			07:16	07:49 (LZ45)	06:56	07:32	08:04 (LZ56)
	20:53	20:22		19:31			18:36	08:08 (LZ45)	16:50	16:32	08:20 (LZ56)
11	05:37	06:08		06:43			07:18	07:52 (LZ45)	06:57	07:32	08:05 (LZ56)
	20:52	20:21		19:29			18:34	08:04 (LZ45)	16:49	16:32	08:20 (LZ56)
12	05:38	06:09		06:44			07:19		06:59	07:33	08:06 (LZ56)
	20:52	20:19		19:27			18:33		16:48	16:32	08:20 (LZ56)
13	05:39	06:10	07:10 (LZ40)	06:45			07:20		07:00	07:34	08:06 (LZ56)
	20:51	20:18	07:20 (LZ40)	19:25			18:31		16:47	16:32	08:19 (LZ56)
14	05:39	06:11	07:07 (LZ40)	06:46			07:21		07:01	07:35	08:08 (LZ56)
	20:50	20:16	07:23 (LZ40)	19:23			18:29		16:46	16:32	08:19 (LZ56)
15	05:40	06:12	07:05 (LZ40)	06:47			07:22		07:03	07:36	08:09 (LZ56)
	20:50	20:15	07:24 (LZ40)	19:22			18:28		16:45	16:32	08:19 (LZ56)
16	05:41	06:14	07:04 (LZ40)	06:49			07:24		07:04	07:36	08:10 (LZ56)
	20:49	20:13	07:25 (LZ40)	19:20			18:26		16:44	16:33	08:19 (LZ56)
17	05:42	06:35 (LZ32)	06:15	07:02 (LZ40)	06:50		07:25		07:05	07:37	08:10 (LZ56)
	20:48	06:40 (LZ32)	20:12	07:26 (LZ40)	19:18		18:24		16:43	16:33	08:18 (LZ56)
18	05:43	06:33 (LZ32)	06:16	07:01 (LZ40)	06:51		07:26		07:06	07:38	08:12 (LZ56)
	20:48	06:43 (LZ32)	20:10	07:26 (LZ40)	19:16		18:23		16:42	16:33	08:19 (LZ56)
19	05:44	06:32 (LZ32)	06:17	07:01 (LZ40)	06:52	08:00 (LZ45)	07:27		07:08	07:38	08:13 (LZ56)
	20:47	06:44 (LZ32)	20:09	07:28 (LZ40)	19:14	10	08:10 (LZ45)	18:21	16:41	25	08:19 (LZ56)
20	05:45	06:31 (LZ32)	06:18	07:01 (LZ40)	06:53		07:56 (LZ45)	07:29	07:09	07:39	08:13 (LZ56)
	20:46	06:45 (LZ32)	20:07	07:28 (LZ40)	19:12	17	08:13 (LZ45)	18:19	16:40	26	08:19 (LZ56)
21	05:46	06:30 (LZ32)	06:19	07:00 (LZ40)	06:54		07:53 (LZ45)	07:30	07:10	07:40	08:14 (LZ56)
	20:45	06:47 (LZ32)	20:05	07:28 (LZ40)	19:11	22	08:15 (LZ45)	18:18	16:40	26	08:18 (LZ56)
22	05:47	06:29 (LZ32)	06:20	06:59 (LZ40)	06:55		07:52 (LZ45)	07:31	07:11	07:52 (LZ56)	07:40
	20:44	06:46 (LZ32)	20:04	07:28 (LZ40)	19:09	25	08:17 (LZ45)	18:16	16:39	26	08:18 (LZ56)
23	05:48	06:28 (LZ32)	06:21	06:59 (LZ40)	06:56		07:50 (LZ45)	07:32	07:13	07:53 (LZ56)	07:41
	20:43	06:47 (LZ32)	20:02	07:28 (LZ40)	19:07	28	08:18 (LZ45)	18:15	16:38	26	08:19 (LZ56)
24	05:49	06:28 (LZ32)	06:23	06:59 (LZ40)	06:58		07:48 (LZ45)	07:34	07:14	07:53 (LZ56)	07:41
	20:42	06:48 (LZ32)	20:01	07:27 (LZ40)	19:05	31	08:19 (LZ45)	18:13	16:37	26	08:19 (LZ56)
25	05:50	06:27 (LZ32)	06:24	06:58 (LZ40)	06:59		07:47 (LZ45)	06:35	07:15	07:53 (LZ56)	07:42
	20:41	06:48 (LZ32)	19:59	07:27 (LZ40)	19:03	32	08:19 (LZ45)	17:12	16:37	26	08:19 (LZ56)
26	05:51	06:27 (LZ32)	06:25	06:58 (LZ40)	07:00		07:46 (LZ45)	06:36	07:16	07:53 (LZ56)	07:42
	20:40	06:49 (LZ32)	19:57	07:26 (LZ40)	19:01	33	08:19 (LZ45)	17:10	16:36	26	08:19 (LZ56)
27	05:52	06:27 (LZ32)	06:26	06:59 (LZ40)	07:01		07:45 (LZ45)	06:38	07:18	07:54 (LZ56)	07:42
	20:39	06:49 (LZ32)	19:55	07:25 (LZ40)	19:00	34	08:19 (LZ45)	17:09	16:36	26	08:20 (LZ56)
28	05:53	06:27 (LZ32)	06:27	06:59 (LZ40)	07:02		07:44 (LZ45)	06:39	07:19	07:54 (LZ56)	07:43
	20:38	06:49 (LZ32)	19:54	07:24 (LZ40)	18:58	35	08:19 (LZ45)	17:07	16:35	26	08:20 (LZ56)
29	05:54	06:26 (LZ32)	06:28	06:59 (LZ40)	07:03		07:44 (LZ45)	06:40	07:20	07:55 (LZ56)	07:43
	20:37	06:49 (LZ32)	19:52	07:23 (LZ40)	18:56	36	08:20 (LZ45)	17:06	16:35	25	08:20 (LZ56)
30	05:55	06:26 (LZ32)	06:29	07:00 (LZ40)	07:05		07:44 (LZ45)	06:41	07:21	07:55 (LZ56)	07:43
	20:36	06:49 (LZ32)	19:50	07:22 (LZ40)	18:54	36	08:20 (LZ45)	17:04	16:34	25	08:20 (LZ56)
31	05:56	06:26 (LZ32)	06:31	07:01 (LZ40)				06:43			07:43
	20:35	06:49 (LZ32)	19:49	07:20 (LZ40)				17:03			16:41
Potential sun hours	468	433		376			342		291		279
Total, worst case	270	599		360			313		449		391
Sun reduction	0.59	0.65		0.59			0.47		0.36		0.26
Oper. time red.	1.00	1.00		1.00			1.00		1.00		1.00
Wind dir. red.	0.58	0.59		0.61			0.61		0.67		0.67
Total reduction	0.34	0.38		0.36			0.29		0.24		0.18
Total, real	92	228		131			91		109		69

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZaG_03 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 85.2° Slope: 90.0° (53)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January			February			March			April			May			June		
1	07:43			07:27	08:11 (LZ56)	06:48		07:12 (LZ45)	06:53		07:20 (LZ40)	06:03	05:31					
	16:42			17:19	28 16:30 (LZ54)	17:57	16	07:28 (LZ45)	19:35	2	07:22 (LZ40)	20:11	20:44					
2	07:44			07:26	08:13 (LZ56)	06:46		07:09 (LZ45)	06:51		07:14 (LZ40)	06:02	05:30					
	16:43			17:20	20 16:27 (LZ54)	17:58	20	07:29 (LZ45)	19:36	12	07:26 (LZ40)	20:12	20:45					
3	07:44			07:25	16:19 (LZ54)	06:45		07:08 (LZ45)	06:49		07:12 (LZ40)	06:00	05:30					
	16:44			17:22	5 16:24 (LZ54)	17:59	22	07:30 (LZ45)	19:37	16	07:28 (LZ40)	20:13	20:45					
4	07:44			07:24		06:43		07:07 (LZ45)	06:47		07:11 (LZ40)	05:59	05:29					
	16:45			17:23		18:01	25	07:32 (LZ45)	19:39	19	07:30 (LZ40)	20:15	20:46					
5	07:44			07:23		06:41		07:06 (LZ45)	06:46		07:09 (LZ40)	05:57	05:29					
	16:46			17:24		18:02	26	07:32 (LZ45)	19:40	21	07:30 (LZ40)	20:16	20:47					
6	07:43			07:22		06:39		07:05 (LZ45)	06:44		07:08 (LZ40)	05:56	05:29					
	16:47			17:26		18:03	27	07:32 (LZ45)	19:41	22	07:30 (LZ40)	20:17	20:48					
7	07:43			07:20		06:38		07:04 (LZ45)	06:42		07:07 (LZ40)	05:55	05:28					
	16:48			17:27		18:04	37	17:39 (LZ47)	19:42	23	07:30 (LZ40)	20:18	20:48					
8	07:43			07:19		06:36		07:04 (LZ45)	06:40		07:07 (LZ40)	05:53	05:28					
	16:49			17:29		18:06	43	17:42 (LZ47)	19:44	24	07:31 (LZ40)	20:19	20:49					
9	07:43	16:12 (LZ54)		07:18		06:34		07:04 (LZ45)	06:39		07:07 (LZ40)	05:52	05:28					
	16:50	5 16:17 (LZ54)		17:30		18:07	45	17:43 (LZ47)	19:45	24	07:31 (LZ40)	20:20	20:50					
10	07:43	16:11 (LZ54)		07:17		06:32		07:03 (LZ45)	06:37		07:06 (LZ40)	05:51	05:27					
	16:51	9 16:20 (LZ54)		17:31		18:08	49	17:44 (LZ47)	19:46	24	07:30 (LZ40)	20:21	20:50					
11	07:42	08:09 (LZ56)		07:15		06:31		07:03 (LZ45)	06:35		07:06 (LZ40)	05:50	05:27					
	16:52	17 16:21 (LZ54)		17:33		18:09	49	17:44 (LZ47)	19:47	23	07:29 (LZ40)	20:23	20:51					
12	07:42	08:07 (LZ56)		07:14		06:29		07:03 (LZ45)	06:33		07:07 (LZ40)	05:49	05:27					
	16:53	23 16:23 (LZ54)		17:34		18:11	49	17:44 (LZ47)	19:48	22	07:29 (LZ40)	20:24	20:51					
13	07:42	08:07 (LZ56)		07:13		06:27		07:04 (LZ45)	06:32		07:07 (LZ40)	05:47	05:27					
	16:54	27 16:24 (LZ54)		17:35		18:12	47	17:45 (LZ47)	19:49	20	07:27 (LZ40)	20:25	20:52					
14	07:41	08:06 (LZ56)		07:11		06:25		07:05 (LZ45)	06:30		07:07 (LZ40)	05:46	05:27					
	16:56	31 16:25 (LZ54)		17:37		18:13	46	17:45 (LZ47)	19:51	19	07:26 (LZ40)	20:26	20:52					
15	07:41	08:05 (LZ56)		07:10		06:24		07:06 (LZ45)	06:28		07:09 (LZ40)	05:45	05:27					
	16:57	34 16:26 (LZ54)		17:38		18:14	42	17:44 (LZ47)	19:52	16	07:25 (LZ40)	20:27	20:53					
16	07:40	08:05 (LZ56)		07:08		06:22		07:07 (LZ45)	06:27		07:11 (LZ40)	05:44	05:27					
	16:58	36 16:27 (LZ54)		17:40		18:16	38	17:43 (LZ47)	19:53	11	07:22 (LZ40)	20:28	20:53					
17	07:40	08:04 (LZ56)		07:07		06:20		07:09 (LZ45)	06:25			05:43	05:27					
	16:59	40 16:28 (LZ54)		17:41		18:17	32	17:42 (LZ47)	19:54			20:29	20:54					
18	07:39	08:05 (LZ56)		07:05		06:18		17:24 (LZ47)	06:23			05:42	05:27					
	17:00	40 16:29 (LZ54)		17:42		18:18	17	17:41 (LZ47)	19:55			20:30	20:54					
19	07:39	08:04 (LZ56)		07:04		06:16		17:25 (LZ47)	06:22			05:41	05:27					
	17:02	44 16:30 (LZ54)		17:44		18:19	14	17:39 (LZ47)	19:57			20:31	20:54					
20	07:38	08:04 (LZ56)		07:02		06:15		17:27 (LZ47)	06:20			05:40	05:27					
	17:03	44 16:30 (LZ54)		17:45		18:21	9	17:36 (LZ47)	19:58			20:32	20:55					
21	07:37	08:04 (LZ56)		07:01		06:13			06:18			05:39	05:27					
	17:04	44 16:30 (LZ54)		17:46		18:22			19:59			20:33	20:55					
22	07:37	08:05 (LZ56)		06:59		06:11			06:17			05:38	05:27					
	17:06	46 16:32 (LZ54)		17:48		18:23			20:00			20:34	20:55					
23	07:36	08:05 (LZ56)		06:58		06:09			06:15			05:37	05:28					
	17:07	46 16:32 (LZ54)		17:49		18:24			20:01			20:35	20:55					
24	07:35	08:05 (LZ56)		06:56		06:07			06:14			05:36	05:28					
	17:08	46 16:32 (LZ54)		17:50		18:25			20:03			20:36	20:55					
25	07:34	08:05 (LZ56)		06:54		06:05			06:12			05:36	05:28					
	17:09	46 16:32 (LZ54)		17:52		18:27			20:04			20:37	20:55					
26	07:33	08:05 (LZ56)		06:53		06:04			06:10			05:35	05:28					
	17:11	45 16:32 (LZ54)		17:53		18:28			20:05			20:38	20:56					
27	07:32	08:06 (LZ56)		06:51		06:02			06:09			05:34	05:29					
	17:12	44 16:32 (LZ54)		17:54		18:29			20:06			20:39	20:56					
28	07:32	08:07 (LZ56)		06:50	07:14 (LZ45)	06:00			06:07			05:33	05:29					
	17:14	42 16:32 (LZ54)	17:55	10 07:24 (LZ45)		18:30			20:07			20:40	20:56					
29	07:31	08:07 (LZ56)		06:58		06:58			06:06			05:33	05:30					
	17:15	41 16:32 (LZ54)		19:31		19:31			20:09			20:41	20:56					
30	07:30	08:08 (LZ56)		06:56		06:56			06:04			05:32	05:30					
	17:16	37 16:31 (LZ54)		19:33		19:33			20:10			20:42	20:55					
31	07:29	08:10 (LZ56)		06:55		06:55						05:31						
	17:18	32 16:30 (LZ54)		19:34		19:34						20:43						
Potential sun hours	289		293			369			402		456		462					
Total, worst case	819		63			653			298									
Sun reduction	0.28		0.29			0.31			0.40									
Oper. time red.	1.00		1.00			1.00			1.00									
Wind dir. red.	0.63		0.63			0.60			0.60									
Total reduction	0.18		0.18			0.18			0.24									
Total, real	145		11			120			71									

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZaG_03 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 85.2° Slope: 90.0° (53)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:55	05:57 20:34	06:32 19:47	07:06 (LZ40) 18:52	07:43 (LZ45) 18:24 (LZ47)	07:22 16:34
2	05:31 20:55	05:58 20:33	06:33 19:45	07:05 (LZ40) 18:50	07:42 (LZ45) 18:23 (LZ47)	07:23 16:33
3	05:32 20:55	05:59 20:31	06:34 19:43	07:05 (LZ40) 18:49	07:41 (LZ45) 18:22 (LZ47)	07:25 16:33
4	05:32 20:55	06:00 20:30	06:35 19:42	07:04 (LZ40) 18:47	07:40 (LZ45) 18:21 (LZ47)	07:26 16:33
5	05:33 20:54	06:01 20:29	06:36 19:40	07:04 (LZ40) 18:45	07:41 (LZ45) 18:20 (LZ47)	07:27 16:33
6	05:34 20:54	06:02 20:28	06:37 19:38	07:04 (LZ40) 18:43	07:40 (LZ45) 18:17 (LZ47)	07:28 16:32
7	05:34 20:54	06:04 20:26	06:38 19:36	07:04 (LZ40) 18:41	07:40 (LZ45) 18:13 (LZ47)	07:29 16:32
8	05:35 20:53	06:05 20:25	06:40 19:34	07:05 (LZ40) 18:40	07:40 (LZ45) 18:07 (LZ45)	07:30 16:32
9	05:36 20:53	06:06 20:24	06:41 19:33	07:06 (LZ40) 18:38	07:40 (LZ45) 18:06 (LZ45)	07:31 16:32
10	05:36 20:53	06:07 20:22	06:42 19:31	07:07 (LZ40) 18:36	07:42 (LZ45) 18:05 (LZ45)	07:32 16:32
11	05:37 20:52	06:08 20:21	06:43 19:29	07:11 (LZ40) 18:34	07:42 (LZ45) 18:04 (LZ45)	07:32 16:32
12	05:38 20:52	06:09 20:19	06:44 19:27	07:16 (LZ40) 18:33	07:44 (LZ45) 18:02 (LZ45)	07:33 16:32
13	05:39 20:51	06:10 20:18	06:45 19:25	07:20 18:31	07:45 (LZ45) 18:00	07:34 16:32
14	05:39 20:50	06:11 20:16	06:46 19:23	07:21 18:29	07:45 (LZ45) 18:00	07:35 16:32
15	05:40 20:50	06:12 20:15	06:47 19:22	07:22 18:28	07:46 (LZ45) 18:00	07:36 16:32
16	05:41 20:49	06:14 20:13	06:49 19:20	07:24 18:26	07:46 (LZ45) 18:00	07:36 16:33
17	05:42 20:48	06:15 20:12	06:50 19:18	07:25 18:24	07:47 (LZ45) 18:00	07:37 16:33
18	05:43 20:48	06:16 20:10	06:51 19:16	07:26 18:23	07:47 (LZ45) 18:00	07:38 16:33
19	05:44 20:47	06:17 20:09	06:52 19:14	07:27 18:21	07:48 (LZ45) 18:00	07:39 16:34
20	05:45 20:46	06:18 20:07	06:53 19:12	07:29 18:19	07:49 (LZ45) 18:00	07:39 16:34
21	05:46 20:45	06:19 20:05	06:54 19:11	07:30 18:18	07:50 (LZ45) 18:00	07:40 16:34
22	05:47 20:44	06:20 20:04	06:55 19:09	07:31 18:16	07:51 (LZ45) 18:00	07:40 16:35
23	05:48 20:43	06:21 20:02	06:57 19:07	18:12 (LZ47) 18:15	07:52 (LZ45) 18:00	07:41 16:35
24	05:49 20:42	06:23 20:01	06:58 19:05	18:09 (LZ47) 18:13	07:53 (LZ45) 18:00	07:42 (LZ56) 16:36
25	05:50 20:42	06:24 19:59	06:59 19:03	18:07 (LZ47) 18:12	07:54 (LZ45) 18:00	07:42 (LZ56) 16:37
26	05:51 20:41	06:25 19:57	07:00 19:01	07:53 (LZ45) 18:10	07:55 (LZ45) 18:00	07:43 (LZ56) 16:37
27	05:52 20:39	06:26 19:55	07:01 19:00	07:54 (LZ45) 18:09	07:56 (LZ45) 18:00	07:44 (LZ56) 16:38
28	05:53 20:38	06:27 19:54	07:02 18:58	07:47 (LZ45) 18:24 (LZ47)	07:57 (LZ45) 18:00	07:45 (LZ56) 16:39
29	05:54 20:37	06:28 19:52	07:03 18:56	07:46 (LZ45) 18:25 (LZ47)	07:58 (LZ45) 18:00	07:46 (LZ56) 16:40
30	05:55 20:36	06:29 19:50	07:04 18:54	07:44 (LZ45) 18:25 (LZ47)	07:59 (LZ45) 18:00	07:47 (LZ56) 16:40
31	05:56 20:35	06:31 19:49	07:06 19:49	07:06 (LZ40) 17:03	07:06 (LZ40) 17:03	07:43 16:41
Potential sun hours	468	433	376	342	291	279
Total, worst case		92	448	444	849	32
Sun reduction		0.65	0.59	0.47	0.36	0.26
Oper. time red.		1.00	1.00	1.00	1.00	1.00
Wind dir. red.		0.60	0.60	0.61	0.63	0.62
Total reduction		0.39	0.35	0.29	0.23	0.16
Total, real		36	159	127	196	5

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)



SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZaG_04 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 76.5° Slope: 90.0° (68)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January		February		March		April		May		June	
1	07:43 16:42		07:27 17:19	43 08:03 (LZ56) 16:51 (LZ54)	06:48 17:57		06:53 19:35		06:03 20:11		05:31 20:44	
2	07:44 16:43		07:26 17:20	43 08:03 (LZ56) 16:51 (LZ54)	06:46 17:58		06:51 19:36		06:02 20:12		05:30 20:45	
3	07:44 16:44		07:25 17:22	43 08:04 (LZ56) 16:52 (LZ54)	06:45 17:59		06:49 19:37		06:00 20:13		05:30 20:45	
4	07:44 16:45		07:24 17:23	43 08:05 (LZ56) 16:53 (LZ54)	06:43 18:01		06:47 19:39		05:59 20:15		05:29 20:46	
5	07:44 16:46		07:23 17:24	41 08:06 (LZ56) 16:53 (LZ54)	06:41 18:02		06:46 19:40		05:57 20:16		05:29 20:47	
6	07:43 16:47		07:22 17:26	39 08:08 (LZ56) 16:54 (LZ54)	06:39 18:03		06:44 19:41		05:56 20:17		05:29 20:48	
7	07:43 16:48		07:20 17:27	36 08:09 (LZ56) 16:53 (LZ54)	06:38 18:04		06:42 19:42		05:55 20:18		05:28 20:48	
8	07:43 16:49		07:19 17:29	29 08:12 (LZ56) 16:53 (LZ54)	06:36 18:06		06:40 19:43		05:53 20:19		05:28 20:49	
9	07:43 16:50		07:18 17:30	22 16:32 (LZ54) 16:54 (LZ54)	06:34 18:07	4 07:05 (LZ45) 07:09 (LZ45)	06:39 19:45		05:52 20:20		05:28 20:50	
10	07:43 16:51		07:17 17:31	22 16:31 (LZ54) 16:53 (LZ54)	06:32 18:08	14 07:00 (LZ45) 07:14 (LZ45)	06:37 19:46		05:51 20:21		05:27 20:50	
11	07:42 16:52		07:15 17:33	19 16:33 (LZ54) 16:52 (LZ54)	06:31 18:09	19 06:57 (LZ45) 07:16 (LZ45)	06:35 19:47		05:50 20:23		05:27 20:51	
12	07:42 16:53		07:14 17:34	18 16:33 (LZ54) 16:51 (LZ54)	06:29 18:11	23 06:54 (LZ45) 07:17 (LZ45)	06:33 19:48	5 07:02 (LZ40) 07:07 (LZ40)	05:49 20:24		05:27 20:51	
13	07:42 16:54		07:13 17:35	15 16:35 (LZ54) 16:50 (LZ54)	06:27 18:12	25 06:54 (LZ45) 07:19 (LZ45)	06:32 19:49	13 06:57 (LZ40) 07:10 (LZ40)	05:47 20:25		05:27 20:52	
14	07:41 16:56		07:11 17:37	11 16:37 (LZ54) 16:48 (LZ54)	06:25 18:13	28 06:52 (LZ45) 07:20 (LZ45)	06:30 19:51	17 06:55 (LZ40) 07:12 (LZ40)	05:46 20:26		05:27 20:52	
15	07:41 16:57		07:10 17:38		06:24 18:14	29 06:51 (LZ45) 07:20 (LZ45)	06:28 19:52	20 06:54 (LZ40) 07:14 (LZ40)	05:45 20:27		05:27 20:53	
16	07:40 16:58		07:08 17:40		06:22 18:16	41 06:50 (LZ45) 17:52 (LZ47)	06:27 19:53	22 06:52 (LZ40) 07:14 (LZ40)	05:44 20:28		05:27 20:53	
17	07:40 16:59		07:07 17:41		06:20 18:17	46 06:49 (LZ45) 17:54 (LZ47)	06:25 19:54	23 06:51 (LZ40) 07:14 (LZ40)	05:43 20:29		05:27 20:54	
18	07:39 17:00	8 08:08 (LZ56) 08:16 (LZ56)	07:05 17:42		06:18 18:18	50 06:48 (LZ45) 17:55 (LZ47)	06:23 19:55	25 06:50 (LZ40) 07:15 (LZ40)	05:42 20:30		05:27 20:54	
19	07:39 17:02	12 08:06 (LZ56) 08:18 (LZ56)	07:04 17:44		06:16 18:19	51 06:48 (LZ45) 17:56 (LZ47)	06:22 19:57	26 06:49 (LZ40) 07:15 (LZ40)	05:41 20:31		05:27 20:54	
20	07:38 17:03	15 08:04 (LZ56) 08:19 (LZ56)	07:02 17:45		06:15 18:21	52 06:48 (LZ45) 17:56 (LZ47)	06:20 19:58	26 06:50 (LZ40) 07:16 (LZ40)	05:40 20:32		05:27 20:55	
21	07:37 17:04	18 08:03 (LZ56) 08:21 (LZ56)	07:01 17:46		06:13 18:22	52 06:48 (LZ45) 17:56 (LZ47)	06:18 19:59	26 06:49 (LZ40) 07:15 (LZ40)	05:39 20:33		05:27 20:55	
22	07:37 17:06	19 08:04 (LZ56) 08:23 (LZ56)	06:59 17:48		06:11 18:23	51 06:48 (LZ45) 17:55 (LZ47)	06:17 20:00	26 06:48 (LZ40) 07:14 (LZ40)	05:38 20:34		05:27 20:55	
23	07:36 17:07	20 08:03 (LZ56) 08:23 (LZ56)	06:58 17:49		06:09 18:24	50 06:48 (LZ45) 17:55 (LZ47)	06:15 20:01	25 06:49 (LZ40) 07:14 (LZ40)	05:37 20:35		05:28 20:55	
24	07:35 17:08	21 08:03 (LZ56) 08:24 (LZ56)	06:56 17:50		06:07 18:25	48 06:49 (LZ45) 17:55 (LZ47)	06:14 20:03	24 06:49 (LZ40) 07:13 (LZ40)	05:36 20:36		05:28 20:55	
25	07:34 17:09	23 08:02 (LZ56) 08:25 (LZ56)	06:54 17:52		06:05 18:27	45 06:49 (LZ45) 17:54 (LZ47)	06:12 20:04	24 06:49 (LZ40) 07:13 (LZ40)	05:36 20:37		05:28 20:55	
26	07:33 17:11	23 08:02 (LZ56) 08:25 (LZ56)	06:53 17:53		06:04 18:28	39 06:50 (LZ45) 17:52 (LZ47)	06:10 20:05	22 06:49 (LZ40) 07:11 (LZ40)	05:35 20:38		05:28 20:56	
27	07:32 17:12	24 08:02 (LZ56) 08:26 (LZ56)	06:51 17:54		06:02 18:29	33 06:51 (LZ45) 17:50 (LZ47)	06:09 20:06	20 06:51 (LZ40) 07:11 (LZ40)	05:34 20:39		05:29 20:56	
28	07:32 17:14	29 08:02 (LZ56) 16:43 (LZ54)	06:50 17:55		06:00 18:30	23 06:53 (LZ45) 17:47 (LZ47)	06:07 20:07	18 06:51 (LZ40) 07:09 (LZ40)	05:33 20:40		05:29 20:56	
29	07:31 17:15	36 08:02 (LZ56) 16:46 (LZ54)			06:58 19:31	7 07:57 (LZ45) 08:04 (LZ45)	06:06 20:09	14 06:53 (LZ40) 07:07 (LZ40)	05:33 20:41		05:30 20:56	
30	07:30 17:16	39 08:02 (LZ56) 16:48 (LZ54)			06:56 19:33		06:04 20:10	9 06:56 (LZ40) 07:05 (LZ40)	05:32 20:42		05:30 20:55	
31	07:29 17:18	41 08:03 (LZ56) 16:50 (LZ54)			06:55 19:34				05:31 20:43			
Potential sun hours	289		293		369		402		456		462	
Total, worst case	328		424		730		385					
Sun reduction	0.28		0.29		0.31		0.40					
Oper. time red.	1.00		1.00		1.00		1.00					
Wind dir. red.	0.65		0.62		0.61		0.58					
Total reduction	0.18		0.18		0.19		0.23					
Total, real	60		77		136		89					

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZaG_04 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 76.5° Slope: 90.0° (68)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

		July	August		September		October		November		December		
1	05:31 20:55	05:57 20:34			06:32 19:47		07:06 18:52	25	07:33 (LZ45) 07:58 (LZ45)	06:44 17:01	21	16:01 (LZ54) 16:22 (LZ54)	07:22 16:34
2	05:31 20:55	05:58 20:33			06:33 19:45		07:07 18:50	21	07:34 (LZ45) 07:55 (LZ45)	06:45 17:00	22	16:00 (LZ54) 16:22 (LZ54)	07:23 16:33
3	05:32 20:55	05:59 20:31			06:34 19:43		07:08 18:49	17	07:36 (LZ45) 07:53 (LZ45)	06:47 16:59	30	07:41 (LZ56) 16:23 (LZ54)	07:24 16:33
4	05:32 20:55	06:00 20:30			06:35 19:42		07:09 18:47	10	07:39 (LZ45) 07:49 (LZ45)	06:48 16:57	37	07:38 (LZ56) 16:23 (LZ54)	07:26 16:33
5	05:33 20:54	06:01 20:29			06:36 19:40		07:10 18:45			06:49 16:56	40	07:37 (LZ56) 16:24 (LZ54)	07:27 16:33
6	05:34 20:54	06:02 20:28			06:37 19:38		07:12 18:43			06:51 16:55	42	07:36 (LZ56) 16:23 (LZ54)	07:28 16:32
7	05:34 20:54	06:04 20:26			06:38 19:36		07:13 18:41			06:52 16:54	43	07:35 (LZ56) 16:23 (LZ54)	07:29 16:32
8	05:35 20:53	06:05 20:25			06:40 19:34		07:14 18:40			06:53 16:52	44	07:35 (LZ56) 16:23 (LZ54)	07:30 16:32
9	05:36 20:53	06:06 20:24			06:41 19:33		07:15 18:38			06:55 16:51	43	07:34 (LZ56) 16:22 (LZ54)	07:31 16:32
10	05:36 20:53	06:07 20:22			06:42 19:31		07:16 18:36			06:56 16:50	43	07:34 (LZ56) 16:22 (LZ54)	07:32 16:32
11	05:37 20:52	06:08 20:21			06:43 19:29		07:18 18:34			06:57 16:49	40	07:34 (LZ56) 16:20 (LZ54)	07:32 16:32
12	05:38 20:52	06:09 20:19	1	07:08 (LZ40) 07:09 (LZ40)	06:44 19:27		07:19 18:33			06:59 16:48	39	07:33 (LZ56) 16:19 (LZ54)	07:33 16:32
13	05:39 20:51	06:10 20:18	11	07:03 (LZ40) 07:14 (LZ40)	06:45 19:25		07:20 18:31			07:00 16:47	36	07:34 (LZ56) 16:18 (LZ54)	07:34 16:32
14	05:39 20:50	06:11 20:16	16	07:00 (LZ40) 07:16 (LZ40)	06:46 19:23	5	07:21 07:54 (LZ45)	18:29		07:01 16:46	28	07:34 (LZ56) 16:14 (LZ54)	07:35 16:32
15	05:40 20:50	06:12 20:15	18	06:59 (LZ40) 07:17 (LZ40)	06:47 19:22	20	07:22 18:36 (LZ47)	18:28		07:03 16:45	24	07:35 (LZ56) 07:59 (LZ56)	07:36 16:32
16	05:41 20:49	06:14 20:13	21	06:57 (LZ40) 07:18 (LZ40)	06:49 19:20	31	07:24 18:41 (LZ47)	18:24		07:04 16:44	23	07:35 (LZ56) 07:58 (LZ56)	07:36 16:33
17	05:42 20:48	06:15 20:12	22	06:56 (LZ40) 07:18 (LZ40)	06:50 19:18	38	07:25 18:40 (LZ47)	18:24		07:05 16:43	23	07:35 (LZ56) 07:58 (LZ56)	07:37 16:33
18	05:43 20:48	06:16 20:10	24	06:55 (LZ40) 07:19 (LZ40)	06:51 19:16	43	07:26 18:41 (LZ47)	18:23		07:06 16:42	21	07:37 (LZ56) 07:58 (LZ56)	07:38 16:33
19	05:44 20:47	06:17 20:09	25	06:55 (LZ40) 07:20 (LZ40)	06:52 19:14	46	07:27 18:41 (LZ47)	18:21		07:08 16:41	20	07:37 (LZ56) 07:57 (LZ56)	07:38 16:34
20	05:45 20:46	06:18 20:07	25	06:55 (LZ40) 07:20 (LZ40)	06:53 19:12	49	07:29 18:41 (LZ47)	18:19		07:09 16:40	19	07:39 (LZ56) 07:58 (LZ56)	07:39 16:34
21	05:46 20:45	06:19 20:05	26	06:54 (LZ40) 07:20 (LZ40)	06:54 19:11	51	07:30 18:41 (LZ47)	18:18		07:10 16:40	18	07:39 (LZ56) 07:57 (LZ56)	07:40 16:34
22	05:47 20:44	06:20 20:04	26	06:54 (LZ40) 07:20 (LZ40)	06:55 19:09	52	07:31 (LZ45) 18:41 (LZ47)	18:16		07:11 16:39	15	07:40 (LZ56) 07:55 (LZ56)	07:40 16:35
23	05:48 20:43	06:21 20:02	26	06:53 (LZ40) 07:19 (LZ40)	06:56 19:07	52	07:32 (LZ45) 18:41 (LZ47)	18:15		07:13 16:38	12	07:43 (LZ56) 07:55 (LZ56)	07:41 16:35
24	05:49 20:42	06:23 20:01	26	06:53 (LZ40) 07:19 (LZ40)	06:58 19:05	52	07:34 (LZ45) 18:40 (LZ47)	18:13		07:14 16:37	9	07:44 (LZ56) 07:53 (LZ56)	07:41 16:36
25	05:50 20:41	06:24 19:59	25	06:53 (LZ40) 07:18 (LZ40)	06:59 19:03	50	07:35 (LZ45) 18:38 (LZ47)	18:12		07:15 16:37			07:42 16:37
26	05:51 20:40	06:25 19:57	23	06:54 (LZ40) 07:17 (LZ40)	07:00 19:01	48	07:36 (LZ45) 18:37 (LZ47)	18:10		07:16 16:36			07:42 16:37
27	05:52 20:39	06:26 19:55	22	06:54 (LZ40) 07:16 (LZ40)	07:01 19:00	43	07:38 (LZ45) 18:34 (LZ47)	18:09	16:09 (LZ54)	07:18 16:36			07:42 16:38
28	05:53 20:38	06:27 19:54	19	06:55 (LZ40) 07:14 (LZ40)	07:02 18:58	36	07:39 (LZ45) 18:31 (LZ47)	18:07	6	16:15 (LZ54) 16:06 (LZ54)			07:43 16:39
29	05:54 20:37	06:28 19:52	17	06:56 (LZ40) 07:13 (LZ40)	07:03 18:56	29	07:40 (LZ45) 08:01 (LZ45)	18:06	11	16:17 (LZ54) 16:04 (LZ54)			07:43 16:39
30	05:55 20:36	06:29 19:50	12	06:58 (LZ40) 07:10 (LZ40)	07:05 18:54	26	07:41 (LZ45) 07:59 (LZ45)	18:04	16	16:20 (LZ54) 16:03 (LZ54)			07:43 16:40
31	05:56 20:35	06:31 19:49	5	07:01 (LZ40) 07:06 (LZ40)			06:43 17:03	20	16:02 (LZ54) 16:22 (LZ54)	07:21 16:34			07:43 16:41
Potential sun hours	468	433			376		342			291			279
Total, worst case		390			671		144			692			
Sun reduction		0.65			0.59		0.47			0.36			
Oper. time red.		1.00			1.00		1.00			1.00			
Wind dir. red.		0.58			0.61		0.61			0.64			
Total reduction		0.38			0.36		0.29			0.23			
Total, real		147			242		41			161			

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZeM_01 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -91.1° Slope: 90.0° (48)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2.61 3.03 3.64 5.32 6.89 7.61 8.86 9.04 7.43 5.21 3.54 2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:44 16:42	07:27 17:19	06:48 17:57	06:53 19:35	07:49 (LZ21) 08:10 (LZ21)	06:03 20:11	05:31 20:44	05:57 20:55	06:32 19:47	07:34 (LZ21) 08:18 (LZ21)	07:06 18:52	18:02 (LZ22) 17:01	06:44 16:34
2	07:44 16:43	07:26 17:20	06:46 17:58	06:51 19:36	07:46 (LZ21) 08:12 (LZ21)	06:02 20:12	05:30 20:45	05:58 20:55	06:33 19:45	07:34 (LZ21) 08:17 (LZ21)	07:07 18:50	18:04 (LZ22) 17:00	06:45 16:33
3	07:44 16:44	07:25 17:22	06:45 17:59	06:49 19:38	07:44 (LZ21) 08:14 (LZ21)	06:00 20:13	05:30 20:45	05:59 20:55	06:34 19:43	07:34 (LZ21) 08:16 (LZ21)	07:08 18:49	18:15 (LZ22) 17:00	06:47 16:33
4	07:44 16:45	07:24 17:23	06:43 18:01	06:47 19:39	07:42 (LZ21) 08:16 (LZ21)	05:59 20:15	05:29 20:46	06:00 20:55	06:35 19:42	07:34 (LZ21) 08:15 (LZ21)	07:09 18:47	18:15 (LZ22) 17:00	06:48 16:33
5	07:44 16:46	07:23 17:24	06:41 18:02	06:46 19:40	07:41 (LZ21) 08:16 (LZ21)	05:57 20:16	05:29 20:47	06:01 20:55	06:36 19:40	07:35 (LZ21) 08:14 (LZ21)	07:10 18:45	18:15 (LZ22) 17:00	06:49 16:32
6	07:44 16:47	07:22 17:26	06:39 18:03	06:44 19:41	07:39 (LZ21) 08:17 (LZ21)	05:56 20:17	05:28 20:48	06:02 20:54	06:37 19:38	07:35 (LZ21) 08:13 (LZ21)	07:12 18:43	18:15 (LZ22) 17:00	06:51 16:32
7	07:43 16:48	07:21 17:27	06:38 18:04	06:42 19:42	07:38 (LZ21) 08:17 (LZ21)	05:55 20:18	05:28 20:48	06:03 20:54	06:38 19:36	07:36 (LZ21) 08:11 (LZ21)	07:13 18:41	18:15 (LZ22) 17:00	06:52 16:32
8	07:43 16:49	07:19 17:29	06:36 18:06	06:40 19:44	07:37 (LZ21) 08:18 (LZ21)	05:53 20:19	05:28 20:49	06:05 20:54	06:40 19:34	07:36 (LZ21) 08:10 (LZ21)	07:14 18:40	18:15 (LZ22) 17:00	06:53 16:32
9	07:43 16:50	07:18 17:30	06:34 18:07	06:39 19:45	07:36 (LZ21) 08:18 (LZ21)	05:52 20:20	05:28 20:50	06:06 20:53	06:41 19:33	07:38 (LZ21) 08:08 (LZ21)	07:15 18:38	18:15 (LZ22) 17:00	06:55 16:32
10	07:43 16:51	07:17 17:31	06:32 18:08	06:37 19:46	07:35 (LZ21) 08:18 (LZ21)	05:51 20:22	05:27 20:50	06:07 20:53	06:42 19:31	07:39 (LZ21) 08:06 (LZ21)	07:16 18:36	18:15 (LZ22) 17:00	06:56 16:32
11	07:42 16:52	07:15 17:33	06:31 18:09	06:35 19:47	07:34 (LZ21) 08:18 (LZ21)	05:50 20:23	05:27 20:51	06:08 20:52	06:43 19:29	07:41 (LZ21) 08:03 (LZ21)	07:18 18:34	18:15 (LZ22) 17:00	06:57 16:32
12	07:42 16:53	07:14 17:34	06:29 18:11	06:33 19:48	07:33 (LZ21) 08:18 (LZ21)	05:48 20:24	05:27 20:51	06:09 20:52	06:44 19:27	07:44 (LZ21) 08:03 (LZ21)	07:19 18:33	18:15 (LZ22) 17:00	06:59 16:32
13	07:42 16:54	07:13 17:35	06:27 18:12	06:32 19:50	07:32 (LZ21) 08:18 (LZ21)	05:47 20:25	05:27 20:52	06:10 20:51	06:45 19:25	07:54 (LZ21) 08:04 (LZ21)	07:20 18:31	18:15 (LZ22) 17:00	07:00 16:32
14	07:41 16:55	07:11 17:37	06:25 18:13	06:30 19:51	07:33 (LZ21) 08:17 (LZ21)	05:46 20:26	05:27 20:52	06:11 20:50	06:46 19:23	07:50 (LZ21) 08:08 (LZ21)	07:21 18:29	18:15 (LZ22) 17:00	07:01 16:32
15	07:41 16:57	07:10 17:38	06:24 18:14	06:28 19:52	07:33 (LZ21) 08:17 (LZ21)	05:45 20:27	05:27 20:53	06:12 20:50	06:47 19:23	07:47 (LZ21) 08:10 (LZ21)	07:22 18:28	18:15 (LZ22) 17:00	07:03 16:32
16	07:40 16:58	07:08 17:39	06:22 18:16	06:27 19:53	07:33 (LZ21) 08:17 (LZ21)	05:44 20:28	05:27 20:53	06:14 20:49	06:48 19:26	07:45 (LZ21) 08:11 (LZ21)	07:24 18:26	18:15 (LZ22) 17:00	07:04 16:33
17	07:40 16:59	07:07 17:41	06:20 18:17	06:25 19:54	07:32 (LZ21) 08:16 (LZ21)	05:43 20:29	05:27 20:54	06:15 20:48	06:50 19:18	07:44 (LZ21) 08:13 (LZ21)	07:25 18:24	18:15 (LZ22) 17:00	07:05 16:33
18	07:39 17:00	07:05 17:42	06:18 18:18	06:23 19:56	07:33 (LZ21) 08:16 (LZ21)	05:42 20:30	05:27 20:54	06:16 20:48	06:51 19:16	07:42 (LZ21) 08:14 (LZ21)	07:26 18:23	18:15 (LZ22) 17:00	07:06 16:33
19	07:39 17:02	07:04 17:44	06:16 18:19	06:22 19:57	07:33 (LZ21) 08:14 (LZ21)	05:41 20:31	05:27 20:54	06:17 20:47	06:52 19:14	07:41 (LZ21) 08:15 (LZ21)	07:27 18:21	18:15 (LZ22) 17:00	07:08 16:34
20	07:38 17:03	07:02 17:45	06:15 18:21	06:20 19:58	07:34 (LZ21) 08:14 (LZ21)	05:40 20:32	05:27 20:55	06:18 20:46	06:53 19:12	07:40 (LZ21) 08:17 (LZ21)	07:29 18:19	18:15 (LZ22) 17:00	07:09 16:34
21	07:37 17:04	07:01 17:46	06:13 18:22	06:18 19:59	07:34 (LZ21) 08:13 (LZ21)	05:39 20:34	05:27 20:55	06:19 20:45	06:54 19:08	07:39 (LZ21) 08:17 (LZ21)	07:30 18:18	18:15 (LZ22) 17:00	07:10 16:34
22	07:37 17:05	06:59 17:48	06:11 18:23	06:17 20:00	07:34 (LZ21) 08:11 (LZ21)	05:38 20:35	05:27 20:55	06:20 20:44	06:55 19:04	07:38 (LZ21) 08:18 (LZ21)	07:31 18:16	18:15 (LZ22) 17:00	07:12 16:35
23	07:36 17:07	06:58 17:49	06:09 18:24	06:15 20:01	07:35 (LZ21) 08:11 (LZ21)	05:37 20:36	05:27 20:55	06:21 20:43	06:56 19:02	07:37 (LZ21) 08:18 (LZ21)	07:33 18:15	18:15 (LZ22) 17:00	07:13 16:35
24	07:35 17:08	06:56 17:50	06:07 18:25	06:14 20:03	07:35 (LZ21) 08:09 (LZ21)	05:36 20:37	05:28 20:55	06:23 20:43	06:58 19:05	07:36 (LZ21) 08:18 (LZ21)	07:34 18:13	18:15 (LZ22) 17:00	07:14 16:36
25	07:34 17:09	06:54 17:51	06:05 18:27	06:12 20:04	07:36 (LZ21) 08:08 (LZ21)	05:36 20:37	05:28 20:56	06:24 20:42	06:59 19:03	07:36 (LZ21) 08:18 (LZ21)	06:59 18:12	18:15 (LZ22) 17:00	07:15 16:37
26	07:33 17:11	06:53 17:53	06:04 18:28	06:10 20:05	07:37 (LZ21) 08:06 (LZ21)	05:35 20:38	05:28 20:56	06:25 20:41	06:59 19:01	07:35 (LZ21) 08:19 (LZ21)	07:36 18:10	18:15 (LZ22) 17:00	07:16 16:37
27	07:32 17:12	06:51 17:54	06:02 18:29	06:09 20:06	07:39 (LZ21) 08:04 (LZ21)	05:34 20:39	05:29 20:56	06:26 20:40	07:01 19:56	07:35 (LZ21) 08:18 (LZ21)	07:01 18:09	18:15 (LZ22) 17:00	07:18 16:38
28	07:32 17:13	06:50 17:55	06:00 18:30	06:07 20:07	07:40 (LZ21) 08:02 (LZ21)	05:33 20:40	05:29 20:56	06:27 20:38	07:02 19:54	07:34 (LZ21) 08:18 (LZ21)	07:33 18:07	18:15 (LZ22) 17:00	07:19 16:39
29	07:31 17:15	06:49 18:31	05:58 19:31	06:06 20:09	07:43 (LZ21) 08:09 (LZ21)	05:33 20:41	05:30 20:56	06:28 20:37	07:03 19:52	07:34 (LZ21) 08:18 (LZ21)	07:03 18:06	18:15 (LZ22) 17:00	07:20 16:39
30	07:30 17:16	06:48 18:33	05:56 19:33	06:04 20:10	07:47 (LZ21) 08:10 (LZ21)	05:32 20:42	05:30 20:56	06:29 20:36	07:04 19:50	07:35 (LZ21) 08:19 (LZ21)	07:04 18:05	18:15 (LZ22) 17:00	07:21 16:40
31	07:29 17:18	06:47 18:34	05:55 19:34	06:03 20:11	07:53 (LZ21) 08:07 (LZ21)	05:31 20:43	05:30 20:57	06:30 20:37	07:05 19:49	07:36 (LZ21) 08:20 (LZ21)	07:05 18:04	18:15 (LZ22) 17:00	07:22 16:41
Potential sun hours	289	293	369	402	456	462	468	433	376	342	291	279	
Total, worst case			297	1060				676	667		26		
Sun reduction			0.31	0.40				0.65	0.59		0.47		
Oper. time red.			1.00	1.00				1.00	1.00		1.00		
Wind dir. red.			0.59	0.61				0.61	0.60		0.59		
Total reduction			0.18	0.24				0.39	0.36		0.28		
Total, real			53	257				267	237		7		

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZeM_02 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -90.0° Slope: 90.0° (49)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March	April	May	June
1	07:44 16:42	07:27 17:19	06:48 17:57	06:53 19:35	18:31 (LZ22) 18:50 (LZ22)	06:03 20:11
2	07:44 16:43	07:26 17:20	06:46 17:58	06:51 19:36	18:32 (LZ22) 18:48 (LZ22)	06:02 20:12
3	07:44 16:44	07:25 17:22	06:45 17:59	06:49 19:38	18:34 (LZ22) 18:46 (LZ22)	06:00 20:13
4	07:44 16:45	07:24 17:23	06:43 18:01	06:47 19:39	18:38 (LZ22) 18:43 (LZ22)	05:59 20:15
5	07:44 16:46	07:23 17:24	06:41 18:02	06:46 19:40	05:57 20:16	05:29 20:47
6	07:44 16:47	07:22 17:26	06:39 18:03	06:44 19:41	05:56 20:17	05:28 20:48
7	07:43 16:48	07:21 17:27	06:38 18:04	06:42 19:42	05:55 20:18	05:28 20:48
8	07:43 16:49	07:19 17:29	06:36 18:06	06:40 19:44	05:53 20:19	05:28 20:49
9	07:43 16:50	07:18 17:30	06:34 18:07	06:39 19:45	05:52 20:20	05:28 20:50
10	07:43 16:51	07:17 17:31	06:32 18:08	06:37 19:46	05:51 20:22	05:27 20:50
11	07:42 16:52	07:15 17:33	06:31 18:09	06:35 19:47	05:50 20:23	05:27 20:51
12	07:42 16:53	07:14 17:34	06:29 18:11	06:33 19:48	05:48 20:24	05:27 20:51
13	07:42 16:54	07:13 17:35	06:27 18:12	06:32 19:50	05:47 20:25	05:27 20:52
14	07:41 16:55	07:11 17:37	06:25 18:13	06:30 19:51	05:46 20:26	05:27 20:52
15	07:41 16:57	07:10 17:38	06:24 18:14	06:28 19:52	05:45 20:27	05:27 20:53
16	07:40 16:58	07:08 17:39	06:22 18:16	06:27 19:53	05:44 20:28	05:27 20:53
17	07:40 16:59	07:07 17:41	06:20 18:17	06:25 19:54	05:43 20:29	05:27 20:54
18	07:39 17:00	07:05 17:42	06:18 18:18	06:23 19:55	05:42 20:30	05:27 20:54
19	07:39 17:02	07:04 17:44	06:16 18:19	06:22 19:57	05:41 20:31	05:27 20:54
20	07:38 17:03	07:02 17:45	06:15 18:21	06:20 19:58	05:40 20:32	05:27 20:55
21	07:37 17:04	07:01 17:46	06:13 18:22	06:18 19:59	05:39 20:34	05:27 20:55
22	07:37 17:05	06:59 17:48	06:11 18:23	06:17 20:00	05:38 20:35	05:27 20:55
23	07:36 17:07	06:58 17:49	06:09 18:24	06:15 20:01	05:37 20:36	05:27 20:55
24	07:35 17:08	06:56 17:50	06:07 18:25	06:14 20:03	05:36 20:37	05:28 20:55
25	07:34 17:09	06:54 17:51	06:05 18:27	06:12 20:04	05:36 20:37	05:28 20:56
26	07:33 17:11	06:53 17:53	06:04 18:28	06:10 20:05	05:35 20:38	05:28 20:56
27	07:32 17:12	06:51 17:54	06:02 18:29	06:09 20:06	05:34 20:39	05:29 20:56
28	07:32 17:13	06:50 17:55	06:00 18:30	06:07 20:07	05:33 20:40	05:29 20:56
29	07:31 17:15	06:58 19:31	06:58 18:53	06:06 20:09	05:33 20:41	05:30 20:56
30	07:30 17:16	06:56 19:33	06:56 18:53	06:04 20:10	05:32 20:42	05:30 20:55
31	07:29 17:18	06:55 19:34	06:55 18:52	06:03 20:11	05:31 20:43	05:30 20:55
Potential sun hours	289	293	369	402	456	462
Total, worst case			220	339	1371	526
Sun reduction			0.31	0.40	0.47	0.49
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.60	0.59	0.58	0.58
Total reduction			0.18	0.23	0.27	0.29
Total, real			40	79	375	152

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZeM_02 - Shadow Receptor: 1.0 ? 1.0 Azimuth: -90.0° Slope: 90.0° (49)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:55	07:21 (LZ21) 07:40 (LZ21)	05:57 20:34	07:10 (LZ21) 07:58 (LZ21)	06:32 19:47	07:06 18:52
2	05:31 20:55	07:20 (LZ21) 07:40 (LZ21)	05:58 20:33	07:10 (LZ21) 07:58 (LZ21)	06:33 19:45	07:07 18:50
3	05:32 20:55	07:20 (LZ21) 07:41 (LZ21)	05:59 20:31	07:10 (LZ21) 07:58 (LZ21)	06:34 19:43	07:08 18:49
4	05:32 20:55	07:19 (LZ21) 07:42 (LZ21)	06:00 20:30	07:10 (LZ21) 07:58 (LZ21)	06:35 19:42	07:09 18:47
5	05:33 20:55	07:19 (LZ21) 07:43 (LZ21)	06:01 20:29	07:10 (LZ21) 07:58 (LZ21)	06:36 19:40	07:10 18:45
6	05:33 20:54	07:19 (LZ21) 07:44 (LZ21)	06:02 20:28	07:11 (LZ21) 07:59 (LZ21)	06:37 19:38	07:12 18:43
7	05:34 20:54	07:18 (LZ21) 07:44 (LZ21)	06:03 20:26	07:11 (LZ21) 07:58 (LZ21)	06:38 19:36	07:13 18:41
8	05:35 20:54	07:18 (LZ21) 07:46 (LZ21)	06:05 20:25	07:11 (LZ21) 07:58 (LZ21)	06:40 19:34	07:14 18:36
9	05:35 20:53	07:18 (LZ21) 07:47 (LZ21)	06:06 20:24	07:11 (LZ21) 07:57 (LZ21)	06:41 19:33	07:15 18:38
10	05:36 20:53	07:17 (LZ21) 07:47 (LZ21)	06:07 20:22	07:11 (LZ21) 07:57 (LZ21)	06:42 19:31	07:16 18:36
11	05:37 20:52	07:16 (LZ21) 07:48 (LZ21)	06:08 20:21	07:12 (LZ21) 07:56 (LZ21)	06:43 19:29	07:18 18:34
12	05:38 20:52	07:16 (LZ21) 07:49 (LZ21)	06:09 20:19	07:12 (LZ21) 07:55 (LZ21)	06:44 19:27	07:19 18:33
13	05:39 20:51	07:16 (LZ21) 07:50 (LZ21)	06:10 20:18	07:13 (LZ21) 07:54 (LZ21)	06:45 19:25	07:20 18:31
14	05:39 20:50	07:15 (LZ21) 07:50 (LZ21)	06:11 20:16	07:13 (LZ21) 07:53 (LZ21)	06:46 19:23	07:21 18:29
15	05:40 20:50	07:14 (LZ21) 07:51 (LZ21)	06:12 20:15	07:14 (LZ21) 07:52 (LZ21)	06:47 19:22	07:22 18:28
16	05:41 20:49	07:14 (LZ21) 07:52 (LZ21)	06:14 20:13	07:15 (LZ21) 07:51 (LZ21)	06:49 19:20	07:24 18:26
17	05:42 20:48	07:14 (LZ21) 07:53 (LZ21)	06:15 20:12	07:16 (LZ21) 07:49 (LZ21)	06:50 19:18	07:25 18:24
18	05:43 20:48	07:14 (LZ21) 07:53 (LZ21)	06:16 20:10	07:17 (LZ21) 07:47 (LZ21)	06:51 19:16	07:26 18:23
19	05:44 20:47	07:13 (LZ21) 07:54 (LZ21)	06:17 20:09	07:19 (LZ21) 07:45 (LZ21)	06:52 19:14	07:27 18:21
20	05:45 20:46	07:13 (LZ21) 07:55 (LZ21)	06:18 20:07	07:22 (LZ21) 07:43 (LZ21)	06:53 19:12	07:29 18:19
21	05:46 20:45	07:12 (LZ21) 07:54 (LZ21)	06:19 20:05	07:25 (LZ21) 07:39 (LZ21)	06:54 19:11	07:30 18:18
22	05:47 20:44	07:12 (LZ21) 07:55 (LZ21)	06:20 20:04	06:55 19:09	18:24 (LZ22) 18:35 (LZ22)	07:31 18:16
23	05:48 20:43	07:11 (LZ21) 07:56 (LZ21)	06:21 20:02	06:56 19:07	18:35 (LZ22) 18:15	07:33 16:38
24	05:49 20:43	07:11 (LZ21) 07:56 (LZ21)	06:23 20:01	06:58 19:05	07:34 18:13	07:14 16:37
25	05:50 20:42	07:11 (LZ21) 07:57 (LZ21)	06:24 19:59	06:59 19:03	07:15 17:12	16:36 16:37
26	05:51 20:41	07:11 (LZ21) 07:57 (LZ21)	06:25 19:57	07:00 19:01	06:36 17:10	07:16 16:36
27	05:52 20:40	07:10 (LZ21) 07:57 (LZ21)	06:26 19:56	07:01 19:00	06:38 17:09	07:18 16:36
28	05:53 20:38	07:10 (LZ21) 07:58 (LZ21)	06:27 19:54	07:02 18:58	06:39 17:07	07:19 16:35
29	05:54 20:37	07:10 (LZ21) 07:58 (LZ21)	06:28 19:52	07:03 18:56	06:40 17:06	07:20 16:35
30	05:55 20:36	07:10 (LZ21) 07:58 (LZ21)	06:29 19:50	07:05 18:54	06:42 17:04	07:21 16:34
31	05:56 20:35	07:10 (LZ21) 07:58 (LZ21)	06:31 19:49		06:43 17:03	07:43 16:41
Potential sun hours	468	433	376	342	291	279
Total, worst case	1121	840	270			
Sun reduction	0.59	0.65	0.59			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.58	0.58	0.60			
Total reduction	0.34	0.38	0.36			
Total, real	384	317	96			

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		





SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZeM_03 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 85.1° Slope: 90.0° (50)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2.61 3.03 3.64 5.32 6.89 7.61 8.86 9.04 7.43 5.21 3.54 2.37

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
1,100 811 599 537 466 626 951 657 457 913 862 781 8,760

	January	February	March	April	May	June
1	07:44 16:42	07:28 17:19	06:48 17:57	16:56 (LZ30) 17:12 (LZ30)	06:53 19:35	18:22 (LZ22) 20:11
2	07:44 16:43	07:26 17:20	06:46 17:58	16:58 (LZ30) 17:09 (LZ30)	06:51 19:36	18:22 (LZ22) 20:12
3	07:44 16:44	07:25 17:22	06:45 17:59	06:49 19:38	18:22 (LZ22) 20:13	06:00 16
4	07:44 16:45	07:24 17:23	06:43 18:01	06:47 19:39	18:23 (LZ22) 20:15	05:59 11
5	07:44 16:46	07:23 17:24	06:41 18:02	06:46 19:40	18:23 (LZ22) 20:16	05:57 20:47
6	07:44 16:47	07:22 17:26	06:39 18:03	06:44 19:41	18:24 (LZ22) 20:17	05:56 20:48
7	07:43 16:48	07:21 17:27	06:38 18:04	06:42 19:42	18:25 (LZ22) 20:18	05:55 20:48
8	07:43 16:49	07:19 17:29	06:36 18:06	06:40 19:44	18:27 (LZ22) 20:19	05:53 20:49
9	07:43 16:50	07:18 17:30	06:34 18:07	06:39 19:45	18:29 (LZ22) 20:20	05:52 20:50
10	07:43 16:51	07:17 17:31	06:32 18:08	06:37 19:46	05:51 20:22	05:50 20:50
11	07:43 16:52	07:15 17:33	06:31 18:09	06:35 19:47	07:12 (LZ21) 07:19 (LZ21)	05:50 20:23
12	07:42 16:53	07:14 17:34	06:29 18:11	06:33 19:48	07:08 (LZ21) 07:23 (LZ21)	05:48 20:24
13	07:42 16:54	07:13 17:35	06:27 18:12	06:32 19:50	07:05 (LZ21) 07:25 (LZ21)	05:47 20:25
14	07:41 16:56	07:11 17:37	06:25 18:13	06:30 19:51	07:03 (LZ21) 07:26 (LZ21)	05:46 20:26
15	07:41 16:57	07:10 17:38	06:24 17:02 (LZ30)	06:28 19:52	07:02 (LZ21) 07:28 (LZ21)	05:45 20:27
16	07:40 16:58	07:08 17:40	06:22 17:11 (LZ30)	06:27 19:53	07:00 (LZ21) 07:28 (LZ21)	05:44 20:28
17	07:40 16:59	07:07 17:41	06:20 17:12 (LZ30)	06:25 19:54	06:59 (LZ21) 07:28 (LZ21)	05:43 20:29
18	07:39 17:00	07:05 17:42	06:18 17:14 (LZ30)	06:23 19:56	06:59 (LZ21) 07:29 (LZ21)	05:42 20:30
19	07:39 17:02	07:04 17:44	06:16 17:15 (LZ30)	06:22 19:57	06:58 (LZ21) 07:29 (LZ21)	05:41 20:31
20	07:38 17:03	07:02 17:45	06:15 17:15 (LZ30)	06:20 19:58	06:58 (LZ21) 07:30 (LZ21)	05:40 20:32
21	07:37 17:04	07:01 17:46	06:13 17:16 (LZ30)	06:18 17:42 (LZ22)	06:57 (LZ21) 07:29 (LZ21)	05:39 20:34
22	07:37 17:06	06:59 17:48	06:11 17:16 (LZ30)	06:17 17:33 (LZ22)	06:56 (LZ21) 07:29 (LZ21)	05:38 20:35
23	07:36 17:07	06:58 17:49	06:09 17:15 (LZ30)	06:15 17:30 (LZ22)	06:56 (LZ21) 07:29 (LZ21)	05:37 20:36
24	07:35 17:08	06:56 17:50	06:07 17:16 (LZ30)	06:14 17:29 (LZ22)	06:56 (LZ21) 07:28 (LZ21)	05:36 20:37
25	07:34 17:09	06:54 17:52	06:06 17:15 (LZ30)	06:12 17:27 (LZ22)	06:56 (LZ21) 07:28 (LZ21)	05:36 20:38
26	07:33 17:11	06:53 17:53	06:04 17:15 (LZ30)	06:10 17:26 (LZ22)	06:56 (LZ21) 07:27 (LZ21)	05:35 20:38
27	07:32 17:12	06:51 17:54	06:02 17:14 (LZ30)	06:09 17:24 (LZ22)	06:57 (LZ21) 07:27 (LZ21)	05:34 20:39
28	07:32 17:13	06:50 17:55	06:00 17:13 (LZ30)	06:07 17:23 (LZ22)	06:57 (LZ21) 07:25 (LZ21)	05:33 20:40
29	07:31 17:15		06:58 19:32	06:06 18:23 (LZ22)	06:58 (LZ21) 07:25 (LZ21)	05:33 20:41
30	07:30 17:16		06:56 19:33	06:04 18:23 (LZ22)	06:59 (LZ21) 07:24 (LZ21)	05:32 20:42
31	07:29 17:18		06:55 19:34	06:03 18:22 (LZ22)	05:31 20:43	
Potential sun hours	289	293	369	402	456	462
Total, worst case		272	287	758	70	
Sun reduction		0.29	0.31	0.40	0.47	
Oper. time red.		1.00	1.00	1.00	1.00	
Wind dir. red.		0.59	0.60	0.59	0.59	
Total reduction		0.17	0.18	0.24	0.28	
Total, real		46	53	178	19	

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZeM_03 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 85.1° Slope: 90.0° (50)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July	August	September	October	November	December
1	05:31 20:55	05:57 20:34	06:32 19:47	07:12 (LZ21) 07:18 (LZ21)	07:06 18:52	06:44 17:01
2	05:31 20:55	05:58 20:33	06:33 19:45	07:12 (LZ21) 18:50	07:07 18:50	06:45 17:00
3	05:32 20:55	05:59 20:32	06:34 19:43	18:27 (LZ22) 18:39 (LZ22)	07:08 18:49	06:47 16:59
4	05:32 20:55	06:00 20:30	06:35 19:42	18:24 (LZ22) 18:41 (LZ22)	07:09 18:47	06:48 16:57
5	05:33 20:55	06:01 20:29	06:36 19:40	18:22 (LZ22) 18:42 (LZ22)	07:10 18:45	06:49 16:56
6	05:33 20:54	06:02 20:28	06:37 19:38	18:20 (LZ22) 18:43 (LZ22)	07:12 18:43	06:51 16:55
7	05:34 20:54	06:03 20:26	06:38 19:36	18:18 (LZ22) 18:44 (LZ22)	07:13 18:41	06:52 16:54
8	05:35 20:54	06:05 20:25	06:40 19:34	18:17 (LZ22) 18:44 (LZ22)	07:14 18:40	06:53 16:52
9	05:36 20:53	06:06 20:24	06:41 19:33	18:16 (LZ22) 18:45 (LZ22)	07:15 18:38	06:55 16:51
10	05:36 20:53	06:07 20:22	06:42 19:31	18:15 (LZ22) 18:45 (LZ22)	07:16 18:36	06:56 16:50
11	05:37 20:52	06:08 20:21	06:43 19:29	18:14 (LZ22) 18:44 (LZ22)	07:18 18:34	06:57 16:49
12	05:38 20:52	06:09 20:19	06:44 19:27	18:14 (LZ22) 18:44 (LZ22)	07:19 18:33	06:59 16:48
13	05:39 20:51	06:10 20:18	06:45 19:25	18:14 (LZ22) 18:45 (LZ22)	07:20 18:31	07:00 16:47
14	05:39 20:50	06:11 20:16	06:46 19:23	18:14 (LZ22) 18:44 (LZ22)	07:21 18:29	07:01 16:46
15	05:40 20:50	06:12 20:15	06:47 19:22	18:14 (LZ22) 18:43 (LZ22)	07:23 18:28	07:03 16:45
16	05:41 20:49	06:14 20:13	06:49 19:20	18:14 (LZ22) 18:42 (LZ22)	07:24 18:26	07:04 16:44
17	05:42 20:48	06:15 20:12	06:50 19:18	18:14 (LZ22) 18:41 (LZ22)	07:25 18:24	07:05 16:43
18	05:43 20:48	06:16 20:10	06:51 19:16	18:14 (LZ22) 18:40 (LZ22)	07:26 18:23	07:06 16:42
19	05:44 20:47	06:17 20:09	06:52 19:14	18:15 (LZ22) 18:38 (LZ22)	07:27 18:21	07:08 16:41
20	05:45 20:46	06:18 20:07	06:53 19:12	18:16 (LZ22) 18:36 (LZ22)	07:29 18:19	07:09 16:40
21	05:46 20:45	06:19 20:05	06:54 19:11	18:18 (LZ22) 18:33 (LZ22)	07:30 18:18	07:10 16:39
22	05:47 20:44	06:20 20:04	06:55 19:09	18:22 (LZ22) 18:30 (LZ22)	07:31 18:16	07:12 16:39
23	05:48 20:43	06:21 20:02	06:57 19:07	18:30 (LZ22) 18:15	07:33 18:15	07:13 16:38
24	05:49 20:43	06:23 20:01	06:58 19:05	18:34 18:13	07:34 18:13	07:14 16:37
25	05:50 20:42	06:24 19:59	06:59 19:03	18:35 17:12	06:35 17:12	07:15 16:37
26	05:51 20:41	06:25 19:57	07:00 19:01	18:36 17:10	06:36 17:10	07:16 16:36
27	05:52 20:40	06:26 19:56	07:01 19:00	18:37 17:09	06:38 17:09	07:18 16:36
28	05:53 20:38	06:27 19:54	07:02 18:58	18:38 17:07	06:39 17:07	07:19 16:35
29	05:54 20:37	06:28 19:52	07:03 18:56	18:39 17:06	06:40 17:06	07:20 16:35
30	05:55 20:36	06:29 19:50	07:04 18:54	18:40 17:04	06:42 17:04	07:21 16:34
31	05:56 20:35	06:31 19:49	07:05 18:54	18:41 17:03	06:43 17:03	07:22 16:41
Potential sun hours	468	433	376	342	291	279
Total, worst case		617	487	303		
Sun reduction		0.65	0.59	0.47		
Oper. time red.		1.00	1.00	1.00		
Wind dir. red.		0.59	0.60	0.59		
Total reduction		0.38	0.36	0.28		
Total, real		235	174	84		

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)





SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZeM_04 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 74.0° Slope: 90.0° (67)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	January	February	March	April	May	June
1	07:44 16:42	07:28 17:19	06:48 17:57	06:53 19:35	06:03 19:13 (LZ22)	05:31 19:13 (LZ22)
2	07:44 16:43	07:26 17:20	06:46 17:58	06:51 19:36	06:02 20:12	05:30 20:45
3	07:44 16:44	07:25 17:22	06:45 17:59	17:22 (LZ30) 17:29 (LZ30)	06:49 19:38	05:30 20:45
4	07:44 16:45	07:24 17:23	06:43 18:01	17:19 (LZ30) 17:32 (LZ30)	06:47 19:39	05:29 20:46
5	07:44 16:46	07:23 17:24	06:41 18:02	17:16 (LZ30) 17:34 (LZ30)	06:46 19:40	05:29 20:47
6	07:44 16:47	07:22 17:26	06:39 18:03	17:14 (LZ30) 17:35 (LZ30)	06:44 19:41	05:29 20:48
7	07:43 16:48	07:21 17:27	06:38 18:04	17:13 (LZ30) 17:35 (LZ30)	06:42 19:42	05:28 20:48
8	07:43 16:49	07:19 17:29	06:36 18:06	17:13 (LZ30) 17:37 (LZ30)	06:40 19:44	05:28 20:49
9	07:43 16:50	07:18 17:30	06:34 18:07	17:12 (LZ30) 17:37 (LZ30)	06:39 19:45	05:28 20:50
10	07:43 16:51	07:17 17:31	06:32 18:08	17:11 (LZ30) 17:36 (LZ30)	06:37 19:46	05:27 20:50
11	07:42 16:52	07:15 17:33	06:31 18:09	17:11 (LZ30) 17:36 (LZ30)	06:35 19:47	05:27 20:51
12	07:42 16:53	07:14 17:34	06:29 18:11	17:10 (LZ30) 17:35 (LZ30)	06:33 19:48	05:27 20:51
13	07:42 16:54	07:13 17:35	06:27 18:12	17:11 (LZ30) 17:36 (LZ30)	06:32 19:50	05:27 20:52
14	07:41 16:56	07:11 17:37	06:25 18:13	17:11 (LZ30) 17:35 (LZ30)	06:30 19:51	05:27 20:52
15	07:41 16:57	07:10 17:38	06:24 18:14	17:12 (LZ30) 17:33 (LZ30)	06:28 19:52	05:27 20:53
16	07:40 16:58	07:08 17:40	06:22 18:16	17:13 (LZ30) 17:32 (LZ30)	06:27 19:53	05:27 20:53
17	07:40 16:59	07:07 17:41	06:20 18:17	17:14 (LZ30) 17:30 (LZ30)	06:25 19:54	05:27 20:54
18	07:39 17:00	07:05 17:42	06:18 18:18	17:17 (LZ30) 17:28 (LZ30)	06:23 19:56	05:27 20:54
19	07:39 17:02	07:04 17:44	06:16 18:19	06:22 19:57	05:41 20:31	05:27 20:54
20	07:38 17:03	07:02 17:45	06:15 18:21	06:20 19:58	05:40 20:32	05:27 20:55
21	07:37 17:04	07:01 17:46	06:13 18:22	06:18 19:59	05:39 20:34	05:27 20:55
22	07:37 17:06	06:59 17:48	06:11 18:23	06:17 20:00	05:38 20:35	05:27 20:55
23	07:36 17:07	06:58 17:49	06:09 18:24	06:15 20:01	05:37 20:36	05:28 20:55
24	07:35 17:08	06:56 17:50	06:07 18:25	06:14 20:03	05:36 20:37	05:28 20:55
25	07:34 17:09	06:54 17:52	06:06 18:27	06:12 20:04	05:36 20:38	05:28 20:56
26	07:33 17:11	06:53 17:53	06:04 18:28	06:10 20:05	05:35 20:38	05:28 20:56
27	07:32 17:12	06:51 17:54	06:02 18:29	06:09 20:06	05:34 20:39	05:29 20:56
28	07:32 17:13	06:50 17:55	06:00 18:30	06:07 20:07	05:33 20:40	05:29 20:56
29	07:31 17:15		06:58 19:32	06:06 20:09	05:33 20:41	05:30 20:56
30	07:30 17:16		06:56 19:33	06:04 20:10	05:32 20:42	05:30 20:56
31	07:29 17:18		06:55 19:34		05:31 20:43	
Potential sun hours	289	293	369	402	456	462
Total, worst case			321	505	843	143
Sun reduction			0.31	0.40	0.47	0.49
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.57	0.62	0.58	0.58
Total reduction			0.18	0.24	0.27	0.29
Total, real			56	123	231	41

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		



SHADOW - Calendar

Calculation: Real Case Shadow receptor: ZeM_04 - Shadow Receptor: 1.0 ? 1.0 Azimuth: 74.0° Slope: 90.0° (67)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VARNA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.61	3.03	3.64	5.32	6.89	7.61	8.86	9.04	7.43	5.21	3.54	2.37

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
1,100	811	599	537	466	626	951	657	457	913	862	781	8,760

	July			August			September			October			November		December	
1	05:31 20:55			05:57 20:34	29	06:33 (LZ21) 07:02 (LZ21)	06:32 19:47			07:06 18:52	25	17:50 (LZ30) 18:15 (LZ30)	06:44 17:01	07:22 16:34		
2	05:31 20:55	3	06:43 (LZ21) 06:46 (LZ21)	05:58 20:33	28	06:34 (LZ21) 07:02 (LZ21)	06:33 19:45			07:07 18:50	26	17:49 (LZ30) 18:15 (LZ30)	06:45 17:00	07:23 16:33		
3	05:32 20:55	7	06:42 (LZ21) 06:49 (LZ21)	05:59 20:32	27	06:34 (LZ21) 07:01 (LZ21)	06:34 19:43			07:08 18:49	25	17:49 (LZ30) 18:14 (LZ30)	06:47 16:59	07:25 16:33		
4	05:32 20:55	10	06:40 (LZ21) 06:50 (LZ21)	06:00 20:30	25	06:35 (LZ21) 07:00 (LZ21)	06:35 19:42			07:09 18:47	25	17:49 (LZ30) 18:14 (LZ30)	06:48 16:57	07:26 16:33		
5	05:33 20:55	11	06:40 (LZ21) 06:51 (LZ21)	06:01 20:29	23	06:37 (LZ21) 07:00 (LZ21)	06:36 19:40			07:10 18:45	25	17:49 (LZ30) 18:14 (LZ30)	06:49 16:56	07:27 16:33		
6	05:33 20:54	14	06:39 (LZ21) 06:53 (LZ21)	06:02 20:28	21	06:38 (LZ21) 06:59 (LZ21)	06:37 19:38			07:12 18:43	24	17:49 (LZ30) 18:13 (LZ30)	06:51 16:55	07:28 16:32		
7	05:34 20:54	15	06:38 (LZ21) 06:53 (LZ21)	06:03 20:26	21	06:39 (LZ21) 19:12 (LZ22)	06:38 19:36			07:13 18:41	21	17:50 (LZ30) 18:11 (LZ30)	06:52 16:54	07:29 16:32		
8	05:35 20:54	17	06:38 (LZ21) 06:55 (LZ21)	06:05 20:25	28	06:40 (LZ21) 19:17 (LZ22)	06:40 19:34			07:14 18:40	20	17:50 (LZ30) 18:10 (LZ30)	06:53 16:52	07:30 16:32		
9	05:36 20:53	18	06:38 (LZ21) 06:56 (LZ21)	06:06 20:24	27	06:43 (LZ21) 19:19 (LZ22)	06:41 19:33			07:15 18:38	16	17:52 (LZ30) 18:08 (LZ30)	06:55 16:51	07:31 16:32		
10	05:36 20:53	20	06:36 (LZ21) 06:56 (LZ21)	06:07 20:22	20	19:00 (LZ22) 19:20 (LZ22)	06:42 19:31			07:16 18:36	12	17:54 (LZ30) 18:06 (LZ30)	06:56 16:50	07:32 16:32		
11	05:37 20:52	21	06:36 (LZ21) 06:57 (LZ21)	06:08 20:21	23	18:59 (LZ22) 19:22 (LZ22)	06:43 19:29			07:18 18:34			06:57 16:49	07:32 16:32		
12	05:38 20:52	22	06:36 (LZ21) 06:58 (LZ21)	06:09 20:19	24	18:58 (LZ22) 19:22 (LZ22)	06:44 19:27			07:19 18:33			06:59 16:48	07:33 16:32		
13	05:39 20:51	23	06:36 (LZ21) 06:59 (LZ21)	06:10 20:18	27	18:56 (LZ22) 19:23 (LZ22)	06:45 19:25			07:20 18:31			07:00 16:47	07:34 16:32		
14	05:39 20:50	24	06:35 (LZ21) 06:59 (LZ21)	06:11 20:16	29	18:55 (LZ22) 19:24 (LZ22)	06:46 19:23			07:21 18:29			07:01 16:46	07:35 16:32		
15	05:40 20:50	26	06:34 (LZ21) 07:00 (LZ21)	06:12 20:15	30	18:54 (LZ22) 19:24 (LZ22)	06:47 19:22			07:23 18:28			07:03 16:45	07:36 16:32		
16	05:41 20:49	26	06:34 (LZ21) 07:00 (LZ21)	06:14 20:13	30	18:54 (LZ22) 19:24 (LZ22)	06:49 19:20			07:24 18:26			07:04 16:44	07:37 16:33		
17	05:42 20:48	27	06:34 (LZ21) 07:01 (LZ21)	06:15 20:12	31	18:53 (LZ22) 19:24 (LZ22)	06:50 19:18			07:25 18:24			07:05 16:43	07:37 16:33		
18	05:43 20:48	28	06:34 (LZ21) 07:02 (LZ21)	06:16 20:10	32	18:52 (LZ22) 19:24 (LZ22)	06:51 19:16			07:26 18:23			07:06 16:42	07:38 16:33		
19	05:44 20:47	28	06:34 (LZ21) 07:02 (LZ21)	06:17 20:09	32	18:53 (LZ22) 19:25 (LZ22)	06:52 19:14			07:27 18:21			07:08 16:41	07:39 16:34		
20	05:45 20:46	29	06:34 (LZ21) 07:03 (LZ21)	06:18 20:07	32	18:53 (LZ22) 19:25 (LZ22)	06:53 19:12			07:29 18:19			07:09 16:40	07:39 16:34		
21	05:46 20:45	30	06:33 (LZ21) 07:03 (LZ21)	06:19 20:05	32	18:52 (LZ22) 19:24 (LZ22)	06:54 19:11			07:30 18:18			07:10 16:39	07:40 16:34		
22	05:47 20:44	31	06:32 (LZ21) 07:03 (LZ21)	06:20 20:04	32	18:52 (LZ22) 19:24 (LZ22)	06:55 19:09			07:31 18:16			07:12 16:39	07:40 16:35		
23	05:48 20:43	31	06:32 (LZ21) 07:03 (LZ21)	06:21 20:02	31	18:52 (LZ22) 19:23 (LZ22)	06:57 19:07			07:33 18:15			07:13 16:38	07:41 16:35		
24	05:49 20:43	31	06:32 (LZ21) 07:03 (LZ21)	06:23 20:01	30	18:52 (LZ22) 19:22 (LZ22)	06:58 19:05			07:34 18:13			07:14 16:37	07:41 16:36		
25	05:50 20:42	31	06:32 (LZ21) 07:03 (LZ21)	06:24 19:59	29	18:52 (LZ22) 19:21 (LZ22)	06:59 19:03	9	18:00 (LZ30)	06:35 17:12			07:15 16:37	07:42 16:37		
26	05:51 20:41	32	06:32 (LZ21) 07:04 (LZ21)	06:25 19:57	27	18:53 (LZ22) 19:20 (LZ22)	07:00 19:01	15	17:57 (LZ30) 18:12 (LZ30)	06:36 17:10			07:16 16:36	07:42 16:37		
27	05:52 20:40	32	06:32 (LZ21) 07:04 (LZ21)	06:26 19:56	25	18:54 (LZ22) 19:19 (LZ22)	07:01 19:00	18	17:55 (LZ30) 18:13 (LZ30)	06:38 17:09			07:18 16:36	07:42 16:38		
28	05:53 20:38	32	06:32 (LZ21) 07:04 (LZ21)	06:27 19:54	23	18:54 (LZ22) 19:17 (LZ22)	07:02 18:58	21	17:53 (LZ30) 18:14 (LZ30)	06:39 17:07			07:19 16:35	07:43 16:39		
29	05:54 20:37	30	06:33 (LZ21) 07:03 (LZ21)	06:28 19:52	19	18:56 (LZ22) 19:15 (LZ22)	07:03 18:56	23	17:52 (LZ30) 18:15 (LZ30)	06:40 17:06			07:20 16:35	07:43 16:39		
30	05:55 20:36	30	06:33 (LZ21) 07:03 (LZ21)	06:29 19:50	14	18:58 (LZ22) 19:12 (LZ22)	07:05 18:54	24	17:51 (LZ30) 18:15 (LZ30)	06:42 17:04			07:21 16:34	07:43 16:40		
31	05:56 20:35	30	06:33 (LZ21) 07:03 (LZ21)	06:31 19:49	5	19:02 (LZ22) 19:07 (LZ22)				06:43 17:03				07:43 16:41		
Potential sun hours	468			433			376			342			291	279		
Total, worst case	709			806			110			219						
Sun reduction	0.59			0.65			0.59			0.47						
Oper. time red.	1.00			1.00			1.00			1.00						
Wind dir. red.	0.58			0.61			0.57			0.57						
Total reduction	0.34			0.39			0.34			0.27						
Total, real	241			316			37			59						

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		